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Ventura V-Diag - End user

Software User Documentation

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Revision history

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2	2018-11-30	Prepared: <i>M.S. Delorme</i>	Spelling check Updated software version. Improved document layout.
1	2018-08-28	Prepared: <i>M.S. Delorme</i>	Initial version



Preface

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Table of Contents

1 Introduction.....	7
1.1 Purpose.....	7
1.2 Scope	7
1.3 Definitions	7
1.4 Acronyms and Abbreviations	7
1.5 References.....	8
1.5.1 External documents.....	8
1.5.2 Ventura Systems documents	8
1.6 Software versions.....	8
1.7 Overview.....	8
2 System requirements.....	9
3 Installation of V-Diag.....	10
3.1 Delivery on a USB Flash Drive.....	10
3.2 Automatic update	10
4 User interface description	11
4.1 Identify ECU.....	12
4.1.1 Tab header icons.....	13
4.1.2 Controls	13
4.2 Diagnostics bus communication	14
4.2.1 Controls and options	14
4.2.2 Displayed columns.....	14
4.3 Read ECU input/outputs.....	15
4.3.1 Controls and options	15
4.3.2 Text and background color.....	15
4.4 Read/Write EEPROM	16
4.4.1 Controls and options	16
4.5 Read/Clear DTC	17
4.5.1 Controls and options	17
4.6 Package deployment.....	18
4.6.1 Controls	18
4.7 Oscilloscope.....	20
4.7.1 Controls and options	20
Appendix A - Trouble shooting	22
Appendix B - Contact.....	23
Appendix C - PCAN View Tracing	24

List of Figures

Figure 1: V-diag automatic update notification window.....	10
Figure 2: Download V-diag update window.....	10
Figure 3: V-diag main window	11
Figure 4: Menu bar	11
Figure 5: Identify ECU window	12
Figure 6: Tab header	13
Figure 7: Diagnostic bus communication window.....	14
Figure 8: Read I/O window	15
Figure 9: Read/Write EEPROM window	16
Figure 10: Read/Clear DTCs window	17
Figure 11: Deploy package window.....	18
Figure 12: Settings window.....	20
Figure 13: Oscilloscope window	20
Figure 14: World map Ventura locations	23
Figure 15: Find PCAN-View	24
Figure 16: Connection settings.....	24
Figure 17: Trace settings.....	25
Figure 18: Start trace.....	25
Figure 19: Stop trace.....	26

Figure 20: Save trace file.....26

List of Tables

Table 1: Definitions7
Table 2: Acronyms and Abbreviations.....7
Table 3: External documents8
Table 4: Ventura Systems documents.....8
Table 5: V-diag software version8
Table 6: Supported ECU applications8
Table 7: Menu items11
Table 8: Menu bar icons.....11
Table 9: Identify ECU action icons13
Table 10: General contact information23
Table 11: Parts contact information.....23

1 Introduction

1.1 Purpose

This document gives an overview of how to use V-Diag. The intended audience is the Ventura Systems employees, customers of Ventura Systems and end users of Ventura ECUs.

1.2 Scope

Ventura Systems V-Diag is the diagnostic tool created by Ventura Systems to perform diagnostics on systems equipped with an Ventura ECU. V-Diag is a Windows application, using a PCAN-USB CAN Bus interface to communicate with the a Ventura ECU.

Using V-Diag it is possible to:

- Read parameter settings from an ECU and write to a file;
- Write parameter settings from an ECU from a file;
- Edit parameter settings online in an ECU;
- Read out the status messages sent by a DCU on the VDN;
- Detect ECUs on a CAN network, thereby checking the address, versions and basic parameter settings of the ECU;
- Read values from ECU in- and outputs;

This manual provides the following:

- The system requirements for V-Diag;
- An installation manual for V-Diag;
- An explanation of the buttons in V-Diag. They will be explained using screen shots;
- A guide step-by-step guide through some of the most common tasks performed using V-Diag.

This manual will not provide:

- An explanation of the parameters in the different ECU software variants;
- An explanation of the meaning of variables in the status windows;
- An installation manual for the PCAN-USB drivers.

1.3 Definitions

Definition	Description
Variant	In the context of the Ventura DCU a variant mainly defines the CAN protocol used (if any) and select specific variant specific input and outputs.
Gateway/Host network topology	CAN network wherein one DCU has a CAN connection (gateway) with the multiplex of the bus and other DCUs(hosts) are connected to the gateway using a separate Ventura DCU network
Gateway/Gateway network topology	CAN network wherein every DCU has a direct connection with the multiplex of the bus.
Ventura Doors Network	DCU network used in Gateway/Host network topology.

Table 1: Definitions

1.4 Acronyms and Abbreviations

Abbreviation	Description
BSP	Board Support Package
CAN	Controller Area Network
CPU	Central Processing Unit
DCU	Door Control Unit
DTC	Diagnostic Trouble Code
ECU	Electronic Control Unit
EEPROM	Electrically Erasable Programmable Read-Only Memory
IATF	International Automotive Task Force
ISO	International Standardization Organization
LED	Light Emitting Diode
PCAN	Peak-CAN
PDF	Portable Document Format
RAM	Random Access Memory
VDN	Ventura DCU network
VDU	Ventura DCU software package file
UDS	Unified Diagnostic Services
USB	Universal Serial Bus

Table 2: Acronyms and Abbreviations

1.5 References

1.5.1 External documents

Reference	Description	Date
IATF 16949:2016	Automotive quality management system standard	2016-10-01
ISO 14001:2015	Environmental management systems – Requirements with guidance for use	2015-10-01
ISO 9001:2015	ISO Standard for Quality Management Systems – Requirements.	2015-10-01

Table 3: External documents

1.5.2 Ventura Systems documents

Reference	Type	Description	Revision	Date
QM000001	DG	Documentation Guideline	4.1	2022-03-16

Table 4: Ventura Systems documents

1.6 Software versions

This document is based on the following software version:

Item	Version	Developer	Reference
V-Diag	2.24	Ventura Systems	VA6311

Table 5: V-diag software version

V-diag supports diagnostics for the following ECU Software applications.

ECU Application	Highest supported version
DCU Application	3.5.7
E-Ramp Application	0.1.1

Table 6: Supported ECU applications

1.7 Overview

The list below shows a brief overview of the contents each chapter:

1. Gives an introduction, definitions and overview of this document.
2. Contains the system requirements.
3. Explains the installation procedure of V-Diag.
4. Contains the User interface description.

Overview of the appendices:

- A. Contact information.
- B. Description of how to make CAN trace files with PCAN view.

2 System requirements

V-Diag has the following requirements to the hardware:

- Core 2 Duo T7300 or better CPU (Core i3 or better recommended).
- 3GB of RAM or more.
- Peak System PCAN-USB or PCAN-PCCARD CAN interface (included in hardware kit).
- Screen resolution 1280*800 or higher (1600*900 or higher recommended).

V-Diag has the following requirements to the software:

- Windows 10 (32-bit or 64-bit) or higher.
- .NET Framework V4.0 installed.
- Peak System PCAN Drivers installed (included on Flash Drive in hardware kit).

A complete kit consisting of the hardware can be ordered at Ventura Systems Parts department.

3 Installation of V-Diag

V-Diag is a simple application that is not bound to a specific location on your system and does not require access to the registry. V-Diag can be supplied in two different ways:

- On a USB Flash Drive with the hardware kit;
- As an automatic update;

3.1 Delivery on a USB Flash Drive

When V-Diag is delivered on the USB Flash Drive as part of the hardware kit, the installation of the software is simplified by the setup program. This program lets the user choose the location to install V-Diag and it creates start menu shortcuts in the folder 'Ventura Systems'.

3.2 Automatic update

At startup, V-Diag automatically checks for updates and informs the users when an update is available as show in the figure below.

