CANcapture® Advanced CAN Diagnostic Software





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1 INTRODUCTION

Thank you for purchasing CANCapture from EControls. CANCapture is the complete Controller Area Network (CAN) solution that offers every feature one would expect from a CAN diagnostic and analysis tool and more.

To start using CANCapture you will first need to install the software. Please refer to the Section 3 for software installation steps; CANCapture user instructions begin in Section 4.

NOTE: This manual replaces the following legacy documents:
 – EPC0061 (CANCapture Installation Procedure)
 – ERC0016 (CANCapture User Manual)

CANCapture is supplied with a custom ECOM cable that is enabled to run your new CANCapture software. The ECOM cable is a USB2.0 High-Speed device that allows Controller Area Network (CAN) traffic to be transmitted and received using a computer or laptop. You may distribute the software to as many target machines that you like; however, the software will only operate with the CANCapture enabled ECOM device.





2 ACRONYM / ABBREVIATION DEFINITIONS

The following acronyms/abbreviations are found within the manual sections that follow:

ACRONYM/ ABBREVIATION	DESCRIPTION
ASCII	American Standard Code for Information
	Interchange – character encoding standard
CAN	Controller Area Network
ССР	CAN Calibration Protocol
CSV	Comma-Separated Variable
DBC	Visual FoxPro database file extension
DTC	Diagnostic Trouble Code
ECOM	EControls COM munication Interface
HEX	HEXadecimal
IEEE	Institute of Electrical and Electronics Engineers
J1939	SAE standard – recommended practice used for
	communication and diagnostics among vehicle
	components
NMEA	National Marine Electronics Association
PGN	Parameter Group Number
SPN	Suspect Parameter Number



3 SOFTWARE INSTALLATION

To start using CANCapture you will first need to install the software. Please refer to the steps in this section for software installation instructions.

1) Locate the CANCapture installer file CANCapInstaller_Vx.x.exe.

NOTE: (x.x) will be a decimal number value representing the most recent revision of the software.

2) Right-click the file name or installer icon and select 'Run as Admin' from the context-specific dropdown.



- 3) Select **[Yes]** to the Windows system message asking for authorization to make changes to the PC or device.
- 4) After a **Preparing to Install** window appears briefly, select **[Next >]** at the CANCapture installer **Welcome** window:

CANCapture - InstallShield	Wizard		🔀 CANCapture - Installation W	Vizard
2.	Preparing to Install			Welcome to the Installation Wizard for CANCapture
	CANCapture Setup is preparing the I will guide you through the program so wait.	nstallShield Wizard, which etup process. Please	E.	The Installation Wizard will install CANCapture on your computer. To continue, click Next.
	Extracting: CANCapture.msi			
				WARNING: This program is protected by copyright law and international treaties.
	5			
		Cancel		< Back Next > Cancel
uarv. 2022	Page 8 of 111	Document Title: (CANCapture User Man	uual (Rev B1) EContro





5) At the License Agreement window, click to Accept the license agreement terms, then select [Next >].

🔂 CANCapture - Installation Wizard	×
License Agreement Please read the following license agreement carefully.	
CANCAPTURE LICENSE AGREEMENT	^
IMPORTANTREAD CAREFULLY: This End-User License Agreement ("EULA") is a legal agreement between you (either an individual or an entity) and EControls, Inc. ("ECI") for the CANCapture software product, ECOM Hardware Device and any included components or materials ("PRODUCT"). BY INSTALLING, COPYING, OR OTHERWISE	~
I accept the terms in the license agreement I do not accept the terms in the license agreement	
InstallShield	

6) At the **Destination Folder** window, select **[Change...]** to modify the default installation folder as needed, then select **[Next >]**.







记 CANCapture - Installation Wizard	×
Ready to Install the Program The wizard is ready to begin installation.	7 ®
If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard. Current Settings:	
Setup Type: Typical	
Destination Folder: C:\Program Files (x86)\EControls\CANCapture\	
User Information: Name: Company: EControls	
InstallShield < Back Install) Cancel	

8) The **Installing CANCapture** window will show installation progress before transitioning to the **Installation Wizard Completed** window. Select **[Finish]** to finalize the installation and close the installer.

🔀 CANCap	sture - Installation Wizard — 🗌 🗙	🛃 CANCapture - Installation W	/izard X
Installing The prog	pram features you selected are being installed.		Installation Wizard Completed
1 1	Please wait while the Installation Wizard installs CANCapture. This may take several minutes.	E.	The Installation Wizard has successfully installed CANCapture. Click Finish to exit the wizard.
	Status: Copying new files		
InstallShield -			
	< Back Next > Cancel		< Back Finish Cancel
You are r	now ready to start using CANCapture !		

CANcapture



4 GRAPHICAL WORKSPACE AND DATA FLOWCHART

CANCapture uses a graphical data work space flow chart as its centralized location for managing and controlling the program's behavior. The flow chart is used to visually control the flow of CAN traffic in and out of various function blocks which can each handle, interpret, and react to data in unique ways. The flow chart is highly flexible, allowing one to freely manipulate function blocks and draw interconnects at any time (before or during a "live" capture) and in any way.

- The interface is completely flexible add unlimited function blocks anywhere on the grid and join them with interconnect lines that can be branched and connected in any way. Interconnect lines turn green to easily identify when they are properly connected.
- The flow chart can be manipulated during a "live" capture and will immediately respond to changes. There's no need to stop a session just to change the data flow.
- Each block corresponds to its respective window (or panel), which can be renamed, disabled, focused, or removed all from the chart.
- Cut, copy, and paste functionality is supported as well as an import and export feature for saving and sharing configurations with others. For example, you can easily export your list of transmit messages or a custom packet filter to share with a colleague.



The ECOM block is typically the source of all messages throughout the CANCapture flow chart. Using the flexible nature of CANCapture's flow chart, one can easily wire and route the messages received on the CAN bus in an unlimited number of ways. For example, the output port of one ECOM block can be routed to the input port of another to create a simple bridge

between two CAN buses. Alternately, a packet filter or custom script can be placed between the two so that only specific messages will be forwarded - the possibilities are virtually endless.

Every message that is received by the ECOM block contains a hardware timestamp that is accurate within microseconds. The ECOM is capable of capturing CAN 2.0A (11-bit), CAN 2.0B (29-bit) messages, and all CAN error frames. All messages are fully supported throughout the CANCapture database and software.

J1939 multi-packet and NMEA-2000 Fast Packet messages are seamlessly supported by the ECOM block. Immediately after the final packet of the J1939 connection management session is received, the reassembled multi-packet message will be injected into the stream (unless disabled in the ECOM block properties). All other blocks that receive this message will treat it like a normal packet. This means that a packet-watch can monitor the packet's statistics; additionally user panels, graphs, and variable-watches can all access each variable of the multi-packet message.

If more than one ECOM device needs to be used in a CANCapture flow chart, the properties of each block can be manually configured to assign a specific device serial number to each. In addition specific CAN error frames and J1939 multi-packet support can be enabled or disabled in the properties.





4.1 Adding Function Blocks

To add a function block to the Graphical Data Flowchart simply click the right-hand mouse button to display the valid choices.

	Add Function Block	•
k	Pointer	
1	Line Connection	
Ж	Cut	
þ	Сору	
8	Paste	
×	Delete	
3	Import Selection	
7	Export Selection	

You may add a CAN message Source Device by selecting [Add Function Block \rightarrow Source Devices]. The following will be displayed:

Add Function Block				So	ur	ce	De	vio	ces	;		۲		E	EC	0	М	De	vic	e		
Pointer	Pointer Passive Interfaces					2	Þ	Liv	el	Re	pla	ау	Fil	e								
Line Connect	tion			Ac	tiv	e I	nt	erf	fac	es		۲	ľ	i.	ĵ	i.		ì		÷		i.
6 Cut			1		1		1		1			1										
Сору																						
B Paste																						
C Delete																						
1 Import Selec	tion																					
Export Selec	tion																					

Source Device selections are:

ECOM Device - The **ECOM Device** function block is used to represent an ECOM device physically connected to the local computer. As each message (or error frame) is received from the CAN bus, it is sent to the output port of the block. If a trace is connected to the input port of the ECOM block, each incoming message that is received will be transmitted on the respective CAN bus.

Live Replay File - The **Live Replay File** function block is used to playback CAN sessions previously captured and saved using a Recorder Block. The recorder simply saves every received CAN message to a user specified file so that it can be replayed at a later time. The live replay allows real-time playback, preserving all original timestamps in the process. An entire saved session can be perfectly replayed for repeated analysis; furthermore, rate of playback can be changed anywhere from 1/10th to 100x the original speed.





4.1.1 Passive Interface Function Blocks

You may add a passive function block by left-clicking the mouse on the specific selection in the drop down menu as illustrated below.

	Add Function Block	Source Devices	1.1.1	
k	Pointer	Passive Interfaces	-	User Panel
1	Line Connection	Active Interfaces	12.5	Raw Capture
Ж	Cut		1	Packet Watch
Þ	Сору			Variable Watch
В	Paste		2	Graph
×	Delete			Bus Statistics
1	Import Selection			Replay File Recorder
1	Export Selection			

The selections are:

- User Panel The User Panel block is designed specifically to display and monitor real-time data using a variety of fully customizable gauges, thermostats, number sliders, and text labels. The panel consists of a simple form editor that allows gauge items to be added and linked to any variable in the CAN database. Every aspect of the items can be configured to create a unique appearance; custom and pre-designed themes are also available.
- Raw Capture The Raw Capture block displays a real-time list of every CAN message (or error message) that is received by its input port. Aside from showing all the relevant information, if an incoming packet is defined in the current CAN database, the packet will be highlighted using the assigned color-code. The block also provides "live" text filtering based on all displayed columns, advanced hierarchical column sorting, locked/unlocked automatic scrolling, exporting to excel for post-analysis, full integration with the active CAN database, an advanced details view for each packet, and the ability to display all relevant fields in either decimal or hexadecimal.
- Packet Watch The Packet Watch block is used to monitor the statistics of individual packets
 received on the CAN network. It can be used to measure the average period, total message count,
 message rate, maximum period, minimum period, and last time received for any message type. All
 measurements are high-precision due to the utilization of hardware timestamps from the ECOM
 device are used.
- Variable Watch The Variable Watch block is used to monitor the value and stats of individual CAN variables. The watch list reports the current value as well as the average received period, total count, and last received timestamp for each chosen variable. The block also supports exporting all variables to a Microsoft Excel CSV file for easy post-analysis.
- **Graph** The **Graph** block is used to plot any variable in the CAN database; as each variable is received, it is plotted in real-time in the graph window. The graph was developed from scratch with the purpose of being able to handle streaming data with a moving time axis. Due to its tuned development efforts and focus on performance, there is no graphing tool available that is better suited for real-time streaming data response and display time is instantaneous.



- **Bus Statistics** The **Bus Statistics** block is used to report statistics for all CAN messages that are received. It displays information about the total packet counts, error counts, multi-packet counts, data transmission rates, bus loading, capture time, and the capture state.
- **Replay File Recorder** The **Replay File Recorder** saves every received CAN message to a user specified file so that it can be replayed at a later time. The live replay allows real-time playback, preserving all original timestamps in the process. An entire saved session can be perfectly replayed for repeated analysis; furthermore, the rate of playback can be changed anywhere from 1/10th to 100x the original speed.







4.1.2 Active Interface Function Blocks

To add active function blocks, select Active Interfaces as illustrated below:

	Add Function Block	Source Devices
R	Pointer	Passive Interfaces
1	Line Connection	Active Interfaces
¥	Cut	29-bit Message Transmitter
Ð	Сору	Custom Script
8	Paste	Packet Filter
X	Delete	Diagnostics (J1939)
1	Import Selection	CCP Tester
-3	Export Selection	· · · · · · · · · · · · · · · · · · ·

The selections are:

- **11-bit Message Transmitter/29-bit Message Transmitter** The 11-bit and 29-bit Transmitter blocks are used to generate messages on the CAN network. Each transmitter can be configured to send pre-defined messages after a certain time offset, at a recurring interval, or after a hot-key is pressed by the user. Standard CAN and J1939 packets are both supported along with all relevant fields.
- Custom Script The Custom Script block is used to write customized code that can interact with incoming and outgoing packets. The C/C⁺⁺-like syntax can be easily learned even by non-programmers based on the many examples and documentation that is available. If a special function is needed and none of the other blocks can do it, the scripting will be able to fill the gap. Easily implement advanced filters, triggered responses, data encryption/decryption, end-of-line testing procedures, node emulators, etc.
- **Packet Filter** The **Packet Filter** block is used to selectively forward incoming CAN packets to the block's output port. Each filter can be configured as either a "Pass Filter," where only matching packets get forwarded, or as a "Reject Filter," where all messages are forwarded except those that match. Packets can be added, removed, enabled, or disabled, all while the capture is still "live".
- **Diagnostics (J1939)** The **Diagnostics (J1939)** block is used to display diagnostic trouble codes (DTCs) and other fault-code information for J1939 based systems. The diagnostic window displays the Malfunction Indicator Lamp (MIL), Red Stop Lamp, Amber Warning Lamp, and Protect Lamp states for all systems on the CAN network. It also has the ability to display an interactive list of all active, pending, and historic DTCs as well as freeze frame data and information.
- CCP Tester The CCP Tester block is used to test and diagnose a CAN Calibration Protocol (CCP) implementation. The block supports all the fundamental CCP commands: CONNECT, GET_CCP_VERSION, EXCHANGE_ID, GET_SEED, UNLOCK (CAL resource), SET_MTA, DOWNLOAD, UPLOAD, and DISCONNECT. It allows the user to enter a simple script to perform the custom GET_SEED/UNLOCK sequence and provides support for reading and writing arbitrary memory addresses in an ECU.