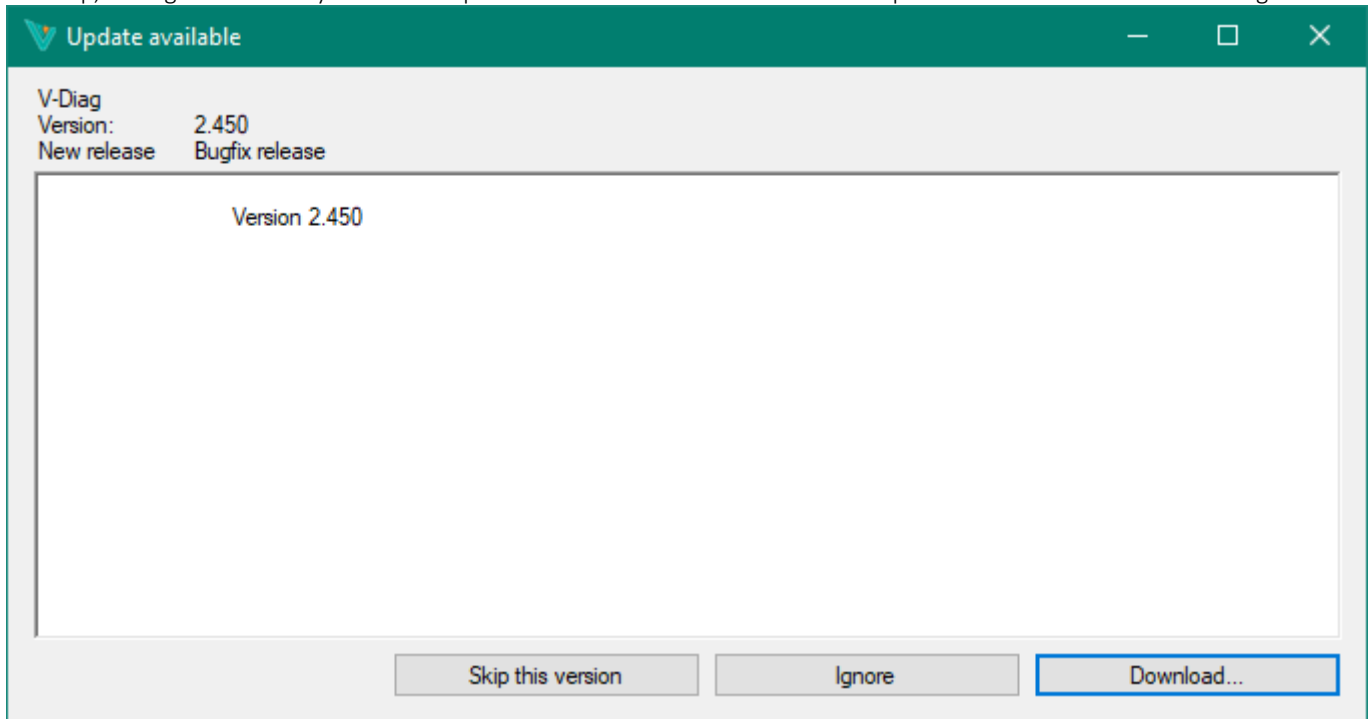


Figure 1: V-diag automatic update notification window

The user can choose to ignore this update now, skip this update and to download. When the user skips the version, V-Diag will not ask again to update to this version. Check for updates can be manually started under help in the menu bar.

After downloading the update, there are two choices as show in the figure below: Install and restart now or Manually install later. When choosing 'Install and restart' it will start the installer and shut itself down.

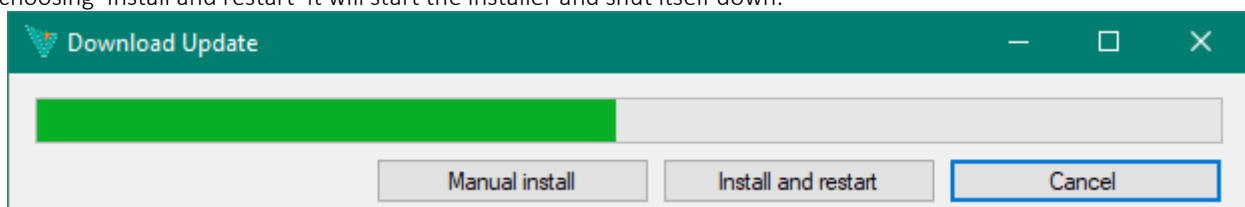


Figure 2: Download V-diag update window

When choosing 'Manual install', V-Diag will ask for a location to save the installer and it will continue to function. This can be useful to update a larger number of workstations which do not have Internet access.

4 User interface description

The figure below shows the basic user interface. This is the main window shown when V-Diag is opened.

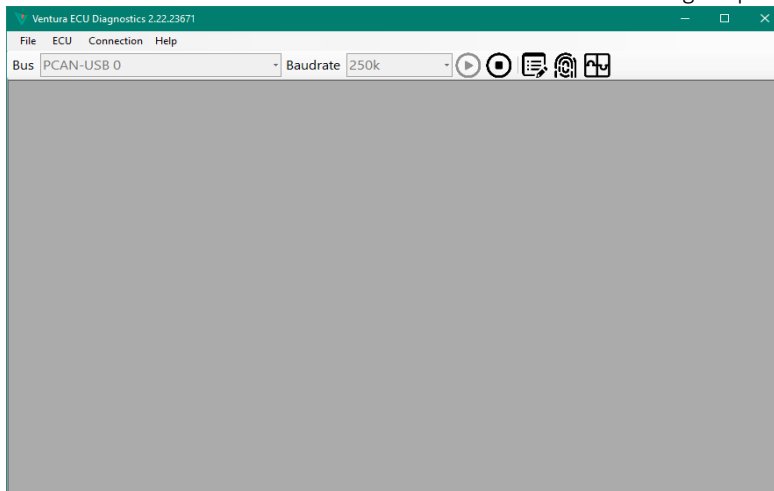


Figure 3: V-diag main window

The title bar of the main window shows the current version of V-Diag. The version number of V-Diag is displayed in the title bar. The main window contains the area in which the sub-windows are displayed. The menu bar contains a number of menus to control the V-Diag application.

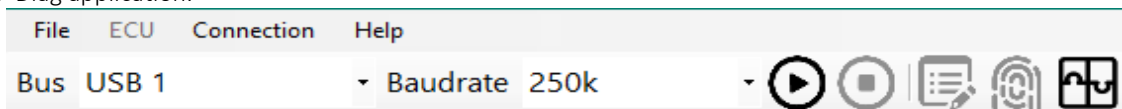


Figure 4: Menu bar


Menu item	Function
File	Used to open the settings or to Quit V-Diag
ECU	Open the different forms to perform all the diagnostic actions available in V-Diag
Connection	Used for operations on the connection: Connect, Disconnect, Connect with Trace
Help	Version info of the application and open of various documents.

Table 7: Menu items

Icon	Function
	Select the bus to which the ECU is connected
	Select the baud-rate the ECU uses (std: 250k)
	Connect
	Disconnect
	Offline edit of parameters for a specific application version.
	Detect ECUs on the network, read software version and basic parameter settings
	Combine packages for multiple doors in a vehicle.

Table 8: Menu bar icons

4.1 Identify ECU

Using the Identify ECU functionality , V-Diag can detect the ECUs that are connected to the CAN-network and read out application version information and a number of configuration parameters to quickly identify the configured application type and CAN bus settings. Also the parameter lock status is shown. When it indicates that the configuration is locked the parameter configuration can't be edited.

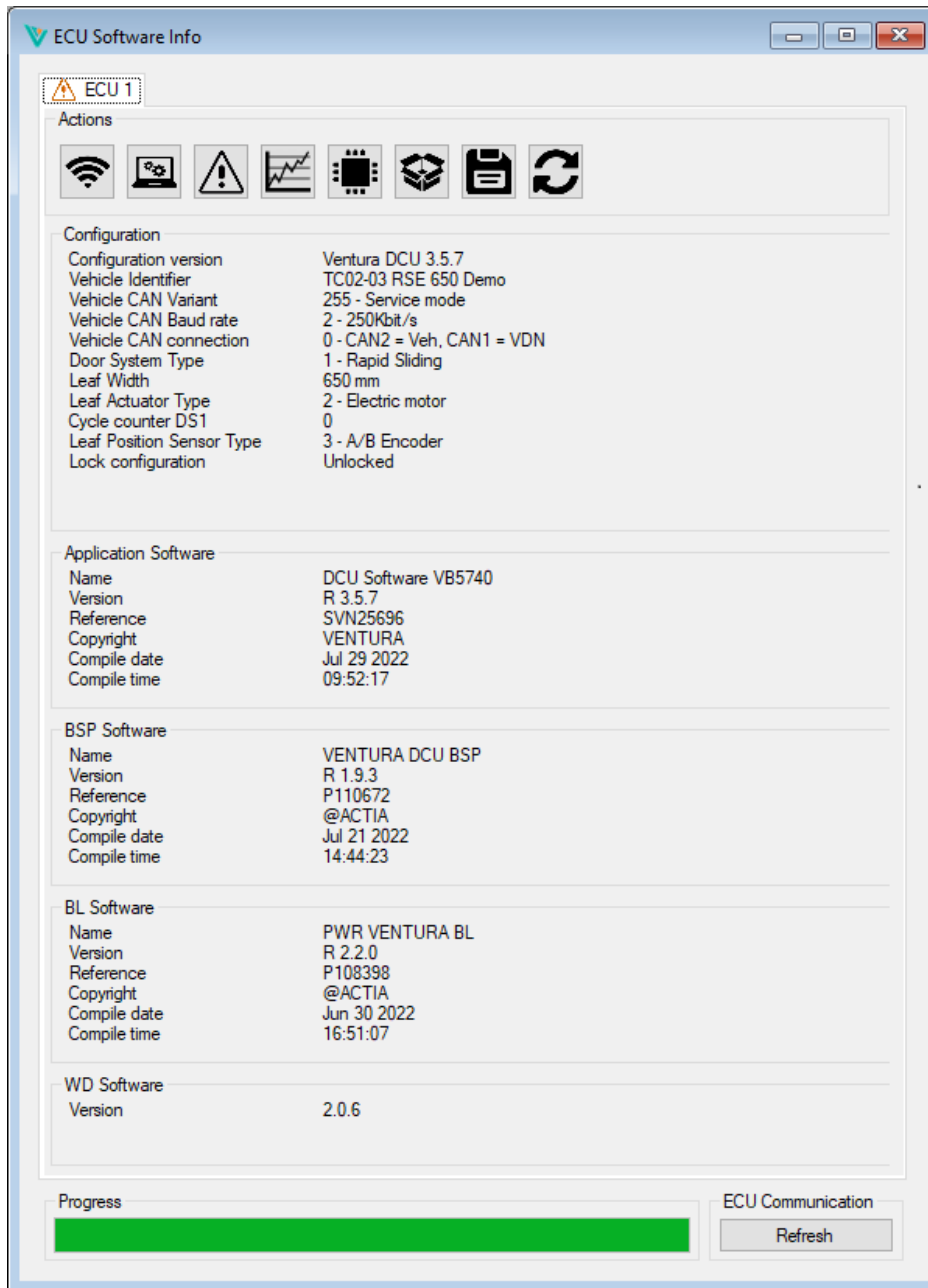


Figure 5: Identify ECU window

4.1.1 Tab header icons

The tab header shows the detected ECUs:

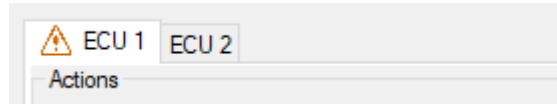



Figure 6: Tab header

The icon  in the tab header indicates that there are one or more active DTCs in the ECU.

4.1.2 Controls

The Identify ECU window has the following controls:

- Tab bar with ECU numbers: This indicates the detected ECUs and their network address as it is configured through the address lines;
- Overview of current configuration;
- Overview of current software versions;
- Progress bar: Shows the detection and reading progress.
- Possible actions that can be performed on the ECU:










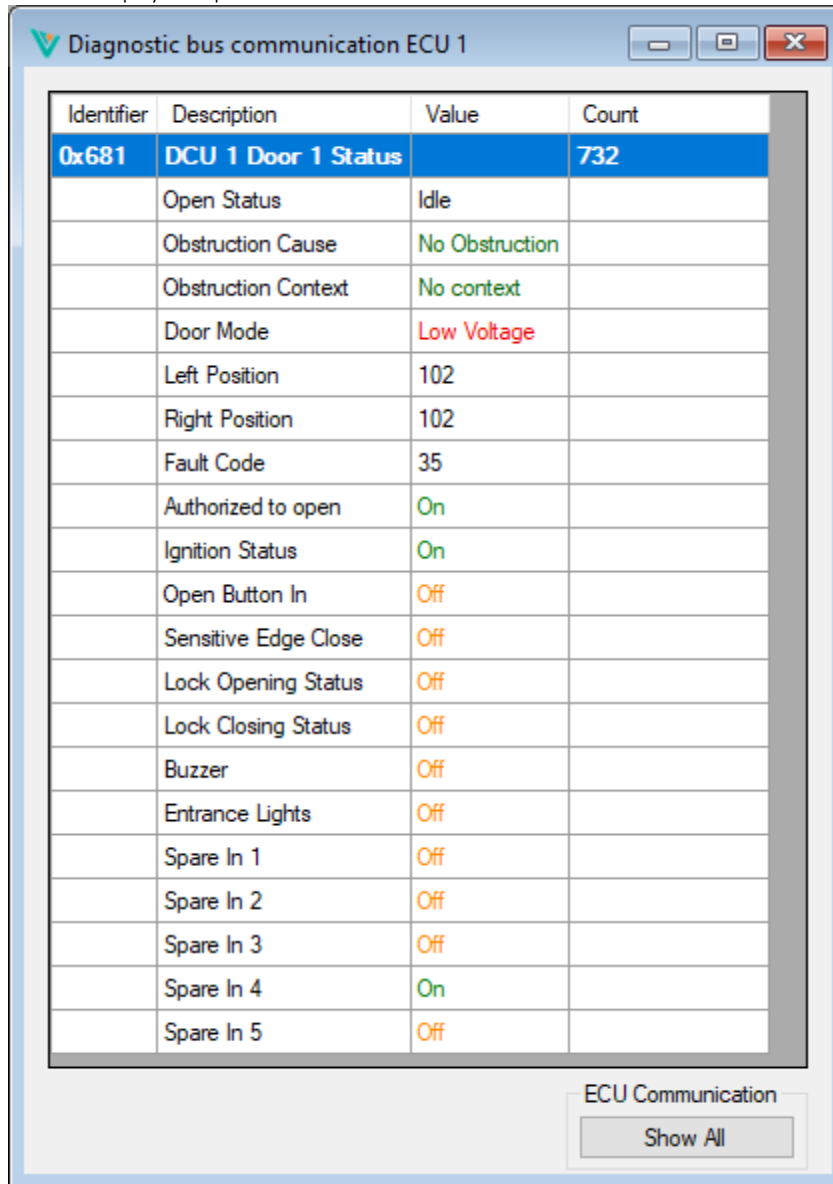
Icon	Description
	Monitor VDN messages from a DCU and display them in a human readable way. Only visible when the application is the DCU application and VDN network is used.
	Read several I/O statuses from the ECU and display them in a human readable way
	Read / clear DTC (Diagnostic Trouble Code) from the ECU.
	Open the oscilloscope.
	Read/Write EEPROM areas.
	Deploy package.
	Save identification information in PDF format.
	Restart the ECU.

Table 9: Identify ECU action icons

4.2 Diagnostics bus communication

When clicking the WiFi-symbol  in the tool-bar, the 'Diagnostics bus communication' appears. Using this functionality, it is possible to receive the status and command messages the DCU uses internally and display them in a human readable way. The example in Figure below shows the status messages from the first DCU. The status of inputs can be displayed, the door mode, obstruction status and the door position can be displayed. The way the information is displayed depends on the ECU configuration.

Using this functionality, it is possible to diagnose certain issues: Do the input statuses correspond to what happens at the door? Does the position correspond to the physical position of the door leaves?



Identifier	Description	Value	Count
0x681	DCU 1 Door 1 Status		732
	Open Status	Idle	
	Obstruction Cause	No Obstruction	
	Obstruction Context	No context	
	Door Mode	Low Voltage	
	Left Position	102	
	Right Position	102	
	Fault Code	35	
	Authorized to open	On	
	Ignition Status	On	
	Open Button In	Off	
	Sensitive Edge Close	Off	
	Lock Opening Status	Off	
	Lock Closing Status	Off	
	Buzzer	Off	
	Entrance Lights	Off	
	Spare In 1	Off	
	Spare In 2	Off	
	Spare In 3	Off	
	Spare In 4	On	
	Spare In 5	Off	

ECU Communication
Show All

Figure 7: Diagnostic bus communication window

4.2.1 Controls and options


Receive status messages has the following controls and options:

- Show all: Display messages from all DCUs.