4.2 Configuring Function Blocks

Each function block may be configured by selecting the desired function block, right-clicking the mouse button, then selecting **[Properties]** from the drop down menu and left-clicking the mouse on the selection as illustrated below. The **Properties** window will indicate the parameters of the selected function block:



Any of the parameters may be modified by simply left-clicking on the parameter you wish to modify. Parameters that have boundaries on their values have a drop down menu for the selection of the valid choices for that particular parameter.





4.3 Connecting the Function Blocks

To connect the respective function block to the output of an ECOM, Replay Recorder or any other block, you simply right-click on the workspace and select [Line Connection]. Alternately, select the Line/Connection (Crtl+W) icon on the Graphical Workspace Toolbar menu and connect to the input of the function block you wish to receive the CAN messages, as illustrated below:

EControls CANCapture - C:\Program Files (x86)\EControls\CA	ANCapture\default.cfc			
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Req. Transmitter			Export Selection	
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	Diagnostics (J1939)			
	DTC			

The **Drawing Pen** will now appear. You may now connect the function blocks as you please. When you have completed the connection of the function blocks you may exit the **Line Connection** function by depressing the **[ESC]** key on the keyboard or select the **[Pointer]** option from the drop down menu.





4.4 Renaming Function Blocks

You may rename the function blocks by right-clicking on the function blocks that you want to rename and selecting **[Rename Block]** by left-clicking on the selection and typing in a unique name of your choice as illustrated below. Alternatively, you may depress the **[F2]** Key on the keyboard with the function block selected.

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File Edit View	Flowchart User Par	nel			
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E,			Packet		
	Req. Transm	itter	Oustom Pane		
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			Diagnostics (J	1939)	
			DTC		



4.5 Enabling / Disabling Function Blocks

You may **Enable** or **Disable** a function block – either active or passive – by left-clicking on the function block you wish to effect and selecting either [**Disable Block**] or [**Enable Block**] from the drop down menu by left-clicking the mouse on the selection as illustrated below.







4.6 Saving Your Workspace Chart

You may save your **Workspace Chart** to a location of your choice by selecting **[File]** on the upper tool bar menu and then **[Save Workspace As]** or **[Save Workspace Ctrl+S]** from the drop down menu by leftclicking the mouse on the selection. Select the location where you want to save the **Workplace Chart** and double click on the **[Save]** button as illustrated below.







4.7 Retrieving a Saved Workspace

You may **Retrieve** a saved **Workspace Chart** by selecting **[File]** on the **Tool Bar Menu** and then selecting **[Open Workspace Ctrl+O]**. When the window opens, select the location of the saved **Workspace Chart** that you want to retrieve and select it by double-clicking with the left-hand mouse button as illustrated below.





4.8 Exporting a Function Block to a File

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You may save a function blocks with all the settings you have selected to a file of your choice. To save a function block, right-click the mouse on the function block and select **[Export Selection]** by left-clicking on the selection as illustrated below.



You may now select the location on your computer where you wish to save the function blocks for importing at a later time. You may give the file a name of your choice and select [Save].



4.9 Importing a Saved Function Block

You may import a saved function block to your workspace flowchart by right-clicking on a workspace and selecting **[Import Selection]** from the drop down menu by left-clicking the mouse on the selection as illustrated below.



You may now navigate to the file name that you exported the function block properties to and select **[Open]**.



4.10 Starting and Stopping CANCapture

To initialize **CANCapture** select the green arrow [▶] in the toolbar or depress **[F9]** on the keyboard as illustrated below. This will enable all **ECOM** devices and **Replay** blocks and begin transmitting and receiving CAN messages.







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CANcapture

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5 RAW CAPTURE FUNCTION BLOCK

5.1 Displaying the Raw Capture Window

You may display a capture window by right-clicking on the specific function block you want to display and selecting [Show Capture Window] by left-clicking the mouse on the selection as illustrated below.

EControls CANCapture - Workspace Chart	
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Drag a	column header her	re to group by	that column.									^
ID	Time	Type	Priority	Data Page	Reserved	PDU-F	PDU-S	Source Add	PGN	PID	Data Length	Dat
1490	9.843200	29-bit	3	0	0	240	4	0	61444	217056256	8	255
1491	9.848256	29-bit	0	0	0	239	18	0	61184	15667712	8	30
1492	9.858240	29-bit	0	0	0	239	18	0	61184	15667712	8	30
1493	9.863232	29-bit	3	0	0	240	4	0	61444	217056256	8	255
1494	9.868224	29-bit	0	0	0	239	18	0	61184	15667712	8	30
1495	9.878208	29-bit	0	0	0	239	18	0	61184	15667712	8	30
1496	9.883200	29-bit	3	0	0	240	4	0	61 444	217056256	8	255
1497	9.888256	29-bit	0	0	0	239	18	0	61184	15667712	8	30
1498	9.898240	29-bit	0	0	0	239	18	0	61184	15667712	8	30
1499	9.903232	29-bit	3	0	0	240	4	0	61444	217056256	8	255
1500	9.908224	29-bit	0	0	0	239	18	0	61184	15667712	8	30
1501	9.918208	29-bit	0	0	0	239	18	0	61184	15667712	8	30
1502	9.925200	29-6it	3	0	0	24.0	4	0	61444	217056256	8	253
1503	9.928256	29-bit	0	0	0	239	18	0	61184	15667712	8	30
1504	9.938240	29-bit	0	0	0	239	18	0	61184	15667712	8	30
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You may Start, Pause, or Stop the capture from the tool bar menu on the RAW Capture window.

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	2185	13.908672 2	29-bit	0	0	0	239	18	0	61184	15667712	8	30 120 0 1
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ID 2179 2180	This will prevent the capture list from re- packets while the p	e ourrent ceiving any ause is active.		0 0	0	239 239	18 18	0 0	61184 61184	15667712 15667712	8	3012001. 3012001.
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2179	transmitting and receiving CAN		0	0	239	18	0	61184	15667712	8	30 12
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CANcapture





You may clear the Raw Capture list by selecting the Clear List Icon located on the Raw Capture tool bar:

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0	Remove and delete all list items -	Data Page	Reserved	PDU-F	PDU-S	Source Add	PGN	PID	Data Length	Data
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100		0	0	240	4	0	61444	217056256	8	3\$5 255 12.

You can enable or disable the **Color filter** by selecting the Enable **Color Filters** icon located on the **Raw Capture** tool bar menu:

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2180	13.87	matched to the CAN database.		0	239	18	0	61184	15667712	8	30 120
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The display can be in either hexadecimal or decimal by selecting the **HEX** icon form the **Raw Capture** tool bar menu:

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2180	13.878144			0	245	4	0	6164	ADDOTT IL	8	30 120 0 1



6 CAN DATABASE

The CAN database is used to identify every packet that is received on the CAN network and passed within the graphical flow chart. Packets are broken into individual variables, and each variable can be assigned a unique conversion formula, operational range, unit, and name. The CANCapture database supports the standard features one would expect from a CAN database, along with many other features:

- The database is integrated into the application, so you can easily add new definitions, jump to existing, add new graphs or variable watches, and manage all variables from one convenient location.
- Support for all variations of CAN protocols SAE J1939, CAN bus, NMEA-2000, and other proprietary specifications. Includes full J1939 database and natively supports PGN and SPN identifiers.
- Supports importing of other existing .DBC databases.
- Assign color codes to each packet to help easily identify each message type in the "Raw Capture" list.
- Signed, unsigned, IEEE float, IEEE double, and ASCII variable types along with big or little (Motorola or Intel) byte ordering.
- Includes support for the NMEA-2000 Fast Packets and the J1939 transport protocol, including J1939 multi-packet messages, variable length ASCII SPNs, and diagnostic messages and diagnostic trouble codes.
- Integrated "hot-filter" search functionality allows quick and easy access to all variables.

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J1939	61444	EEC1	8	8	Electronic Engin	e Controller 1									
J1939	61445	ETC2	8	5	Electronic Trans	mission Controller 2									
J1939	61446	EAC1	8	10	Electronic Axle (Controller 1									
J1939	61447	FLI1	8	4	Forward Lane In	mage urgent msg									
J1939	61448	HPG	8	4	Hydraulic Press.	are Governor Info									
J1939	61449	VDC2	8	6	Vehide Dynamic	Stability Control 2									
J1939	61450	EGF1	8	2	Engine Gas Flow	r Rate									
a J1939	61451	ESC1	8	7	Electronic Steer	ing Control									
J1939	61452	ETC8	8	1	Electronic Trans	mission Controller #8									
J1939	61453	LOI	8	9	Land Leveling S	ystem Operational Inf									
J1939	61454	AT1IG1	8	10	Aftertreatment	1 Intake Gas 1	-								
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2927 Ad	tual Inner whee	l steering angl	e	1	1	16	Actual Inner wheel steering angle	Unsigned	Little Endian	0.003906	-125	deg	-125	125	1
2926 Typ	pe of Steering T	ransmission		6	1	4	Type of Steering Transmission	Unsigned	Little Endian	1	0	bit	0	15	1
2925 Typ	pe of Steering P	orces		5	5	4	Type of Steering Forces	Unsigned	Little Endian	1	0	bit	0	15	1
2924 Std	sering Type			5	1	4	Steering Type	Unsigned	Little Endian	1	0	bit	0	15	1
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6.1 Modifying Packet Properties

To modify packet properties simply right-click on the packet and select **[Properties]** on the drop down menu by left-clicking the mouse on the selection as illustrated below.

EControls	CANCapture	- CAN Data	ibase -	detau	llt.ccd*		
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2 3 3 8	8 3						
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Aa J1939	59392	ACKM	8	9	Acknowledgment	Message	
Act J1939	59904	RQST	3	1	Request		
Aa J1939	60160	TP.DT	8	2	Transport Protoco	ol - Data Transfer	
Aa J1939	60416	TP.CM.xx	8	16	Transport Protoco	ol - Connection Mgmt	
4a J1939	60672	N.xx	65	. 0	Network Layer		_
Am J1939	60928	AC	8	1	Address Claimed		_
Aa J1939	61440	ERC1	8	13	Electronic Retarde	er Controller 1	-
Aa J1939	61441	EBC1	8	22	Electronic Brake C	Controller 1	_
Aa J1939	61442	ETC1	8	9	Electronic Transm	ission Controller 1	
Aa J1939	61443	EEC2	8	10	Electronic Engine	Controller 2	-
Aa J1939	61444	EEC1	8	8	Electronic Engine	Controller 1	-
Aa J1939	61445	ETC2	8	5	Electronic Transm	ission Controller 2	_
J1939	61446	EAC1	8	10	Electronic Axle Co	ontroller 1	_
J1939	61447	FLI1	8	4	Forward Lane Ima	age urgent msg	_
Aa J1939	61448	HPG	8	4	Hydraulic Pressure	e Governor Info	
Aa J1939	61449	VDC2	8	6	Vehicle Dynamic S	tability Control 2	_
J1939	61450	EGF1	8	2	Engine Gas Flow F	Rate	-
Aa J1939	New Packe	t	8	7	Electronic Steering	g Control	
Aa J1939	Belete Pac	ket	8	1	Electronic Transm	ission Controller #8	-
🔬 J1939 °			8	9	Land Leveling Sys	tem Operational Inf	
Aa J1939	Insert Vari	able	8	10	Aftertreatment 1	Intake Gas 1	-
J1939	Watch	•	8	10	Aftertreatment 1	Outlet Gas 1	_
Aa J1939	Search Da	tabase	8	10	Aftertreatment 2	Intake Gas 1	
J1939	Properties		8	10	Aftertreatment 2	Outlet Gas 1	
J1939 L			8	4	Fifth Wheel Smart	t Systems 1	
I 7 Nam	61450 ne	CCT	8	Byte P	Slope Sensor Info Bit Pos	Len	Parameter Name
🥥 2928 Axle	Location			3	1	8	Axle Location
🥥 2927 Act.	ual Inner wheel	steering angle		1	1	16	Actual Inner whe
🧳 2926 Type	e of Steering Tr	ansmission	1	6	1	4	Type of Steering
🧳 2925 Type	e of Steering Fo	orces	1.0	5	5	4	Type of Steering
🧳 2924 Stee	ering Type			5	1	4	Steering Type
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The **Packet Properties** window will now open, displaying the details of the packet. You may customize the packet by changing the color of the **Text** and **Background** by highlighting your selection (by left-clicking on either **Text** or **Background**) and then left-clicking on the [...] button at the end of the **Color Properties** bar and selecting a color from the **Standard** or **Custom** color pallet as illustrated below. This is extremely helpful when one is trying to identify a packet when viewing a raw capture of all packets being transmitted on the CAN bus.

When you are satisfied with the color choice left-click the mouse on the **[OK]** button to accept it. If you want to discard your changes and return to the previous menu left-click on the **[Cancel]** button.

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6.2 Adding a new Packet to the Database

You may add a new packet to the database by simply left-clicking on the **New Packet** icon on the tool bar menu as illustrated below.

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Aa J1939	768	EBS21	8	0	Reserved for ISO 11992
Aa J1939	1024	XBR	8	7	External Brake Request
Aa J1939	1280	CAM11	8	0	Reserved for CANopen
J1939	1536	CAM21	8	0	Reserved for CANopen
J1939	1792	GPV4	8	4	General Purpose Valve Pressure
Aa J1939	2048	AUXIO5	8	4	Auxiliary Input/Output Status 5
Aa J1939	39424	GPM18	8	0	Reserved for ISO 11992
Aa J1939	39936	AUXIO7	8	8	Auxiliary Input/Output Status 7
Aa J1939	40192	AUXIO6	8	8	Auxiliary Input/Output Status 6
Aa J1939	40448	DM29	0	0	DTC Counts (DM29)
Aa J1939	40704	DM35	65	12	Immediate Fault Status (DM35)
Aa J1939	40960	DM34	0	0	NTE Status (DM34)
Aa J1939	41216	DM33	0	0	Emission Increasing Auxiliary Emission
Aa J1939	41472	DM32	0	0	Regulated Exhaust Emission Level Exc
Aa J1939	41728	DM31	0	0	DTC To Lamp Association (DM31)
J1939	41984	DM30	0	0	Scaled Test Results (DM30)
Aa J1939	42240	AUXIO4	8	32	Auxiliary Input/Output Status 4
Aa J1939	42496	AUXIO3	8	32	Auxiliary Input/Output Status 3
Aa J1939	42752	AUXIO2	8	32	Auxiliary Input/Output Status 2
J1939	43008	DISP1	65	3	Text Display
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A 3350 TSC1 Con	trol Purpos	se 5	4	5	TSC1 Control Purpose Unsigne



A new line with your new packet will be automatically inserted. You may now edit the properties of your new packet by right-clicking on the new packet and then selecting **[Properties]** on the drop down menu by left-clicking the mouse on the selection as illustrated below.

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Aa 2	31939	256	TC1	8	23	Transmission Control 1		
la i	31939	512	EBS11	8	0	Reserved for ISO 11992		
۹a J	J 1939	768	EBS21	8	0	Reserved for ISO 11992		
la i	11939	1024	XBR	8	7	External Brake Request		
la i	J 1939	1280	CAM11	8	0	Reserved for CANopen		
No 1	11939	1536	CAM21	8	0	Reserved for CANopen		
la 1	J 1939	1792	GPV4	8	4	General Purpose Valve Pressure		
la J	J 1939	2048	AUXIO5	8	4	Auxiliary Input/Output Status 5		
Aa J	J 1939	39424	GPM18	8	0	Reserved for ISO 11992		
Aa J	11939	39936	AUXIO7	8	8	Auxiliary Input/Output Status 7		
Aa J	11939	40192	AUXIO6	8	8	Auxiliary Input/Output Status 6		
Aa J	J1939	40448	DM29	0	0	DTC Counts (DM29)		
Aa J	11939	40704	DM35	65535	12	Immediate Fault Status (DM35)		
Aa 3	11939	40960	DM34	0	0	NTE Status (DM34)		
Aa J	11939	41216	DM33	0	0	Emission Increasing Auxiliary Emission C		
Aa J	11939	41472	DM32	0	0	Regulated Exhaust Emission Level Exce		
Aa 1	11939	41728	DM31	0	0	DTC To Lamp Association (DM31)		
1 0 3	J 1939	41984	DM30	0	0	Scaled Test Results (DM30)		
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Aa	J1939	3	New Packet			8	23	Transmission	Control 1				
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La	J1939		Watch			8	7	External Brake Request					
ta.	J1939		Court Database		11	8	0	Reserved for	CANopen				
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4a	J1939		39424	GPM	18	8	0	Reserved for	ISO 11992	2			
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\a	J1939		40448	DM2	9	0	0	DTC Counts ()	DM29)				
\a	J1939		40704	DM3	5	65535	12	Immediate Fa	ult Status (DM35)			
la.	J1939		40960	DM3	4	0	0	NTE Status (D	M34)				
ka	J1939		41216	DM3	3	0	0	Emission Incre	asing Auxil	iary Emiss	ion C		
Aa	J1939		41472	41472 DM32		0	0	Regulated Exhaust Emission Level Exce			Exce		
Аð	J1939		41728	DM31		0	0	DTC To Lamp Association (DM31)					
Va:	J1939		41984	DM3)	0	0	Scaled Test Results (DM30)					
ka.	J1939		42240	AUXI	04	8	32	Auxiliary Inpu	t/Output St	tatus 4			
4a	J1939		42496	AUXI	03	8	32	Auxiliary Inpu	t/Output St	tatus 3			
-	J1939		42752	AUXI	02	8	32	Auxiliary Inpu	t/Output St	tatus 2			





You may edit the various properties of your new packet such as selecting **Raw Identifier** or **J1939** by leftclicking on the [▼] **Packet Protocol** bar and then left-clicking again on the selection as illustrated below.

e Edit View Flowchart User Panel		Opti
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Set Protocol		





7 GRAPH FUNCTION BLOCK

To enable the graphing function, left-click on the **Graph** function block as illustrated below. CANCapture is capable of graphing data in real time as it is captured or from a previously recorded data session.



The Graph window will now appear.





7.1 Adding or removing a series to your graph

You may **Add** or **Remove** a data series to your graph by either right-clicking on the graph and selecting **[Add/Remove Series...]** from the drop down menu by left-clicking the mouse on the selection or by selecting **[Series Config]** from the **Graph** window tool bar menu as illustrated below.






7.2 Selecting Variable(s) on Graph

You may now select the **Variable**(s) you wish to display on the graph from the list that is displayed by leftclicking on the selection box to the left of the **Variable** you wish to display.

To remove a **Variable** from the graph left-click on the box to remove the selection check mark [v] from the box.

When you have completed selecting the **Variable**(s) you wish to display on the graph, left-click on the **[Select]** button. If you wish to cancel this process and return to the graph window, left-click on the **[Cancel]** button.

Graph																								
R 🖑	Q (Q L	1-	- s	eries	Confi	g Ti	me Inte	rval (s)	10														
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200	1				1		1																	
0	1).0	0.5	1	0	1.5		2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8	.5	9.0	9.5	10





7.3 Editing a Series for Graphing

You may edit a data series on the graph by selecting the **[Series Config]** from the **Graph** toolbar menu, selecting the data series you wish to edit and selecting **[Edit Series]** as illustrated below.



7.4 Setting the Data Series Display Color

You may set the color you wish the data series to be displayed in on the graph by selecting the specific color from the drop down menus on the **Series Color:** selection on the **Dialog** window under **Series Appearance** as illustrated below.





7.5 Selecting Line Style for the Graph

EControls°

You may select the line style you wish to display the data series on the plot by selecting **Series Style:** from the drop down menu on the **Dialog** window under **Series Appearance** as illustrated below. The choices are **Line (Steps)**, **Line (Straight)**, or **Point**.





7.6 Selecting a Point Style Graph

EControls[•]

You may select the **Point Style** you wish to display by selecting it from the drop down menu on **Point Style**: on the **Dialog** window as illustrated below. The points may be displayed as **Circles**, **Triangles** or **Squares**.







7.7 Selecting the Line Width for a series displayed as a Line Graph

You may select the **Line Width** for a data series that is being displayed as a line graph by selecting the relative line size from the drop down menu on the **Dialog** window as illustrated below. The choices are from **1** to **5**.







7.8 Selecting the Range Setting for the Data Series

You may select the various **Range Settings** for the data series by making your selections under the **Range Settings** of the **Dialog** window.

You may choose to display the range for the data series on the **Primary Y-Axis** or the **Secondary Y-Axis** by left-clicking on the selection circle following the choice. A check mark **[v]** will appear in the selection box upon selection acceptance as illustrated below.





7.9 Setting the Minimum and Maximum Range Values for a Data Series

You may set the **Minimum** and **Maximum** values for the data series that is being displayed on the graph by entering the values on the **Dialog** window under the **Range Settings** in the **Min Y Value:** and **Max Y value:** fields, as illustrated below:



When you are satisfied with your settings, you may left-click the mouse on the **[OK]** button. If you want to discard your changes and return to the previous window, left-click the mouse on the **[Cancel]** button.





7.10 Selecting the Default SPN Range Value

Alternatively, you can select to use the default SPN range values by selecting the **[Set Default SPN Range]** selection button on the **Dialog** window under **Range Settings**. The **Default SPN Range** is retrieved from the CAN database for the respective SPN.



After you have completed selecting all the display parameters for the data series, you may accept the selections and exit the **Dialog** window by left-clicking on the **[OK]** button. If you wish to discard your entries and exit the **Dialog** window, left-click on **[Cancel]** button.





7.11 Using the Panning Tool on the Graph Window

You may enable the **Panning Tool** by selecting the **Panning Mode** icon from the **Graph** window toolbar and left-clicking and holding down the left mouse button while scrolling through the graph as illustrated below.

Grap	h		
* 🔇	🍸 🔍 🔍 🔛 🔤 🕂 Series Config	Time Interval (s)	10
32	ং ^ক) Panning Mode		
30	Enable panning mode - left-click and drag to pan (or scroll) the		
28	movement.		
260	00		
240	00		
220	00		
200	00		
18	00		





7.12 Zooming in on a specific area of the graph

You may zoom in on a specific area of the graph by selecting the green **Zoom In** icon on the **Graph** window tool bar and then selecting and area you wish to zoom by clicking and dragging the left mouse button as illustrated below.



7.13 Zooming Out

You may zoom out on the graph by selecting the red **Zoom Out** icon on the **Graph** window tool bar menu and left-clicking on the graph as illustrated below.

Graph		
🕨 🖑 🔍	🜏 🔛 🕂 – Series Config 🛛 Time Interval (s) 1.32036 👘	8
	Q Zoom Out	1
2260	Enable zoom-out mode - dick to	
2240	zoom out on the chart area around the mouse.	
2220		
2200		





7.14 Resetting All Graph Ranges to Default Values

You may reset all graph ranges to default values by selecting the **Reset All Axis Ranges** icon on the **Graph** window tool bar menu as illustrated below. All graph axes will be reset to the default values defined in the CAN database.



7.15 Enabling and Locating Display Cursors

You may enable display cursors to aid in the measurement of any two points on the graph either in the **X** or **Y** axis by selecting the [+] **Display Cursors** icon from the **Graph** window tool bar menu as illustrated below. After enabling, you may locate the cursors using the right mouse button. The cursor window that appears will display the absolute values of each cursor as well as the difference between the two cursors in both the X and Y axis illustrated as **dX** and **dY**.

NOTE: The pointer icon must be selected in order to drag and move the cursors.





7.16 Bus Statistics Function Block

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You may display the CAN bus statistics (**Bus Stats**) window by right-clicking on the **Bus Stats** function block on the **Workspace Chart** window and selecting **[Show Stats Window]** by left-clicking on the selection as illustrated below, or by simply double-clicking the left mouse button on the **Bus Stats** function block.



The Bus Stats window will now open, displaying the current statistics of the CAN Bus.