4.2.2 Displayed columns

- Identifier: The identifier of the received CAN Bus message;
- Description: The description of the message and variables in the message;
- Value: The value, translated into a meaningful representation;
- Count: The message counter. Counts up when messages are received.

4.3 Read ECU input/outputs

Using the Read I/O  functionality of V-Diag, it is possible to read physical signals and various internal signals from the ECU. For example, it is possible to read the temperature of the ECU, the battery voltage and the ignition voltage. Additionally V-Diag is also able to read out internal states of the ECU software like door mode or obstruction cause and context. Which values are read, is entirely dependent on the ECU configuration and the ECU Application Software.

Name	Value
Open Status	2 - Idle
Obstruction - Cause	0 - No Obstruction
Obstruction - Context	0 - No context
Door Mode	12 - Low Voltage
Left Position	-1 mm
Potentiometer Voltage Left	2,7 V
Right Position	0 mm
Potentiometer Voltage Right	2,7 V
Active fault code	109
Authorization - Authorized to open	On
Sensitive Edge 1	Error
Open Button State	Off
Close Button State	Off
Workshop Button State	Off
Door Block Input State	Off
Left leaf timing - Opening	0 s
Left leaf timing - Closing	0 s
Right leaf timing - Opening	0 s
Right leaf timing - Closing	0 s
Temp DCU	29 ° C
VAMS	28 V
VBat	28,1 V
V1	4,6 V
Sensor Supply 1 Voltage	15,5 V
Sensor Supply 2 Voltage	15,6 V

Parameter Group: Door Information
 DCU Communication: Restart

Figure 8: Read I/O window

4.3.1 Controls and options

Reading I/O has the following options and controls:


- Parameter group: Selection of a group of signals, the available groups and signals in the groups depend on the ECU configuration.
- Restart button: Restart reading of the signals after a time out or disconnect occurred.

4.3.2 Text and background color

The text or background is colored on some of the fields to make the signals more readable and identifiable if something is out of order. The colors are predefined and depend on the value gathered from the signals. As a general rule of thumb the colors indicate:

- Green - Signal active, above activation threshold or in operating range.
- Yellow/Orange - Signal inactive or below activation threshold.
- Red - Signal in error state.
- Purple - Signal out of operating range.

4.4 Read/Write EEPROM

Using the read/write EEPROM functionality , it is possible to read parameters from an ECU and write them to a file or to read parameters from a file and write them to the ECU in a binary format. This ensures that parameters are exactly equal to those of the ECU they have been extracted from.

When reading the parameters from the ECU is finished, a Save File Dialog is displayed, allowing the user to save parameters that are read from the ECU to any desired location.

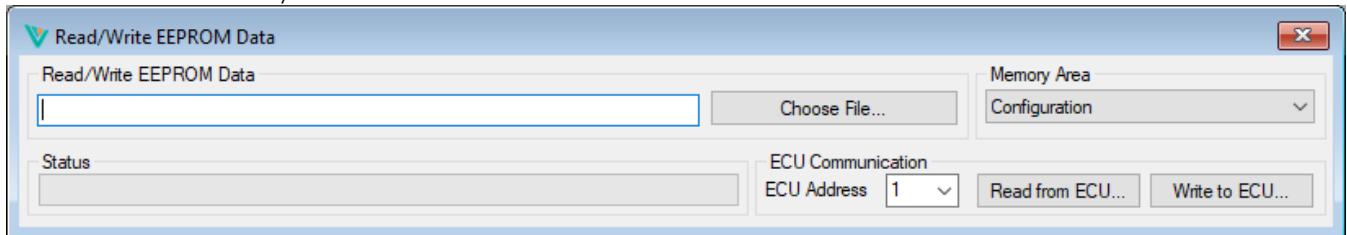


Figure 9: Read/Write EEPROM window

4.4.1 Controls and options

The read/write parameters window has the following controls and options:

- File path box: Shows the full path to the file where the parameters are read from or have been written to;
- Choose file: Choose the file from which the parameters are read. Only used when writing parameters to the ECU;
- Memory Area: The memory area to read from. When writing, the memory area is chosen based on file contents;
- Read from ECU : Read all parameters from ECU and write to file;
- Write to ECU: Write all parameters from the selected file;
- Progress bar: To monitor the progress of writing parameters.

4.5 Read/Clear DTC

The Ventura ECU stores error codes when an error situation occurs, also known as ‘Diagnostic Trouble Codes’. These codes can be used to diagnose a malfunctioning door, and could help to find the root cause as to why the door malfunctions. The DTCs are presented in a list where:

- Active: Indicates if a fault is currently active.
- DTC: The trouble shooting code.
- Description: A short description of the fault.
- Class: Classification of the fault (Minor/Major).
- Occurrences: The amount of times the fault occurred.
- First cycle count: The open/close cycle where the fault occurred for the first time.
- Ignition: Ignition was active when fault occurred.
- Authorized: Authorized to open was active when fault occurred

When a DTC is selected in the list a detailed description of the DTC is shown including symptoms and possible causes.

Usage of the Read/Clear DTC function of V-Diag (⚠) includes reading/refreshing the list of DTCs with the "Read" button, clearing DTCs with the "Clear" button and saving the DTCs in a PDF file with the "Save..." button.

Active	DTC	Description	Class	Occurrences	First Cycle Count	Ignition	Authorized
<input type="checkbox"/>	13	End switch unreliable (Close direction)	Major	1	0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	31	Motor left open load	Major	1	0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	91	VBat below 19 V	Major	1	0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	93	V1 below 19 V	Major	1	0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	95	VAMS below 19 V	Major	1	0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	109	Invalid loss of closed position	Major	4	0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	147	Sensitive edge left interrupted	Minor	1	0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	174	Modified configuration	Minor	3	0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

DTC 13 - End switch unreliable (Close direction)
End switch input not activated when pulse count is near to close reference

Symptoms
Door moves in slow speed only, as position information is unknown, but speed is measurable.

Possible causes
Broken wire, defective switch, badly adjusted cam, bad contacts, unplugged. Check CN3:9

DTC file ECU Communication

Figure 10: Read/Clear DTCs window

4.5.1 Controls and options


The read/clear DTC window has the following controls and options:

- Select a DTC: Show the detailed description of the DTC including symptoms and possible causes.
- Read button: Read the DTCs from the ECU.
- Clear button: Clear all DTCs on the ECU. After clearing is finished, V-Diag will automatically read the DTCs from the ECU.
- Save button: Save all DTCs from the ECU to a PDF-report.

4.6 Package deployment

NOTICE

Do not turn off the power during the deployment of the ECU software package.

Using the deployment functionality of V-Diag (), it is possible to deploy prepared packages to an ECU. Packages contain software updates, parameter updates and boot loader updates. All that needs to be done is selecting a .VDU file, selecting the targets and clicking 'Start'. V-Diag will then start the deployment process and display the progress. When the deployment is successful, this will be reported. When the deployment fails, this will be reported, including the reason for the failure.