	4 🖆 🕼 🕼 🔮	- in	🛓 📮 🗧 🔏 🖄 🖄 🛠 🌝 🔊 🥙 🥫 k 🤹 Hide/Show Windows * 🕞 Bring to Fra
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/	Workspace Chart Custon	Panel Diagnostics (J	1939) Bus Stats Raw Capture CAN Database - default.ccd
	Statistic	Value	
	Capture State	Active	
	Capture Time	2.6 s	
	Message Count	2773 msg	
	Byte Count	40716 bytes	
	Avg. Msg. Size	14.7 bytes	
	Msg/s	1091.57 msg/s	
	KByte/s	16.03 KB/s	
	Bus Load (250k)	51.30%	
	Multipacket Count	2	
	Error Count	0	



7.17 Variable Watch Function Block

EControls[®]

You may open the **Variable Watch** window by right-clicking on the **Variable Watch** function block and selecting **[Show Variable Watch Window]** by left-clicking the mouse on the selection as illustrated below, or by simply double-clicking the **Variable Watch** function block with the left mouse button:



The Variable Watch window will now appear and be selected.

the second secon	Raw Capture CAN Database - default.ccd					8453
	Bus State					
Short Boat Recording	Bam					
~ 1						
	In Onter					
-						
ECU Recording Replay Recorder						
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7.18 The Variable Watch Display Column Options

You may select the columns to display by right-clicking on the display column headings and selecting **Columns** from the drop down menu by left-clicking the mouse on the selection. The, simply check or uncheck the items you wish to display from the menu as illustrated below:

X 🗐								
Variable /	Parameter Name	Value	Units	Avg. Period	Msc Cou	nt		Last Receive
Accelerator Pedal Position 1	Accelerator Pedal Position 1	0.000	%		Columns	• •	[No Title]	
Battery Potential / Power Input 1	Battery Potential / Power In	14.400	Volts	1000.05 ms	Arrange By	•	ID	6.591808
Engine Fuel Rate	Engine Fuel Rate	16.850	l/h	99.99 ms	Best Fit	~	Variable	6.886656
Engine Intake Manifold #1 Pressure	Engine Intake Manifold #1P	0.000	k9a		0		Parameter Name	
Engine Intake Manifold 1 Temperature	Engine Intake Manifold 1 Te	0.000	C		0		Value	
Engine Speed	Engine Speed	2196.000	rpm	20.03 ms	344	Ľ	Value	6.876480
Engine Throttle Position	Engine Throttle Position	32.800	%	99.99 ms	69	¥	Units	6.886656
						~	Avg. Period	
						~	Msg Count	
						~	Last Received	
							-	8

7.19 Selecting the Arrangement the Variable Watch Columns

You may select the **Arrangement** of the display columns by left-clicking on the headings and selecting [**Arrange by** ►] from the drop down menu, followed by the column you wish to sort as illustrated below:

Parameter Name	Value	Units	Avn. Period /		Msg Count
Accelerator Pedal Position 1	0.000	%	Columns +		0
Engine Intake Manifold #1 Pressure	0.000	kPa	Arrange By	[No Title]	0
Engine Intake Manifold 1 Temperature	0.000	с	Best Fit	Parameter Name	0
Battery Potential / Power Input 1	14.400	Volts	1000.05 ms	Value	7
Engine Speed	2196.000	rpm	20.03 ms	Linite	344
Engine Throttle Position	32.800	%	99.99 ms	dia Balad	69
Engine Fuel Rate	16.850	l/h	99.99 ms	Avg. Period	69
				Msg Count	
				Last Received	

7.20 Selecting the Desired Variable to Display on Variable Watch

You may select the variable you wish to display on the **Variable Watch** window by double clicking on the **Choose Variables** icon on the **Variable Watch** widow tool bar as illustrated below:

Variable Watch			
🛃 🗙 😼			
Choose Variables	Value	Units	Avg. Period 🔺
Colort of the unrighter that will be	0.000	%	
Select all the variables that will be watched in this list.	0.000	kPa	
¢ []	0.000	С	
Battery Potential / Power Input 1	14.400	Volts	1000.05 ms
Engine Speed	2196.000	rpm	20.03 ms
Engine Throttle Position	32.800	%	99.99 ms
A Engine Eval Date	12 020	14.	00.00 ms



The following window will open, allowing you to select the variables you wish to display on the **Variable Watch** widow:

À		€ III		
		Diagnostics (31939)	Choose variables to display X	
		1	Fiter: Clear Fiter	
		DTC	Pkt Abrv / Proto ID Varia Variable Name Parameter Name	
			Pkt Abry:	
ariable Watch			J1939 64966 Engin Engine Start Enable	
×			J1939 64966 Engin Engine Start Enable	
Parameter Name	Value	Units	J1939 64966 Engin Engine Start Enable	Last Received
Accelerator Pedal Position 1	0.000	%	J1939 64966 Engin Engine Start Enable	
Engine Intake Manifold #1 Pressure	0.000	kPa		
Engine Intake Manifold 1 Temperature	0.000	с	PREADIVE A1	
Battery Potential / Power Input 1	14.400	Volts	A1 J1939 65277 Engin Engine Bower Bypa	6.591808
Engine Speed	2196.000	rpm	L AL J1959 05277 Engn Engne Gas Suppy	6.876480
Engine Throttle Position	32.800	%	Pkt Abry: A1SCRAI	6.886656
Engine Fuel Rate	16.850	l/h	AISCRAI J1939 61477 Aftert Aftertreatment 1 0	6.886656
			AISCRAI J1939 61477 Aftert Aftertreatment 1 0	
			AISCRAI J1939 61477 Aftert Aftertreatment 1 0	
			AISCRAI J1939 61477 Aftert Aftertreatment 1 0	
			Select Cancel	
Variable Watch				

You may now select or deselect the particular variable you wish to display by adding or removing a check mark **[v]** on the selection box to the left of the variable and left-clicking with the mouse button while the cursor is over the selection box. Once you are satisfied with your selections, left-click on the **[Select]** button to complete. If you wish to discard your selections and return to the **Variable Watch** widow simply left-click on the **[Cancel]** button.

7.21 Deleting Selected Items from the Variable Watch Window

If you wish to delete items from the **Variable Watch** window, you may highlight the item by right-clicking the particular item and either clicking the **[X] Delete Selected Items** icon from the **Variable Watch** window tool bar (as illustrated below) or by depressing the **[Delete]** key on the keyboard.

Vari	able Watch				
	🖌 🛃				
Pa	X Delete		Value	Units	Avg. Period 🛆
🧼 En	En Delete all celected items	e	0.000	kPa	
🧼 En	Delete all selected items	ture	0.000	С	
🧼 Bat	ttery Potential / Power Input 1	<i>*</i>	14.400	Volts	1000.05 ms
🧼 Eng	gine Speed		2196.000	rpm	20.03 ms
🧼 Eng	gine Throttle Position		32.800	%	99.99 ms
🧼 Eng	gine Fuel Rate		16.850	l/h	99.99 ms





7.22 Enabling Data Logging from the Variable Watch Window

You may enable the data logging feature to save the data to a file of your choice by selecting the **Enable Data Logging** icon from the **Variable Watch** window toolbar as illustrated below. This will log the incoming data for all variables on the **Variable Watch** window list to the file that you select.

	Variable Watch				
	😥 🗙 🛃				
	Parameter Enable Data Logging		Units	Avg. Period 🔨	Msg Coun
	Engine Inta Enable or disable data leading	n for	kPa		0
I	 Engine Inta all variables in this list. 	g for	С		0
I	Battery Pol		Volts	1000.05 ms	7
I	Engine Speed	2196.000	rpm	20.03 ms	344
I	Engine Throttle Position	32.800	%	99.99 ms	69
I	Engine Fuel Rate	16.850	l/h	99.99 ms	69
I					

7.23 Selecting the Destination File for Data Logging

After enabling data logging the following window will open, allowing you to select the file where you wish to save the data. The destination file should be entered in the format as illustrated below:

🦻 🗙 🛃			Data Logger Settings ×
Parameter Name > Engine Intake Manifold #1 Pressure > Engine Intake Manifold 1 Temperature > Battery Potential / Power Input 1 > Engine Speed > Engine Throttle Position > Engine Fuel Rate	Value 0.000 0.000 14.400 2196.000 32.800 16.850	Units KPa C Volts rpm % V	C:\Documents\VariableWatch\DATA.csv Browse C.\Documents\VariableWatch\DATA.csv Browse C.Logging Options C.Log each value as it is received along with its original timestamp C.Log all current values at a specified time interval Interval: 1000 ms Export Cancel

You may now enter the file name in the **Destination Filename** window on the **Data Logger Settings...** window, or select **[Browse...]** to locate a file you wish to save the data to. If you select **[Browse...]**, the software will take you to your computer storage options, allowing you to select the folder and select a unique filename for your data file (if desired). The data will be saved as a (*.csv) file. When you are satisfied with your settings, left-click on **[Export]**. If you want to discard your changes and return to the previous menu, left-click on the **[Cancel]** button.



7.24 Variable Watch Data Logging Options

You may select the Data Logging Options from the Data Logger Settings window. The options are:

- 1) Log each value as it is received along with its original timestamp
- 2) Log all values at a specified time interval

If you select **Log all values at a specified time interval** you may select the time interval in milliseconds by entering the value in the **Interval** field of the **Data Logging Options** window as illustrated below.

X 🛃			Data Logger Settings ×	
Parameter Name	Value	Units		
Engine Intake Manifold #1 Pressure	0.000	kPa	Destination Filename	
Engine Intake Manifold 1 Temperature	0.000	С	C:\Documents\VariableWatch\Data.csv Browse	
Battery Potential / Power Input 1	14.400	Volts		
Engine Speed	2196.000	rpm		
Engine Throttle Position	32.800	%	Logging Options	
Engine Fuel Rate	16.850	l/h	C Log each value as it is received along with its original timestamp	
			Log all current values at a specified time interval Interval: 1000 ms	
			Export Cancel	

When you are satisfied with the location and options, you may select the **[Export]** button to start logging your data. If you want to discard all of your selections and return to the **Variable Watch** window, you may select the **[Cancel]** button by clicking with the left mouse button.



8 PACKET WATCH FUNCTION BLOCK

To display the **Packet Watch** window, you may either right-click on the **Packet Watch** function block and select **[Show Packet Watch Window]** from the drop down menu, as illustrated below, or simply double-left-click on the **Packet Watch** function block.



The **Packet Watch** window will now open at the bottom of the screen as illustrated below.



acket Watch									f #
Prot.	ID	Abbreviation	Description A	Avg. Period	Msg Count	Msg/s	Max Period	Min Period	Last Received
J1939	65226	DM01	Active Diagnostic Trouble Codes	1000.01 ms	7	1.00	1000.26 ms	999.81 ms	6.26323
J1939	61455	AT1OG1	Aftertreatment 1 Outlet Gas 1		0				
J1939	64965	ECUID	ECU Identification Information		0				
31939	61444	EEC1	Electronic Engine Controller 1	20.03 ms	344	49.93	21.18 ms	18.82 ms	6.87648
J1939	61443	EEC2	Electronic Engine Controller 2		0				
J1939	65253	HOURS	Engine Hours, Revolutions	2000.06 ms	3	0.50	2000.06 ms	2000.06 ms	5.57216
J1939	61466	TFAC	Engine Throttle / Fuel Actuator Control Command		0				
J1939	65266	LFE	Fuel Economy (Liquid)	99.99 ms	69	10.00	100.61 ms	99.26 ms	6.88666







8.2 Deleting Packets from the Packet Watch Window

You may delete packets from the **Packet Watch** window by highlighting the particular variable by positioning the cursor over the variable you wish to delete, right-clicking with the mouse and selecting **[X Delete Selected]** from the drop down menu by left-clicking the mouse as illustrated below:

Prot.	ID	Abbrevia	ation	Descrip	ption 🕗	Avg. Period
3 J1939	65226	DM01	Active I		Diagnostic Trouble Codes	1000.01 ms
J1939	61455	AT10G1		Aftert	reatment 1 Outlet Gas 1	
📙 J1939	64965	ECUID	~	Delete Selected	fication Information	
👆 J1939	61444	EEC1	~	Delete Selected	Engine Controller 1	20.03 ms
J1939	61443	EEC2	à	Define PGN 64965	Engine Controller 2	
5 J1939	65253	HOURS		Goto definition	urs, Revolutions	2000.06 ms
- J1939	61466	TFAC		Reset Selected	ottle / Fuel Actuator Control Command	
- J1939	65266	LFE		Decet All	my (Liquid)	99.99 ms

8.3 Finding the Packet Definition

You may obtain the packet definition by right-clicking the desired packet and selecting [Goto definition] from the drop down menu as illustrated below:

Prot.	ID	Abbreviation	Description /	
J1939	65226	DM01	Active Diagnostic Trouble Code	2S
3 J1939	61455	AT1OG1	Aftertreatment 1 Outlet Gas 1	
📙 J1939	64965	ECUID	ECU Identification Informa	
5 J1939	61444	EEC1	Electronic Engine Controller	Delete Selected
J1939	61443	EEC2	Electronic Engine Controller	Define PGN 64965
J1939	65253	HOURS	Engine Hours, Revolutions	Goto definition
J1939	61466	TFAC	Engine Throttle / Fuel Actu	Reset Selected
J1939	65266	LFE	Fuel Economy (Liquid)	Denot All

The **CAN Database** will now open allowing you to obtain the definition for the specific packet.





8.4 Resetting Packets

You may reset the data of a specific packet or reset the data for all packets on the **Packet Watch** window by right-clicking the mouse on the desired packet and selecting either **[Reset Selected]** or **[Reset All]** from the drop down menu by left-clicking on the selection as illustrated below.