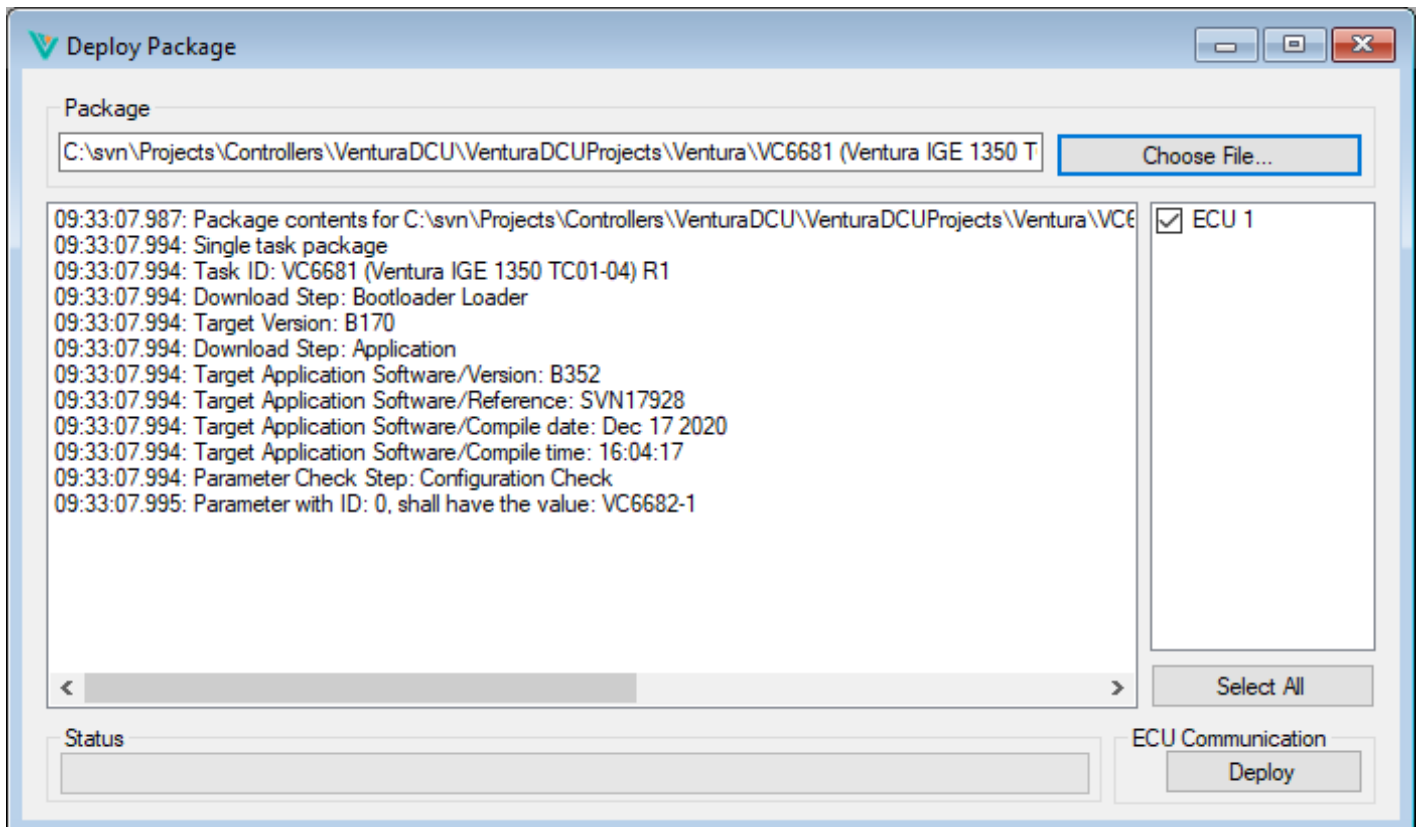


Figure 11: Deploy package window

NOTICE

A calibrate sequence needs to be performed after an ECU software package is deployed.

4.6.1 Controls


The Deploy Package window has the following controls:

- Text-box: Contains the path to the .VDU file containing the software. A path can be entered or pasted directly;
- Browse button: Opens a file selection dialog to select a .VDU file. The path will be automatically entered into the text-box;
- Progress window: Displays all the steps in the deployment process;
- Progress bar: Displays the progress percentage of the deployment process;
- ECU list: Selects the ECU to deploy to;
- Select All button: Selects all ECUs in the list;
- Deploy button: Starts the deployment process.



Note : When the deployment sequence has been aborted the deployment of the package can be retried. However if the ECU can no longer be reached on the expected address, it might be required to perform a recovery procedure. Contact Ventura service for instructions.

4.7 Oscilloscope

Using the Oscilloscope functionality , signals from the ECU can be tracked live in a selective and visual way. Up to 4 signals can be selected to track and visualize. The tracked signals can be saved as .csv(comma-separated values) files.

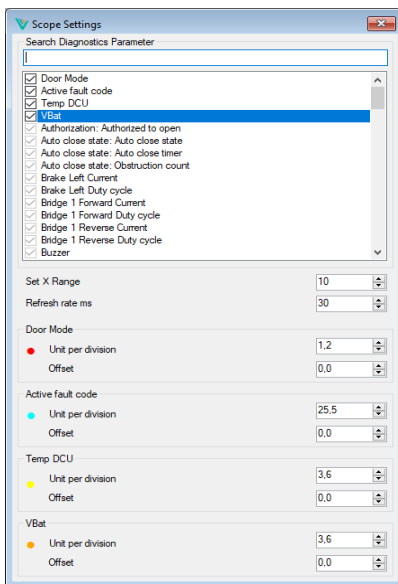


Figure 12: Settings window

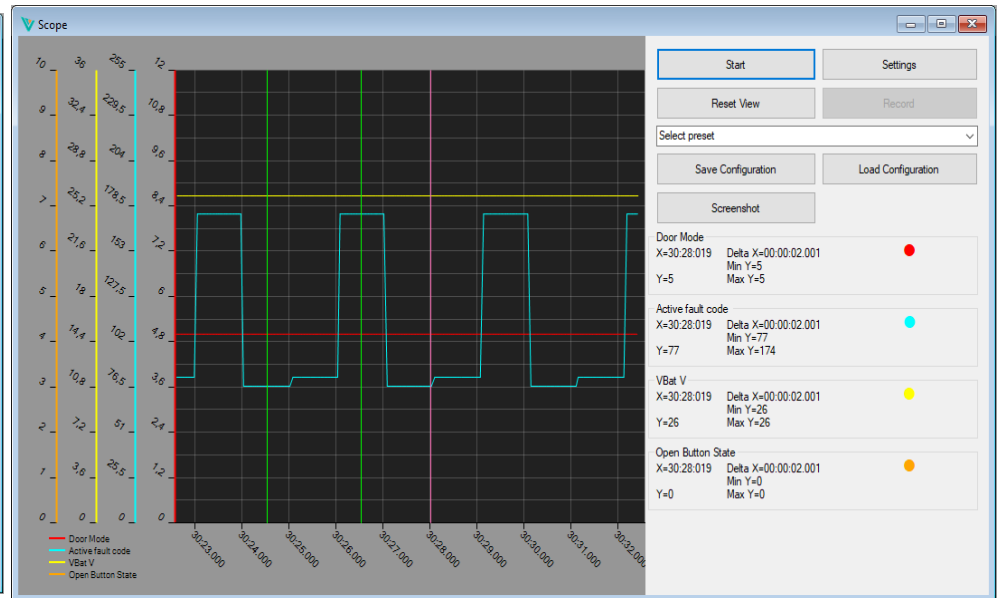


Figure 13: Oscilloscope window

4.7.1 Controls and options

The oscilloscope has the following controls and options:

- The settings window contains the following controls:
 - Search box: The search box can be used to find signals based on name.
 - Signal selection box: The Signal box contains all the available signals which you can select by clicking on them.
 - Set X range box: The set X range box can be used to set the time visible in the graph in seconds.
 - Refresh rate ms (30ms - 1000ms): The time between each refresh interval. Each interval will refresh all the selected signals.
 - Signal box: The signal boxes (max 4) containing the unit per division and offset numeric boxes of the respective Y axis.
- The oscilloscope window contains the following controls:
 - Start/Stop button: The start/stop button can be used to start and stop the tracking, if you change the selected signals you will need to restart the tracking.
 - Settings button: The settings button can be used to open the settings window, only one settings window can be open at all times. Clicking this button when a settings window is made already will bring the old one to the front.
 - Reset view button: The reset view button can be used to reset the view of the graph, meaning that the X axis will be reset so the graph lines are in the middle of the screen.
 - Record button: The record button can be used to start the saving of the signal data of all selected signals. When clicked this will open a standard save dialog.
 - Preset dropdown list: In the dropdown list there are a couple of predefined configurations. When selecting a preset, the configuration will automatically be loaded.
 - Save configuration button: The save configuration button is used to save the currently selected signals and save them in an .vds file. When clicked this will open a standard save dialog.
 - Load configuration button: The load configuration button is used to load a set of signals from an .vds file. When clicked this will open a standard load dialog.
 - Signal boxes: On the graph window there will be a maximum of 4 signal boxes containing the following data about the respective signal:
 - Name: Each signal box will have the name and the unit of measure of the respective signal.
 - X coordinate of the cursor: By moving the mouse over the graph a cursor will be shown on the position of your pointer this coordinate will be shown.
 - Y coordinate at the cursor: Based on the X coordinate this will display the closest points Y value.
 - Delta X: When setting static cursors this will display the distance between the two cursors.
 - Minimum Y value: This will display the minimum Y value between the two static cursors.
 - Maximum Y value: This will display the maximum Y value between the two static cursors.