8.4.1 Reset Selected

Prot.	ID	Abbre	viation	Des	cription /	Avg. Period
📇 J1939	65226	DM01	DM01 A		ive Diagnostic Trouble Codes	1000.01 ms
븕 J1939	61455	AT100	51	Afte	ertreatment 1 Outlet Gas 1	
🚔 J1939	64965	Ecrito		FCI	Identification Information	
🝰 J1939	61444	E×	Delete Selected		ronic Engine Controller 1	20.03 ms
🖧 J1939	61443	E 💑	Define PGN 64965		ronic Engine Controller 2	
🚆 J1939	65253	F	Goto definition		e Hours, Revolutions	2000.06 ms
📩 J1939	61466	Т	Reset Selected		e Throttle / Fuel Actuator Control Command	
j J1939 65266	65266	L	Reset All		Economy (Liquid)	99.99 ms

8.4.2 Reset All

Packet Wate	:h					
Prot.	ID	Abbreviation	Description /			1
📇 J1939	65226	DM01	Active Diagnostic Trouble Codes			
J1939	61455	AT1OG1	Aftertreatment 1 Outlet Gas 1			
📙 J1939	64965	ECUID	ECU Identification Information	¥	Delete Selected	
📇 J1939	61444	EEC1	Electronic Engine Controller 1	<u> </u>	Delete Selected	
3 J1939	61443	EEC2	Electronic Engine Controller 2	50	Define PGN 64965	
📙 J1939	65253	HOURS	Engine Hours, Revolutions		Goto definition	
👆 J1939	61466	TFAC	Engine Throttle / Fuel Actuator O		Reset Selected	
🖏 J1939	65266	LFE	Fuel Economy (Liquid)		Reset All	



9 PACKET FILTER FUNCTION BLOCK

You may place a **Packet Filter** function block between a source device, such as an **ECOM** or **Recorder** block, and a passive interface, such as the **Graphing** function block. The **Packet Filter** block may be either a **Pass Filter** or a **Reject Filter**. A **Packet Filter** function block may be configured by right-clicking on the **Packet Filter** function block and selecting [**Configure Filter**] from the drop down menu by left-clicking the mouse on the selection as illustrated below.



The **Packet Filter Configuration** window will now open as illustrated below. From this menu you may select the type of filter you desire:

- Pass Filter forward only IDs in the filter list and block all others
- Reject Filter block IDs in the filter list and forward all others

Packet Filter C	Configuration		X
Dave Elber (forward and the top in the	Charles have been all and	
Pass Filter (torward only LDs in the	niter list, block all othe	rs)
Reject Filter	r (block IDs in the filter	list, forward all others)	1
		T Easure	d Error Managan
		Porwar	a Error Messages
E Protocol	ID A	Descri	ntion
L. HOLOCOI		Descri	
	-		
	There are no	items to show.	
		OK	Cancel





9.1 Adding a New Packet Filter

You may add a new filter to the **Packet Filter** window by right-clicking on the **Packet Filter** window and selecting **[Add New Filter]** by left-clicking the mouse on the selection as illustrated below:

	Packet Filter	Configuration		X
	Pass Filter (• Reject Filter	forward only ID r (block IDs in th	is in the filter list, block all other he filter list, forward all others)	s) Error Messager
Req. Transmitter	E Protocol	ID	Description	citor messages
P4		Add	Name Eilter	
	-	Cut Cop Accop	ivew Filter	
		Dele	ete	

The new filter will appear on the **Packet Filter Configuration** window as illustrated below:

Protocol	ID	Description	Error Messa
Raw	0		



To enter the message ID that you want to filter, double click under the **ID** column and enter the message identifier as follows:

• For a Raw Protocol Message enter the RAW Identifier (11-bit or 29-bit):

A		2		
Pack	et Filter C	onfiguration		X
P P	Pass Filter (f Reject Filter	orward only IDs (block IDs in the	in the filter list, filter list, forwa	block all others) rd all others) V Forward Error Messages
E.,	Protocol	ID	Description	
	Raw	201		
				OK Cancel

E Controls	®				CANcapture
• For a J1939 Protocol N	lessage ei	nter the PO	GN identifier:		
	Packet Filter	Configuration		x	
	 Pass Filter (Reject Filte 	(forward only IDs in r (block IDs in the f	n the filter list, block all others) filter list, forward all others)		
			Forward Error Me	ssages	
	E Protocol	ID 65227	Description		
			OK Can	cel	

You may enter a message description by double-clicking under the **Description** column and entering a description of your choice as illustrated below:

Pack	acket Filter Configuration X						
e F	Pass Filter (f Reiect Filter	forward only IDs in (block IDs in the fi	the filter list, block all others) ilter list, forward all others)				
			Forward Error Messages				
E.,	Protocol	ID	Description				
	J1939	65237	Alternator Information				
			OK Cancel				



9.2 Enabling / Disabling a Packet Filter

EControls°

You may enable or disable a packet filter by adding or removing the check mark [**v**] in the enable box under the [**E.**.] (enable) column heading by left-clicking the mouse when the mouse cursor is over the selection box as illustrated below.

			V Forward Err
E.,	Protocol	ID 🛆	Description
	J1939	65237	Alternator Informattion

9.3 Forwarding Error Messages

You may forward all error messages independent of the packet filter settings by selecting the **Forward Error Messages** selection box and adding a check mark **[v]** by left-clicking the mouse with the cursor over the selection box. To disable error message forwarding, remove the check mark **[v]** from the selection box by left-clicking the mouse with the mouse cursor over the selection box as illustrated below:

Packet Filter Configuration	x
 Pass Filter (forward only IDs in the filter list, block all others) Reject Filter (block IDs in the filter list, forward all others) 	
V Forward Error Mes	sages
E Protocol ID (Description	

EControls°



9.4 Selecting the Packet Filter Message Columns to be Displayed

You may select the information columns that will be displayed on the **Packet Filter Configuration** window by right-clicking on the column headings and selecting **[Columns** ▶] as illustrated below. You may select information columns that you want to display by adding a check mark **[v]** by clicking the left mouse button while the cursor is over the selection box to the left of the column heading on the drop down menu. To remove a selection, simply left-click the selection box that you want to remove until the check mark **[v]** is not visible.

Packet Filter	Configuration			х
 Pass Filter Reject Filter 	(forward only IDs er (block IDs in the	in th filte	e filter list, block all o r list, forward all oth	others) Jers)
			V For	ward Error Messages
E., Protocol	ID	D	escription	
Ra C	Columns 🔸	~	Enabled	
1	Arrange By 🔹 🕨	~	Protocol	
E	Best Fit	~	ID	
		~	Description	
			OK	Cancel



9.5 Selecting how the Packet Filter Display is Arranged

You may modify the order in which the packet filters are displayed on the **Packet Filter Configuration** screen by selecting **[Arrange by** ▶] selection on the drop down menu as illustrated below or merely right-clicking on the column heading.

The choices are:

- Enabled
- Protocol
- ID
- Description

Pa	ack	et Filter O	onfig	uratio	n		-		x
() F • F	Pass Filter (fi Reject Filter	orwar (block	d only i IDs in	IDs ir the f	n the filter list, l îlter list, forwa	block rd all (all oth others Forwar	ers)) rd Error Messages
[E	Protocol	ID	Δ	_	Description			
	V	Raw	0			Columns	•		
						Arrange By	•		Enabled
						Best Fit			Protocol
									ID
									Description
							OK		Cancel

You may also choose to let **CANCapture** decide how to display the **Packet Filter Configuration** screen by selecting [**Best Fit**] on the selection screen.





9.6 Completing the Packet Filter Configuration

When you are satisfied with the configuration of the **Packet Filters**, click on the **[OK]** button to accept all changes and return to the main window. If you want to discard your changes, right-click on the **[Cancel]** button as illustrated below:

	P	ack	et Filter O	onfiguration	2	×
) F	Pass Filter (fi Reject Filter	orward only IDs in (block IDs in the fi	the filter list, block all others) liter list, forward all others)	
		E	Protocol	ID 🛆	Description	
			J1939	65237	Alternator Informattion	
1						
					OK Cancel	



10 J1939 DIAGNOSTICS FUNCTION BLOCK

You may display the **Diagnostics (J1939)** function block window by right-clicking the mouse button on the **Diagnostics (J1939)** function block and selecting **[Show Diagnostics Window]** by left-clicking the mouse button on the selection (as illustrated below), or by simply double-clicking the left mouse button on the **Diagnostics (J1939)** function block.



The following window will appear, displaying the **Diagnostics (J1939)** information.

Workspace Chart Custom Panel Bus	Stats Raw Capture Diagnostics (J1939)				
DM Requests * 🗙					
Address	Last Reported	MIL	Stop	Warning	Protect /
0	26.549824	•	•	0	
Active DTCs Historic DTCs Pending	g DTCs Freeze Frames				
SPN	SPN Name	FMI		FMI Description	oc
Source Address: 0					
110	Engine Coolant Temperature	3		Voltage Above Normal, Or Shorted To High Source	2
105	Engine Intake Manifold 1 Temperature	3		Voltage Above Normal, Or Shorted To High Source	127
51	Engine Throttle Position	4		Voltage Below Normal, Or Shorted To Low Source	3
3673	Engine Throttle 2 Position	4		Voltage Below Normal, Or Shorted To Low Source	3
9 1	Accelerator Pedal Position 1	4		Voltage Below Normal, Or Shorted To Low Source	3
Q 29	Accelerator Pedal Position 2	3		Voltage Above Normal, Or Shorted To High Source	3
701	Auxiliary I/O #01	3		Voltage Above Normal, Or Shorted To High Source	127
100	Engine OI Pressure	3		Voltage Above Normal, Or Shorted To High Source	127
645		4		Voltage Below Normal, Or Shorted To Low Source	2
51	Engine Throttle Position	31		Condition Exists	3
Q 441	Auxiliary Temperature 1	3		Voltage Above Normal, Or Shorted To High Source	127
442	Auxiliary Temperature 2	3		Voltage Above Normal, Or Shorted To High Source	127



10.1 Selecting the Display Columns for the Diagnostics (J1939) Window

You may select the information columns to be displayed on the **Diagnostics (J1939)** window by rightclicking on the column headings and selecting from the drop down menu as illustrated below.

The choices are:

- Address
- Last Reported
- MIL
- Stop
- Warning
- Protect

Workspace Chart Custom Panel Bus Stats Ra	aw Capture Diagnos	tics	s (J1939)	
DM Requests * 🗙				
Address	Last F	lepor	orted	
2	Columns 🕨	~	Address	
	Arrange By	~	Last Reported	
	Best Fit	~	MIL	
		~	Stop	
Active DTCs Historic DTCs Pending DTCs	Freeze Frames	~	Warning	
SPN	SPN Na	~	Protect	

To select the columns that you want to display add a check mark [v] in the selection box preceding the selection by left-clicking the mouse with the cursor over the selection box. To remove an information column from the display, remove the check mark [v] from the selection box by left-clicking the mouse with the cursor over the selection box.





10.2 Changing the Arrangement on the Diagnostics (J1939) Window

You may change the arrangement of the indicators on the **Diagnostics (J1939)** window by right-clicking the mouse button on the column headings and selecting [Arrange By] from the drop down menu as illustrated below.

The choices are:

- Address
- Last Reported
- MIL
- Stop
- Warning
- Protect

EControls CANCapture - Diagnostics (J1939)			
File Edit View Flowchart User Panel			
i 🖪 🖆 di 🚅 🔮 🔂 🔮 🖓 🕒 I	a 🚽 🕹 🖓	BX090	🐐 📑 Hide/Show Windows 👻 🖂 Bring
K A ² m ≥ ~ 1 B B , 100%	Ad	d Function Block 🔪 👘	。
Workspace Chart Custom Panel Diagnostics (J1	.939)		
DM Requests * 🗙			
Address	Las	Reported	MIL
Co	lumns 🕨		
An	range By 🕨	Address	
Be	st Fit	Last Reported	
		MIL	
Active DTCs Historic DTCs Pending DTCs Free	ze Frames	Stop	
SPN /	SPN	Warning	
		Protect	
	-		



10.3 Clearing the Diagnostics (J1939) Indicators

You may clear all **Diagnostics (J1939)** indicators by right-clicking the mouse on the indicator window and left-clicking the mouse and selecting **[Clear All]** as illustrated below:

Workspace Chart Custom Panel Diagnostics	(J1939) Bus Stats Raw Capture		: \$ * 2 = 1 + 1 + 2 + 2 + 2 + 2 + 2 + 2 + 2 + 2 +	a tot XTI 🖻	
M Requests * 🗙					
ddress	Last Reported		MIL		Stop
	4.149376				
			Clear All		
		×	Clear Selected		
		•	Request Active DTCs (DM1)		
Active DTCs Historic DTCs Pending DTCs F	Freeze Frames	2	Request Historic DTCs (DM2)		
SPN	SPN Name	\$.	Request Pending DTCs (DM27)	FMI	
Source Address: 0			Request Freeze Frame (DM4)		
) 110	Engine Coolant Temperature		Request Active DTC Reset (DM11)	3	
) 105	Engine Intake Manifold 1 Temperat	Ire	Request Historic DTC Reset (DM3)	3	
51	Engine Throttle Position	_		4	
3673	Engine Throttle 2 Position			4	

10.4 Diagnostics (J1939) Tabs

There are four tabs on the **Diagnostics (J1939)** window as illustrated below.