- Colored circle: This will display the color of the line and the connected Y axis.
- Refresh-rate: This will display the refresh-rate at which the respective signal is refreshed.
- The oscilloscope contains the following controls:
 - Scrolling: By holding the SHIFT button and dragging the graph left or right you can scroll through the data, click reset view to re-enable automatic scrolling.
 - Zooming X axis: By holding down the CTRL button and using the scroll wheel it is possible to zoom in and out on the X axis. Scroll up to zoom in, scroll down to zoom out.
 - Setting a static cursors: By holding down the CTRL button and left clicking anywhere on the graph you can set static cursors for the functionality mentioned above. You can set a maximum of two cursors, when two cursors are set and the combination CTRL + left click is pressed again both cursors will be removed. The Delta X, Minimum Y and Maximum Y only display values if both cursors are set.

When the oscilloscope does not appear to be working you can take the following steps to try and get it to work again:

1. Click the reset view button to try and make the oscilloscope appear again.
2. Restart the oscilloscope by clicking the Start/Stop button.
3. Reopen the oscilloscope window.
4. Close the oscilloscope window and the Identify ECU window. Reconnect with an ECU using the disconnect and connect button

Appendix A - Trouble shooting

When communication with an ECU fails the following items can be checked:

- Is the ECU powered on?
 - Check "Power ON" LED on the ECU.
- Is the correct CAN bus selected?
- Is the correct baud rate selected?
- Is the CAN bus properly terminated?
- Are the other diagnostic tools running?
- Do all ECUs on the network have a unique address?
 - Check using "Identify ECU"
- Is there any communication possible?
 - Check using "Identify ECU"
- Check the "CAN" LED on the ECU for CAN activity.

Appendix B - Contact

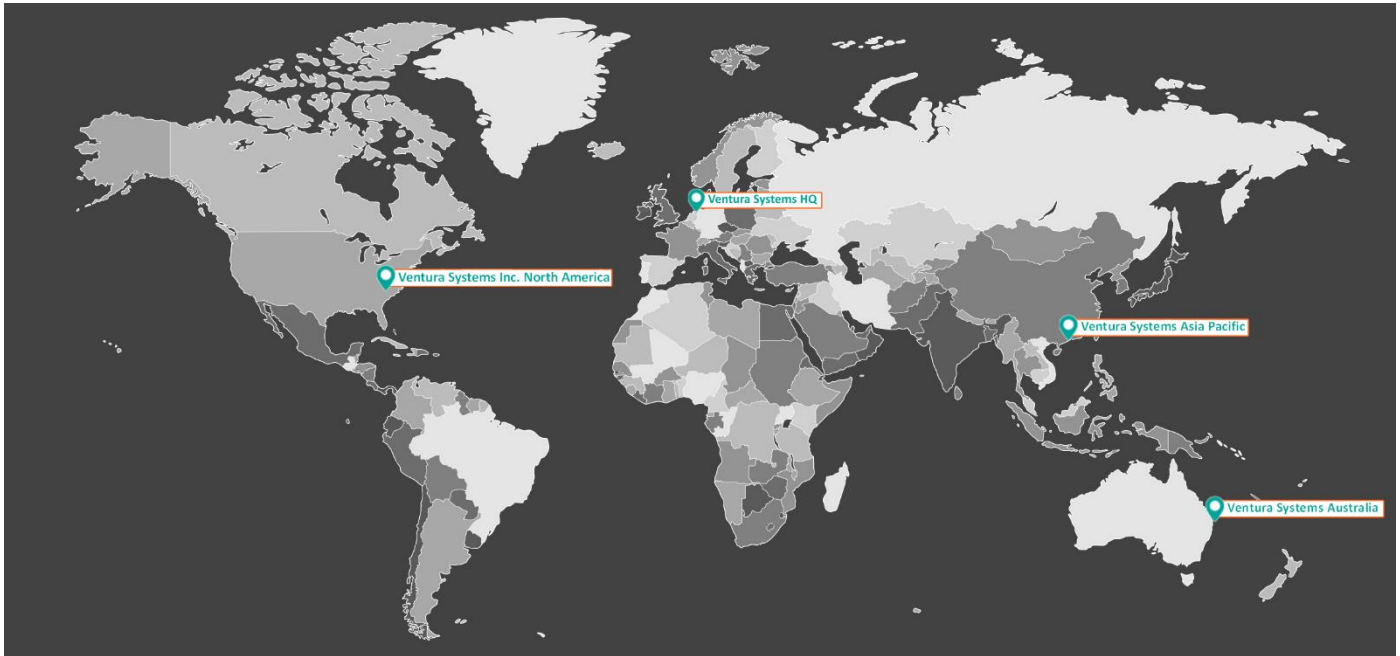


Figure 14: World map Ventura locations

Ventura Systems HQ	Ventura Systems Asia Pacific	Ventura Systems Australia	Ventura Systems Inc North America
 De Marne 216 8701MH Bolsward The Netherlands	Unit 10 on the 13/F Fotan Industrial Centre 26-28 Au Pui Wan Street Hong Kong	PO Box 284 Sanctuary Cove QLD 4212 Australia	160 Gibson Ct NC 28034 Dallas
 +31 (0) 51 557 7750	+852 2712 6001		+1 704-691-0311
 +31 (0) 51 557 3410	+852 2512 2325		+1 704-691-0313
 support@venturasystems.com	info@venturasystems.hk	info@venturasystems.com.au	info@venturasystems.com
 www.venturasystems.com			

Table 10: General contact information



Ventura Systems HQ	Ventura Systems Asia Pacific	Ventura Systems Australia	Ventura Systems Inc North America
 parts@venturasystems.com	info@venturasystems.hk	info@venturasystems.com.au	info@venturasystems.com
 +31 (0) 515 577485			

Table 11: Parts contact information

Contact your local Agent for parts.

Appendix C - PCAN View Tracing

Using the free tool PCAN-View, which is included with the drivers for the PCAN-USB interface, it is possible to create CAN traces in the Peak .trc format.

Files in this format can be analyzed by Ventura in case of issues with a door system.

- Start PCAN-View

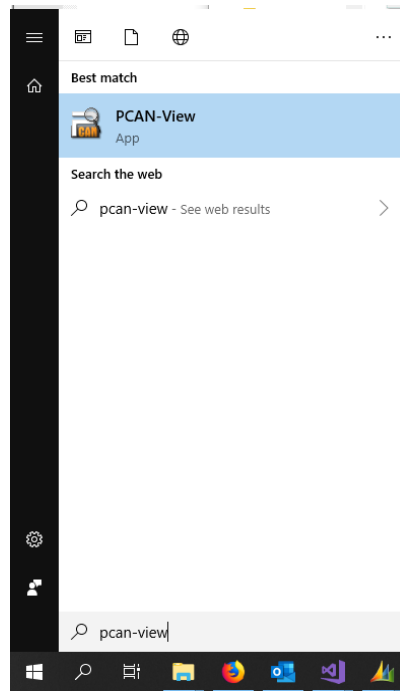


Figure 15: Find PCAN-View

If PCAN-View is not installed on your system, run the installer for the PCAN-USB drivers again and select PCAN-View for installation.

- Choose a connection
- Set filter settings to 'Extended'

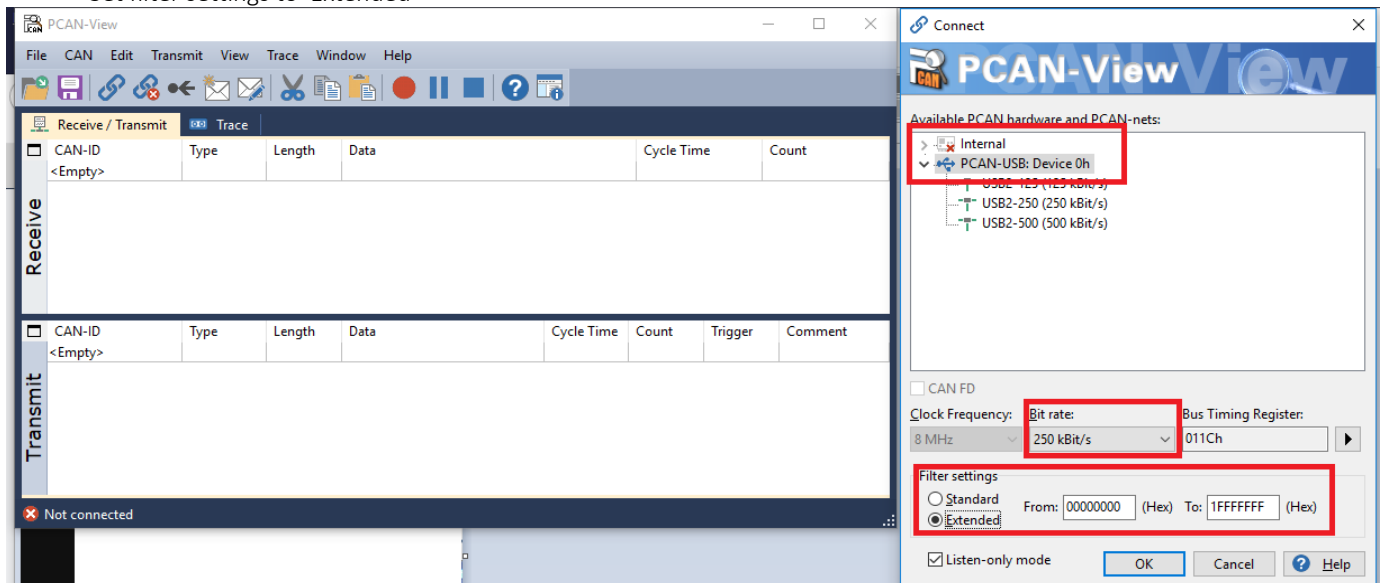


Figure 16: Connection settings

If no CAN messages appear here, check baud rate and physical connection.