These are:

- Active DTCs
- Historic DTCs
- Pending DTCs
- Freeze Frames

Active DTCs	Historic DTCs	Pending DTCs	Freeze Frames	
SPN 🗠				SPN Name

Source Address: 0



10.5 Selecting Columns to Display on the Diagnostics (J1939) Window

You may select the columns you want to display by right-clicking on the column headings and selecting [Columns ►] by left-clicking the mouse on the selection as illustrated below.

Active DTCs H	listoric DTCs	Pending D	TCs	Freeze Frames	
SPN 🔺					SPN Name
	Columns		~	[No Title]	
Source Addre	Arrange	By 🕨		Source Address	
29	Best Fit		~	SPN	ator
51 (1	SPN Name	Thro
51				EMI	Thro
91			H	EMI Description	Oil P
105			Ě	oc	Intak
110			Ľ	UL	Engine Cool
441					Auxiliary Ter

You may now select the **[Column** \triangleright] to display by adding a check mark **[v]** to the selection box preceding the column definition by left-clicking the mouse with the mouse cursor on the selection box. To remove a column from the display, you need to remove the check mark **[v]** from the selection box by left-clicking the mouse with the cursor on the selection box.

10.6 Selecting the Column Arrangement on the J1939 Diagnostic Window

You may arrange the columns on the **Diagnostics (J1939)** window by right-clicking on the desired column heading and selecting [Arrange By ▶] from the drop down menu as illustrated below, or by merely left-clicking on the desired column heading.

Active DTCs Historic DTCs Pending DTCs Freeze Fra	ames		
SPN X	SPN Name	Columns +	
Source Address: 0	-	Arrange By	[No Title]
29	Accelerator Peo	Best Fit	SPN
51	Engine Throttle Po	sition	SPN Name
51	Engine Throttle Po	ngine Throttle Position	
91	Accelerator Pedal	Position 1	FMI
100	Engine Oil Pressure	e	FMI Description
105	Engine Intake Man	ifold 1 Temperature	oc
110	Engine Coolant Te	mperature	





10.7 Options on the Diagnostics (J1939) Window

You may select the options for the various DTCs by right-clicking on the desired **DTC** and selecting from the drop down by left-clicking the mouse on the selection menu as illustrated below.

Active DTCs Hist	toric DTCs Pendi	ng DTCs	Freeze Frames		
SPN 🛆				SPN Name	
Source Address	: 0				
Q 29				Accelerator Ped	al Positio
51				Engine Throttle	Position
9 51		Goto De	finition		osition
91		Watch		•	Positio
100		Graph		•	re
105	42	Demuse	h Arthus DTCs (D	UH)	mifold 1
110	9	Reques	LACUVE DICS (D	(11)	emperat
4 41		Reques	t Active DTC Res	et (DM11)	ature 1
442		Clear Ad	tive DTC List		ature 2

The options are:

- Goto Definition
- Watch
- Clear Active DTC list

10.8 DTC Options

You may employ the various options on an individual DTC by right-clicking the mouse on the specific DTC and selecting the option you desire from the drop down menu by left-clicking on the selection as illustrated below:

29	_		_	Accelerator Pedal Position 2
51		Goto Definition		Engine Throttle Position
51		Watch		Engine Throttle Position
91		Graph		Accelerator Pedal Position 1
0 100		Graph	-	Engine Oil Pressure
105	•	Request Active DTCs (DM1)		Engine Intake Manifold 1 Temperature
110		Request Active DTC Reset (DM11)		Engine Coolant Temperature
9 441		Clear Active DTC List		Auxiliary Temperature 1
9 442			-	Auxiliary Temperature 2
9 645				
01 701				Auxiliary I/O #01
3673				Engine Throttle 2 Position



The choices are:

- Goto Definition
- Watch
- Graph
- Request Active DTCs (DM1)
- Request Active DTC Request (DM11)
- Clear Active DTC List

10.9 Selecting Goto Definition on the DTC Options Menu

You may select the **Goto Definition** option on the drop down menu by left-clicking the mouse on the **[Goto Definition]** Selection as illustrated below.

20	Tiddite		Accelerator Rodal Resition 2	
29		Cata Dafailian	Accelerator Pedal Position 2	
51		Goto Definition	Engine Inrottle Position	
51		Watch 🕨	Engine Throttle Position	
91 91		Graph	Accelerator Pedal Position 1	
100			Engine Oil Pressure	
105	0	Request Active DTCs (DM1)	Engine Intake Manifold 1 Temperature	
110		Request Active DTC Reset (DM11)	Engine Coolant Temperature	
9 441		Clear Active DTC List	Auxiliary Temperature 1	
9 442			Auxiliary Temperature 2	
9 645				
01 🕖			Auxiliary I/O #01	
3673			Engine Throttle 2 Position	


he CAN Database window will now open showing the definition for the DTC that is highlighted.	Co	n	tro	 S	®											CANca
1939 01403 NL3 0 0 Engine Throttle / Fuel Actuator Contro 1939 61466 TFAC 8 4 Engine Throttle / Fuel Actuator Contro 1939 61467 GPM17 8 0 General Purpose Message #1/7 1939 61468 RGAAC 8 1 Requested Generator Average Basic 1939 61469 SAS 8 Steering Angle Sensor Information 1939 61470 GC2 8 1 Generator Control 2 Aa 1939 61472 EBS25 8 0 Electronic Brake System #2/6 Aa 1939 61472 EBS25 8 0 Electronic Brake System #2/6 Aa 1939 61472 EBS26 8 0 Electronic Brake System #2/6 Aa 1939 61474 MSS 8 5 Machine Selected Speed J1939 61474 MSS 8 Aftertreatment 1SCR Dosing System E. Ingere Type Tingger Data J1939 61477 AISCR 8 Accelerator Pedal Posi Uns	CAN Dat	abas	se windo	w wi	ill n	ow	open showing	the	defi	nitio	n foi	r the	DTC tha	t is high	light	ed.
1939 61466 TFAC 8 4 Engine Throttle / Fuel Actuator Contro 1939 61467 GPM17 8 0 General Purpose Message #1/7 1939 61468 RGAAC 8 1 Requested Generator Average Basic 1939 61469 SAS 8 8 Steering Angle Sensor Information 1939 61470 GC2 8 1 Generator Control 2 Aa 31939 61471 EBS26 8 0 Electronic Brake System #2/6 Aa 31939 61472 EBS25 8 0 Electronic Brake System #2/5 1939 61474 MSS 8 5 Machine Selected Speed 31939 61475 A1SCR 8 4 Aftertreatment 1 SCR Dosing System 1939 61475 A1SCR 8 7 Aftertreatment 1 SCR Asing System 1939 61477 A1SCRAI 8 7 Aftertreatment 1 SCR Asing System 1939 61477 A1SCRAI 8 7 Aftertreatment 1 SCR Asing System 1939	5	89 J 1933	01400	NL3	٥	0	Engine knock Level #3									
Image: Second	8	Aa J1939	61466	TFAC	8	4	Engine Throttle / Fuel Actuator	Contro.								
Image: Second		Aa J1939	61467	GPM17	8	0	General Purpose Message #1/7	7								
1939 61469 SAS 8 Steering Angle Sensor Information 1939 61470 GC2 8 1 Generator Control 2 Aa 1939 61471 EBS26 8 0 Electronic Brake System #2/5 Aa 1939 61472 EBS25 8 0 Electronic Brake System #2/5 Aa 1939 61472 EBS25 8 0 Electronic Brake System #2/5 Aa 1939 61472 EBS25 8 0 Electronic Brake System #2/5 Aa 1939 61472 AISCR 8 4 Aftertreatment 1SCR Dosing System Aa 1939 61476 AISCR 8 3 Aftertreatment 1SCR Dosing System J1939 61477 AISCRAI 7 Aftertreatment 1SCR Ammonia Infor E Trigger Type Trigger Data J // Name By Bit Len Parameter Name Type Byte Scaling Offset Unit V 29 Accelerator Pedal Posi 2 1 8 Accelerator Pedal		Aa J1939	61468	RGAAC	: 8	1	Requested Generator Average	Basic								
In 1939 61470 GC2 8 1 Generator Control 2 Aa 1939 61471 EBS26 8 0 Electronic Brake System #2/6 Aa 1939 61472 EBS25 8 0 Electronic Brake System #2/5 Image: State Sta	3	Aa J1939	61469	SAS	8	8	Steering Angle Sensor Informat	tion								
Aa J1939 61471 EBS26 8 0 Electronic Brake System #2/6 Aa J1939 61472 EBS25 8 0 Electronic Brake System #2/5 Ma J1939 61472 EBS25 8 0 Electronic Brake System #2/5 Ma J1939 61474 MSS 8 6 Engine Speed Sensor Information Aa J1939 61474 MSS 5 Machine Selected Speed Ma J1939 61475 A1SCR 8 3 Aftertreatment 1 SCR Dosing System J1939 61477 A1SCRAI 8 7 Aftertreatment 1 SCR Dosing System Scaling Offset Unit Ma J1939 61477 A1SCRAI 7 Aftertreatment 1 SCR Ammonia Infor E Trigger Type Trigger Data De V 29 Accelerator Pedal Posi 5 1 8 Accelerator Pedal Posi Unsigned Little E 0.4 0 % V 29 Accelerator Pedal Posi 2 Accelerator Pedal Posi 1 8 Renote Acce		Aa J1939	61470	GC2	8	1	Generator Control 2									
As 11939 61472 EBS25 8 0 Electronic Brake System #2/5 11939 61473 ESSI 8 6 Engine Speed Sensor Information As 11939 61474 MSS 5 Machine Selected Speed Mailer 11939 61475 A1SCR 8 4 Aftertreatment 1 SCR Dosing System 11939 61476 A1SCR 8 3 Aftertreatment 1 SCR Dosing System Mailer By Bit Len Parameter Name Type Byte Scaling Offset Unit V 29 Accelerator Pedal Posi 5 1 8 Accelerator Pedal Posi 10.4 0 % V 29 Accelerator Pedal Posi 5 1 8 Accelerator Pedal Posi 1 0 % V 29 Engine Percent Load A 1 1 2 Accelerator Pedal Itol 0 % V 29 Engine Percent Load A 1 1 2 Accelerator Pedal Itol 0 %		Aa J1939	61471	EBS26	8	0	Electronic Brake System #2/6									
1939 61473 ESSI 8 6 Engine Speed Sensor Information Az 1939 61474 MSS 8 5 Machine Selected Speed Az 1939 61475 AISCR 8 4 Aftertreatment 1 SCR Dosing System J1939 61476 AISCR 8 3 Aftertreatment 1 SCR Dosing System Az 1939 61477 AISCRAI 8 7 Aftertreatment 1 SCR Ammonia Infor I Accelerator Pedal Posi 5 1 8 Accelerator Pedal Posi Unsigned Little E 0.4 0 % 9 91 Accelerator Pedal Posi 2 1 8 Accelerator Pedal Posi Unsigned Little E 0.4 0 % 9 92 Engine Percent Load A 3 1 8 Engine Percent Load A Unsigned Little E 1 0 % 9 558 Accelerator Pedal ILo 1 3 2 Accelerator Pedal ILo Unsigned Little E 1 0 bit 9 574 Remote Accelerator Pedal Kick 1 3 8 Remote Accelerator Pedal Kick Unsigned Little E 1 0 bit 9 974 Remote Accelerator Pedal Kick 1 3 8 Remote Accelerator Pedal Kick Unsigned Little E 0 4 0 % 9 1 Accelerator Pedal Kick 1 3 8 Remote Accelerator Pedal Kick Unsigned Little E 1 0 bit 9 579 Accelerator Pedal Kick 1 3 8 Remote Accelerator Pedal Kick Unsigned Little E 1 0 bit		Aa J1939	61472	EBS25	8	0	Electronic Brake System #2/5									
Aa J1939 61474 MSS 8 5 Machine Selected Speed Ab J1939 61475 ALSCR 8 4 Aftertreatment 1 SCR Dosing System J1939 61476 ALSCR 8 3 Aftertreatment 1 SCR Dosing System J1939 61476 ALSCR 8 3 Aftertreatment 1 SCR Dosing System J1939 61477 ALSCRAI 8 7 Aftertreatment 1 SCR Ammonia Infor I / Name By Bit Len Parameter Name Type Byte Scaling Offset Unit / 29 Accelerator Pedal Posi 5 1 8 Accelerator Pedal Posi Unsigned Little E 0.4 0 % / 91 Accelerator Pedal Posi 1 1 8 Accelerator Pedal Posi Unsigned Little E 1 0 % / 92 Engine Percent Load A 3 1 8 Engine Percent Pedal ILo Unsigned Little E 1 0 % / 559 Accelerator Pedal Kick 1 3 2 Accelerator Pedal Kick Unsigned Little E 1 0 % / 559 Accelerator Pedal Kick 1<		Aa J1939	61473	ESSI	8	6	Engine Speed Sensor Information	on								
Mai J1939 61475 A1SCR 8 4 Aftertreatment 1 SCR Dosing System J1939 61476 A1SCR 8 3 Aftertreatment 1 SCR Dosing System J1939 61476 A1SCR 8 3 Aftertreatment 1 SCR Dosing System J1939 61476 A1SCR 8 3 Aftertreatment 1 SCR Dosing System J1939 61477 A1SCRAI 8 7 Aftertreatment 1 SCR Ammonia Infor L / Name By Bit Len Parameter Name Type Byte Scaling Offset Unit 29 Accelerator Pedal Posi 2 1 8 Accelerator Pedal Posi Unsigned Little E 0.4 0 % 91 Accelerator Pedal Posi 2 1 8 Accelerator Pedal Posi Unsigned Little E 0.4 0 % 92 Engine Percent Load A 3 1 8 Engine Percent Load A Unsigned Little E 1 0 % 9 558 Accelerator Pedal Itol 1 3 2 Accelerator Pedal Kick Unsigned Little E 1 0 bit 9 559 Accelerator Pedal Kick 1 3 2 Accelerator P UnsignedL		Aa J1939	61474	MSS	8	5	Machine Selected Speed						i n	11		
1939 61476 AISCR 8 3 Aftertreatment 1 SCR Dosing System 103 1939 61477 AISCRAI 8 7 Aftertreatment 1 SCR Ammonia Infor 1 / Name By Bit Len Parameter Name Type Byte Scaling Offset Unit Image: Construction of the construction		Aa J1939	61475	A1SCR	8	4	Aftertreatment 1 SCR Dosing S	ystem					Req. Transmi	tter		
And 1939 61477 A ISCRAI 8 7 Aftertreatment 1 SCR Ammonia Infor I / Name By Bit Len Parameter Name Type Byte Scaling Offset Unit Image: Constraint of the state of the s		Aa J1939	9 61476	A1SCR	8	3	Aftertreatment 1 SCR Dosing S	ystem					2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-	* • • • >	ζ	
I Name By Bit Len Parameter Name Type Byte Scaling Offset Unit Image: Constraint of the state of t		Aa J1939	61477	A1SCR	AI 8	7	Aftertreatment 1 SCR Ammonia	a Infor				-	E Trigger Type	Trigger	Data I	De
29 Accelerator Pedal Posi 5 1 8 Accelerator Pedal Posi Unsigned Little E 0.4 0 % 9 1 Accelerator Pedal Posi 2 1 8 Accelerator Pedal Posi Unsigned Little E 0.4 0 % 9 1 Accelerator Pedal Posi 3 1 8 Engine Percent Load A Unsigned Little E 1 0 % 9 558 Accelerator Pedal I.Lo 1 1 2 Accelerator Pedal Kidk Unsigned Little E 1 0 bit 559 Accelerator Pedal Kidk 1 3 2 Accelerator Pedal Kidk Unsigned Little E 1 0 bit 9 974 Remote Accelerator P 4 1 8 Remote Accelerator P 4 0 %		I. 🛆	Name	B	y Bit	t Len	Parameter Name Ty	ype	Byte	Scaling	Offset	Unit 🔺	Recurrin	g every :	1.00 s [MC.
91 Accelerator Pedal Posi 2 1 8 Accelerator Pedal Posi Unsigned Little E 0.4 0 % 92 Engine Percent Load A 3 1 8 Engine Percent Load A Unsigned Little E 1 0 % 95 S58 Accelerator Pedal 1Lo 1 1 2 Accelerator Pedal 1Lo Unsigned Little E 1 0 bit 95 Accelerator Pedal Kick 1 3 2 Accelerator Pedal Kick Unsigned Little E 1 0 bit 974 Remote Accelerator P 4 1 8 Remote Accelerator P 04 0 %		29	Accelerator Pedal	Posi 5	1	8	Accelerator Pedal Posi Ur	nsigned	Little E	0.4	0	%	Single St	not after 0	.10 s (CI,
9 92 Engine Percent Load A 3 1 8 Engine Percent Load A Unsigned Little E 1 0 % 9 558 Accelerator Pedal 1Lo 1 1 2 Accelerator Pedal 1Lo Unsigned Little E 1 0 bit 9 559 Accelerator Pedal Kick 1 3 2 Accelerator Pedal Kick Unsigned Little E 1 0 bit 9 974 Remote Accelerator P 4 1 8 Remote Accelerator P 4 0 % V		91	Accelerator Pedal	Posi 2	1	8	Accelerator Pedal Posi Ur	nsigned	Little E	0.4	0	%				
• 558 Accelerator Pedal 11.01 1 1 2		92	Engine Percent Lo	ad A 3	1	8	Engine Percent Load A Ur	nsigned	Little E	1	0	%				
• 559 Accelerator Pedal Kidk 1 3 2 Accelerator Pedal Kidk Unsigned Little E 1 0 bit • • •		\$58	Accelerator Pedal	1Lo 1	1	2	Accelerator Pedal 1 Lo Ur	nsigned	Little E	1	0	bit				
9 974 Remote Accelerator P 4 1 8 Remote Accelerator P Unsigned Little E 0.4 0 %		559	Accelerator Pedal	Kick 1	3	2	Accelerator Pedal Kick Ur	nsigned	Little E	1	0	bit				_
Variable Watch Reg. Transmitter Packet V			Remote Accelerati	or P 4	1	8	Remote Accelerator P Ur	nsigned	Little E	0.4	0	% ▼	Variable Watch	Req. Transmitte	r Packet	v