- Make sure the trace settings are as in the image

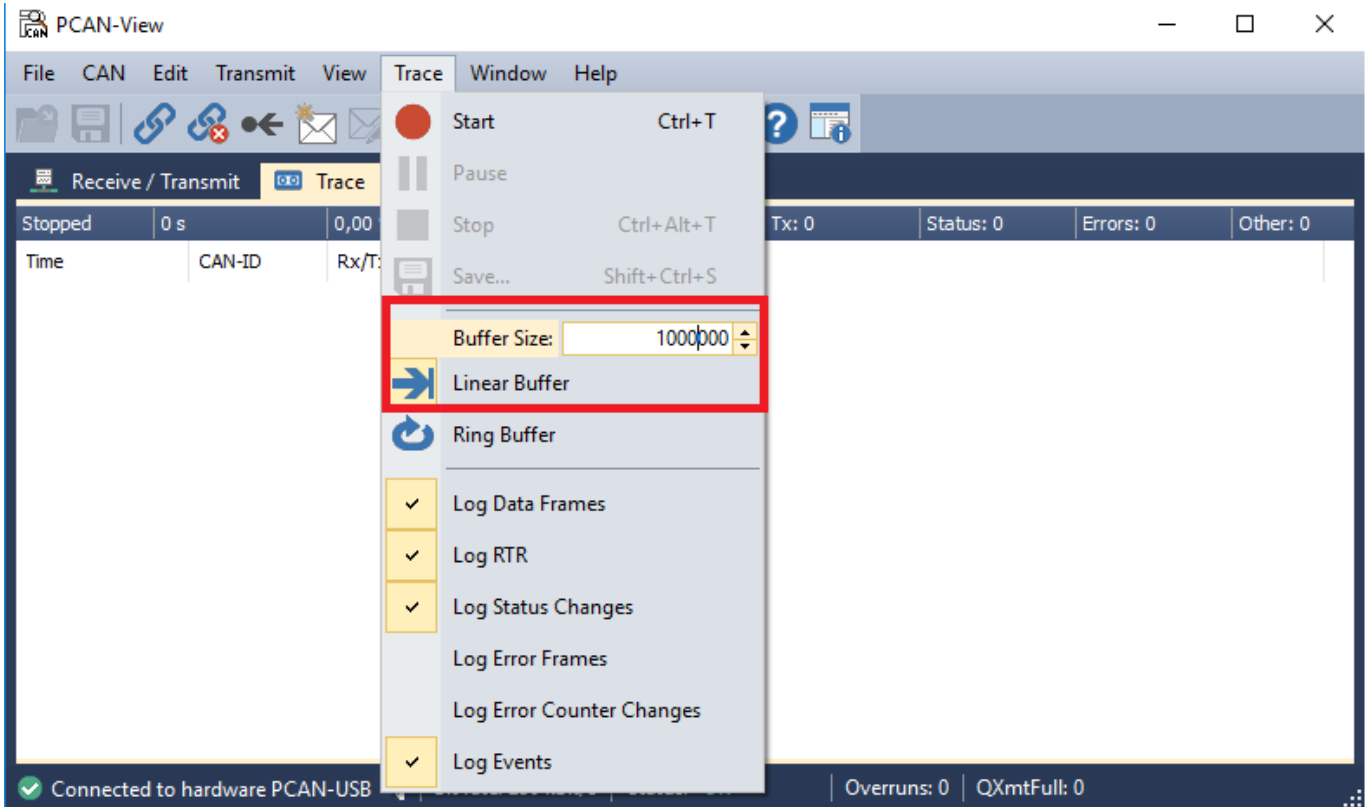


Figure 17: Trace settings

- Start the trace

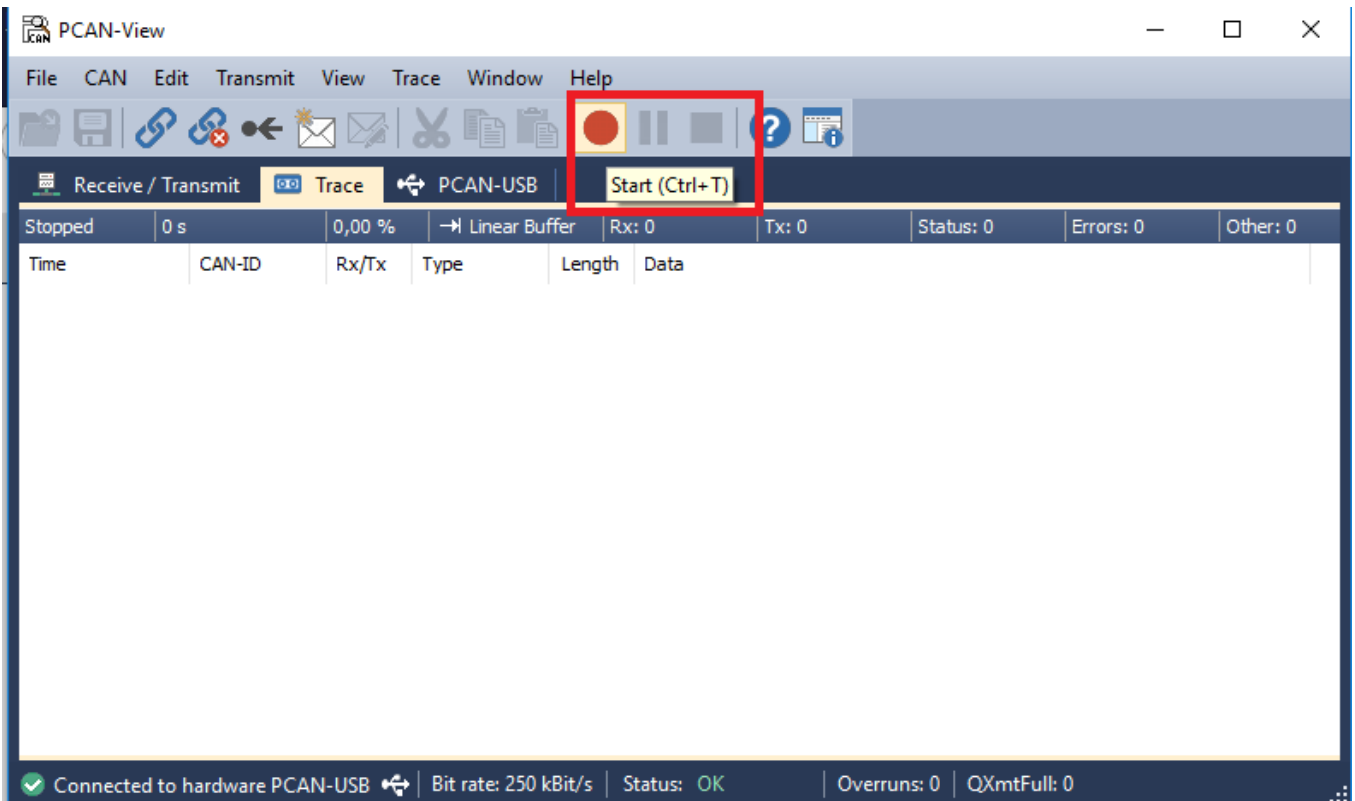


Figure 18: Start trace

- When the issue has been reproduced, end the trace

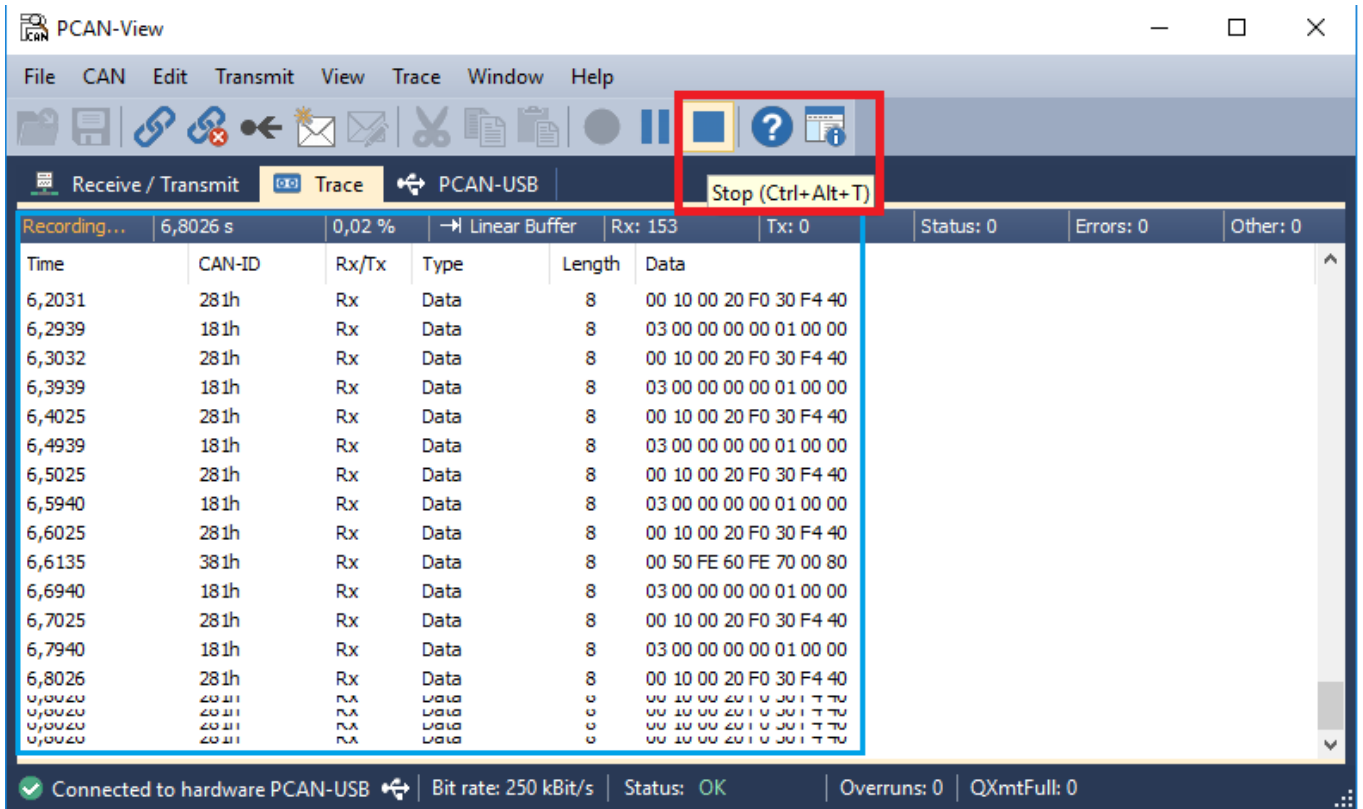


Figure 19: Stop trace

- Store the trace file

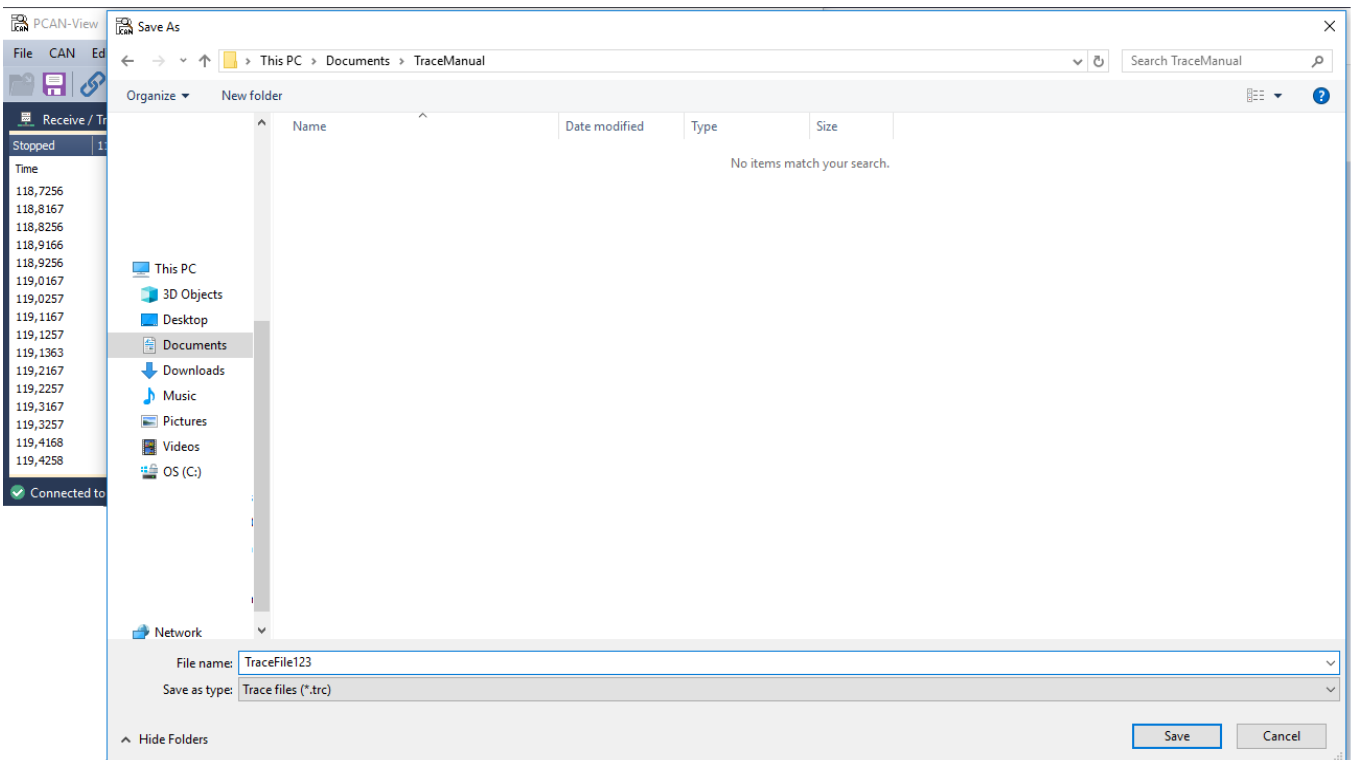


Figure 20: Save trace file