10.10 Adding a New Variable Watch Window for the DTC

You may add a new Variable Watch window for a DTC by right-clicking on the specific DTC you wish to affect and selecting [Watch >] and then [New Variable Watch Window] by left-clicking the mouse on the selection as illustrated below:

COM /		i cor	Al Mann		ENT
SPIN A		58	N Nam	ie	FML
Source Adv	drager 0				
29		Acc	elerat	tor Pedal Position 2	3
51		Goto Definition	T	hrottle Position	4
51	-	Watch	+	New Variable Watch Window	31
91		Graph		Add to 'Variable Watch'	4
100	5	Reminest Active DTCs (DM1)	-		3
105	0	Request Active Drics (DH1)	In	itake Manifold 1 Temperature	3
110		Request Active DTC Reset (DM11)	C	oolant Temperature	3
441		Clear Active DTC List	TY	Temperature 1	3
442		Aut	xiliary	Temperature 2	3
645					4
701		Au	xiliary	I/O #01	3
3673		Enc	aine Th	hrottle 2 Position	4

The new Variable Watch window will open, displaying a new Variable Watch function block. The same new Variable Watch function block will appear on the Graphical Workspace Flowchart.

Variable Watch	h				1 4 ×	
2 × 🕄						
Variable	Value	Units	Avg. Period	Msg Count	Last Received	
Accelerator	. 0.000	%				Variable Watch
						~~
						Variable 111111
						J :

EControls°



To configure the DTC in the Variable Watch window, follow the instructions for the Variable Watch window described earlier in this manual. You will need to connect the new Variable Watch function block to your system as desired on the Graphical Workspace Flowchart using the Line Connector described earlier in this document.

10.11 Adding a DTC to a Variable Watch Window

You may add a DTC to a Variable Watch window by right-clicking on the specific DTC and selecting [Watch ▶] and then [Add to 'Specific Name'] from the drop down menu by left-clicking the mouse on the selection as illustrated below:

Custom Panel Diagnostics (31939) Bu	s Stats Raw Captu	re Workspace Chart	
DM Requests * 🗙				
Address			Last Reported	
0			2.869312	
	Ya. 1. 07	- Y	1	
Active DTCs Historic DTCs	Pending DT	Cs Freeze Frames		
SPN 🛆			SPN Name	
Source Address: 0				
() 29			Accelerator Pedal Pos	ition 2
9 51		Goto Definition		n
() 51		Watch	•	New Variable Watch Window
Q) 91		Graph	•	Add to 'Variable Watch'
100	45	Desugat Astron DT	Co. (DM4)	Add to variable watch
105	0	Request Active D1	LS (DM1)	1 Temperature
110		Request Active DT	C Reset (DM11)	rature
() 441		Clear Active DTC Li	st	1
A42			Auxiliary Tomporature	5

The DTC will be added to the **Variable Watch** window as illustrated below.

Active DTCs Historic DTCs Pending DTCs Freeze Fram	6						
SPN A	SPN Name		1	MI	FMI Description		oc
Source Address: 0							
0 29	Accelerator Pedal Position 2		3		Voltage Above Norma	I, Or Shorted To High Source	3
51	Engine Throttle Position		4		Voltage Below Norma	l, Or Shorted To Low Source	3
51	Engine Throttle Position		3	1	Condition Exists		3
Variable Watch							
🔉 🗙 😼							
Variable /		Value	Units	Avg. Period		Mag Count	Last Received
Accelerator Pedal Position 2		0.000	%				
Engine Intake Manifold 1 Temperature		214.000	С	499.68 ms		7	3.012864
Engine Speed		0.000	rpm	19.54 ms		158	3.139392
Engine Throttle Position		101.600	%	81.11 ms		33	3.114368





10.12 Adding the DTC(s) to a Graph Window

You may add DTCs to a **New Graph** window by right-clicking on the specific DTC and selecting **[Graph** ►] and then **[New Graph]** from the drop down menu by left-clicking the mouse on the selection as illustrated below:

Active DTCs Historic DTCs	Pending DTCs Freeze Frame	s						
SPN 🔺		SPN Name						FMI
Source Address: 0								
29		Accelerate '	~			1		3
51		Engine Th		Goto Definition				4
51		Engine The		Watch	→			31
91		Accelerato		Graph	-		New Graph	4
100		Engine Oil	ð	Request Active DTCs (DM1)			Add to 'Speed Graph'	3
105		Engine Int		Request Active DTC Reset (DM11)		-		3
110		Engine Co		Request Active DTC Reset (DHTT)				3
441		Auxiliary T		Clear Active DTC List				3
442		Auxiliary Ten	mpe	rature 2				3
E AE								4

A **New Graph** window and a **Graph** function block will appear on the **Graphical Workspace Flowchart** as illustrated below:



You may now configure the **New Graph** by referring to the **Graph Window Configuration** setting section described earlier in this manual. In addition you will need to connect the new **Graph** function block to the system using the **Drawing Pen** as described earlier in this document.





10.13 Adding DTCs to an Existing Graph Window

You may add a DTCs to an existing **Graph** window by right-clicking on the specific DTC and selecting **[Graph ▶**] and **[Add to '(specific name)' Graph]** from the drop down menu by left-clicking on the **[Add to** '(specific name) Graph'] as illustrated below.

Active DTCs Historic DTCs Pending DTC	s Freeze Frames
SPN 🛆	SPN Name
Source Address: 0	
 29	Annalasa Dadal Dasiking D
0.51	Goto Definition
51	with the second s
U 51	watch •
() 91	Graph New Graph
100	Request Active DTCs (DM1) Add to 'Speed Graph'
105	
110	Request Active DTC Reset (DM11)
441	Clear Active DTC List
442	Auxiliary Temperature 2
645	
701	Auxiliary I/O #01
3673	Engine Throttle 2 Position

The existing **Graph** window will now open showing the addition of your specific DTC(s) included to the graph.



You may now configure the **Graph** to your needs by referring to the **Configuring the Graph** window section presented earlier in this document.





10.14 Requesting Active DTCs

You may request Active **DTCs** by selecting right-clicking on the **DTC** list and selecting **[Request Active DTCs (DM1)]** from the drop down menu by left-clicking the mouse on the selection as illustrated below.

NOTES:

- 1. CANCapture must be running in order for these options to be available
- 2. This is only necessary if the ECU is not already broadcasting the Active DTCs.

Active DTCs	Historic DTCs	Pending DTCs	Freeze Frames		
SPN 🛆				SPN Na	ime
Source Add	ress: 0				
29	-			Acceler	ator Pedal Position 2
51		Goto Definition			hrottle Position
51		Watch			hrottle Position
91		Graph			tor Pedal Position 1
100	43	Desugat Active	DTC= (DM1)	0.55	il Pressure
105		Request Acove	DICS (DMI)		htake Manifold 1 Temp
110		Request Active	DTC Reset (DM1)	1)	oolant Temperature
9 441		Clear Active DT	C List		Temperature 1
442				Auxiliar	y Temperature 2
645					

This will send a request out of the output port on the J1939 Diagnostic function block to the CAN bus.

NOTE: The output port must be connected for this to operate properly.

The following Message will be sent out 65226 Active Diagnostic Trouble Codes per the J1939 protocol

Protocol	D /	Abry	Let	Vars	Description		Easter	not be share-	Sellers million	sorring is almost									
A# 31979	65196	EBC4			Wheel Brake Lining Remaining Informa	-	-						100.00	10010					
Ad 21939	65197	8803	8	1	Wheel Application Pressure High Rang		D	Time	Type	Priority	Oats Page	Reserved	1004	100-5	Source Add.	. Pgt	PD .	Data Langte	Data
22929	65298	AIR1	4	1	Ar Supply Pressure			8.000000	20.44				114	244	24.8	ACCORD.	410154141	1	1000010
8. J1939	65299	GFC		2	Puel Consumption (Gaseous)		100		11.01					4.55		and a	10007170		ALC: NOTE AND ALC: NOTE
12839	65200	1122	20	5	Trip Time Information 2														
Az 22939	65201	81	8	2	ECU History														
J2939	65202	OFT1		3	Puel Information 1 (Gaseous)														
31939	65203	UR		2	Puel Information (Jugukt)														
12929	65204	TTES	16	. 4	Trip Time Information 1														
Ap 32939	65205	151	4.	040	Trip Shutdown Information														
#a 22929	65206	TVE .	8	1	Trip Vehicle Speed/Cruse Distance Inf		PGN 59	904					Re	quest					
22829	65207	9	30	1. B	Engne Speed/Load Factor Information		Times	tamp: 0.00000											
Au 12939	65208	Cast	22	6	Trip Fuel Information (Geseous)		Data L	ength 3											
J1979	65209	1447	22	6	The Fuel anformation (Liquid)		Dete	CA FE 00											
119.39	65210	TOS	12	3	Trip Distance Information		3 SAL 11	939 protocol d	ata unit (PDU	Economic and the second se									
22939	65211	175	26		Trip Fan Sittereation		1 B Pr	rameter Group	Number (PG	ND: 59904 (DuEA	100)								
129.79	65212	CR	15		Compression/Service Brake Sylormation		1.1.1.1	Priority: 6											
11870	00213	NU NUCA			Figure Provide Constrainty of			Data Page 0											
111.20	65224	EEC.*	-		Electronic Engine Controller 4			Reserved 0	111.01.01.01										
12929	65215	107.4	-		Ten in Mension			PDU Fermati	234 (DBA) 255 (D4E)										
110.00	45317	JOH ST	-		Mark Result day Vehicle Performen			Score Addre	= 255 (D.FF)										
1020	00227	10.03	-		Participa Retroduc Carbodas 2														
11979	44719	BRUS .			Electrony Transmission Controller 5		1	ansmission Rep	etition: Per u	uer requiremen	ts, generally H	commended	that requests	eccur no mor	e than 2 or 3 time	s per secon	d.		
1:470	65720	69622	-	0	Reserved for NO 11997		De	fault Data Len	pthc 3		1950.010		100000						
229.79	65221	FTCA	-	2	Flactborg Transmisson Controller 4		- De	fault Priority: 3											
11929	65222	68523		0	Reserved for 25O 11992		- 115	139 PGN 59904	(b.£.400)										
21939	65223	FTC3		17	Fectory Transmon Controler 3		- 18 Ve	riable Informat	sion.										
12929	65224	GPM22		0	Reserved for 250 11992			Parameter Gri	oup Number	(RQST)									
Am 21929	65225	68512		0	Reserved for 25O 11992		Variable	Name Para	meter Na	Value									
Au 31339	85228	CHICI	65535	12	Active Diagnostic Trouble Codes		Paramete	r Grou Para	meter Gro	85226.000									
La 32929	65227	DM02	65535	12	Previously Active Diagnostic Trouble C														
12939	65228	DM03	0	0	Diagnostics Data Clear,Reset for Previ														
11939	65229	DM04	65535	. 6	Process Prame Parameters														
I P None		By Bt.		Parameter Nam	e Type Byte Scaling	of -													
→ 623 Red St	top Lanp	1 5	2 1	Red Stop Lanp	Unsigned Little E 1	0													
@ 624 Anber	Vianning Land	1 3	2 4	Anther Warning	Lanp Unsigned Little E 1	0													
9 987 Protect	1Lanp	1 1	2 1	Protect Lamp	Unsigned Little E 1	0													
A 1713 Multin	uction Indicator L	.1 7	2.)	Mailunction Inde	cator Lamp Unsigned Little E 1	0													
A 1979 - 1984			19 1	Suspect Parane	ter famber Unsigned Little E 1	0													
♀ 1214 Support	Ct Parameter Nu.																		
 1214 Suspect 1215 Falure 	ct Parameter Nu. Mode Identifier	5 1	5 /	Failure Mode Ide	entifier Unogned Little E 1	0.W													





10.15 Requesting an Active DTC Reset (DM11)

You may request an **Active DTC Reset (DM11)** by right-clicking on the DTC list and selecting **[Request Active DTC Reset (DM11)]** by left-clicking the mouse on the selection as illustrated below.

Heave bres Historic b	res rendin	ig or commence interest interest	
SPN 🔺		SPN Name	
Source Address: 0			
29		Accelerator Pedal Positi	ion 2
51		Cata Definition	
51		Goto Dennition	
91		Watch	•
100		Graph	+
105	•	Request Active DTCs (DM1)
110		Paguast Active DTC Pa	acat (DM11)
441		Request Active DTC Re	eset (DMTT)
		Clear Active DTC List	

This will send the request out of the output port of the J1939 Diagnostic function block.

NOTE: You must have the output port of the **J1939 Diagnostic** function block connected to the system.

The following will be sent out 65235 Diagnostic Data Clear Reset for Active DTCs per the J1939 protocol

AA TRANSPORT - GH	Course of the					Sec. 1	I we speed Charly De	Contra Division	mane Capture			_	_		_		_	_	
4 8 9 -						_			QAX Films, Dr.	e Piller Tavi									_
toted ID	0 1	Abry	3.01	1945	Description		Capitary must be along	al before column	artic salara										
1939 45	5225	59512		0 B	Reserved for 290 11992		2) Time	Tuter	Priority -	Data Page	Americal	PED/F	MALE.	Sincle AM	221	RD .	Ceta Lender	2418	
1939 65	\$228	0H01	65535	42	Active Diagnostic Trouble Cades		0.00000	20.44				1724	100	165	Ninet-La	******		Tes Inda	
1939 65	\$227	24403	65535	10	Previously Active Degroutic Trouble Calles							445	100		1000	100071010		211 2240	-
1929 65	\$228	04403	4		Overventra Dete Deer Alexet for Previously		-												_
1939 65	8329	OHON	435,75		Process France Parlameters														
(830 83	8330	0405	43535		Diagnostic Readmens 1														
1929 65	\$131	09408	43535	12	Pending Office														
1879 65	\$232	09408	43575	1	Test Results for Non-continuously Monitored .														
1939 65	\$233	09409	65535	.0	Oxygen Senser Test Results														
1539 65	5234	CH10		- 1	Non-continuously Horntored System Test Ide														
28.79 EL	6205	OMIL	43535		Diagnostic Data Oner Raset for Active DICs		PG8 59904												
1929 65	6236	CPH12	45535	12	Emasons Related Active DTCs		Transforme 0.000	÷											
1929 65	6237	45		-5	Alternator Information		Date Length 1	-											
			1.2	out consider	 A	in the second	frank condition is												
Turne		Tr Bt.	There	e no dens to r	Ann.	one	Data: D3 FE 00 SAE 1593 protoco Parameter Geo Pronty: 6 Data Page: Reserved 5 PDU-Form PDU-Form	r data unit (PD) op Number (PD 8 e: 234 (InitA) or 234 (InitA)	1 26 5993 (54)	201									
, nee		Fr., 84	There	e no itema te r		,	Date: DJ FE 00 SAE 2,819 protecto Parameter Geo Parameter Geo	r data unit (PDI) op Number (PD 8 er 234 (DelCA) for 235 (DelF) forse 235 (DelF)	8 26 39904 (545)	80									
gettes		Fr., 84.	There	e no riterita la r		-	Date D 76 00 SAE 28/9 perfoce Parameter Geo Prochy 6 Data Page Reserved 5 POU-Form POU-Spect Source Add © RQST	data unit (PD) aj Number (PD 8 e: 234 (bit34) ic: 255 (bit7) ress: 255 (bit7)	л 26 3994 р.с.	89									
perfers 21		Pr 10.	Treta	e no riterita ta s		- +	Dete C0 FE 00 SAE 2820 protoco Parameter Geo Pronty: 6 Deta Page Reserved 1 POU-Seen POU-Seen POU-Seen Four Add RQST Transmission P	data unit (PD) gi Number (PD) e 234 (De(A) to 255 (DeF) tess 255 (DeF) tess 255 (DeF) tess 1	8 20; 59904 (542 1 	00) Ex. generally re	commended	flat requests	occur no men	e than 2 or 3 time	s per secces	4			
orties 21 schet Identifica	tion	Pr BL.	There a	e no riterna lla r		+	Dete: C0 76 00 Self 2000 protoco Parameter Geo Priority 6 Deta Page Reserved 5 POU-Form POU-Spect Source Add R ROST Transmission / Default Data L Default Data L	data unit (PD) gi Number (PD) a 234 (DelA) lo: 255 (DelP) less: 255 (DelP) less: 255 (DelP) less: 255 (DelP) less: 255 (DelP)	Л 24) 39904 (542) 1 1	00) ts. generally re	commended	that respects	scur no men	e than 2 or 3 time	s per uncons	4			
orties 21 schet Mentifikat	ation	Pr 84.	There a	e no riterna he r	100 (100) (200 Ann	-	Dete E0 FE 00 SAE 0399 protoco Parameter Geo Privety: 6 Deta Page Reserved 5 POU-Form POU-Seed Source Add Cefault Poops Default Poops POU-Seed Source Add	t data unit (PDI op Number (PD 8 er 234 (DeEA) icr 255 (DeFF) iesus 255 (DeFF) iesus 255 (DeFF) iesus 255 (DeFF) iesus 10 (DeFF) is politikani. Per o night 3 i ()	Л 24) 39904 (542) 1 247 гецинения	00) Ex. generally re	commended 1	thet requests	occur no mon	e than 2 or 3 time	s per secces	a.11			
ontine 21 22 N Take N Take	ation	Pr 84.	There are	10 10 10 10 10 10 10 10 10 10 10 10 10 1	100 Julio Julio Julio Anno 201	-	Deter DJ FE 00 SAE 8399 pertoco Paramete Geo Prostip: 6 Deta Page Reserved 5 POU-Form POU-Seed Source Add Befault Data II Default Data II Default Proofs S205 PCAI 900 Vandeb Default	data unit (FD) op Number (FD 8 er 234 (SeEA) or 255 (SeFF) fesse 255 (SeFF) apetition: Per o right 3 (3) 94 (SeEA0) official	Я 245 39904 (5423 1 1	00) ti, generally re	commended t	fat migants	occur no men	e than 2 or 3 time	s per secces	4			
orties § J schet Identificat det Protocol N Value CA2000 Paul Paul	ation	Fr 10.	There are	e no Remi le r SAC 32 162211 False	100 Julio Julio Julio Mark	•	Ceter D1 FE 00 S42 5393 protecto 2: Planette Cito Planette Cito Planette Cito Planette Cito PO-1 Spect Sourix Adi Default Data Is Default Data Is Default Planet D1 Sunstantiano D1 S	t data unit (PDI gi Number (PD 8 e: 234 (DeEA) ic: 255 (DeFF) iesus 255 (DeFF) iesus 255 (DeFF) iesus 255 (DeFF) iesus 255 (DeFF) iesus 255 (DeFF) ic: 255 (DeFF) iesus 255 (DeFF) ic: 255 (DeFF)	8 245 59904 (5423 1 246 14523)	00) ti, generally re	commended 1	fiel requests	accur no mon	e than 2 or 3 time	s per secces	4			
orties 11 chet Identifica det Protool N take 42200 Fan Pad det Azonyn	ation	Fr, 80.	There are	e so Rem la r SAE JU SAE JU SAE JU SAE JU SAE JU SAE JU	100 July 1 July 1 July 1		Ceter DI FLO SAL 8399 persono Parameter Gro Parameter Gro Porty 6 Oral Parameter Gro Porty 6 Porty 6 Po	t data unit (PD) gi Number (PD) at 234 (De(A) Ic 255 (D4F) ress 255 (D4F)	8 245 39904 (546) 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	00) ta, generally re	convended 1	hel migants	occur no mon	e than 2 or 3 time	s per secces	a.33			
perfires 2 2 det Protocol N Take 6A2000 Fast Pad Set Accorden ert Description	atten	Fr 80.	There are	e no Remi la r SAC JU 652211 Falsa Dina Despro	100 view view view		Date D145 00 S44 (339) persons Parameter Circle Parameter Circle Parameter Circle Parameter POS-Spect Source Add POST Default Date Li Default Date Li	data unit (PD) op Number (PD e e 234 Gel A) ic: 255 (SuFF) iesu 255 (SuFF) iesu 255 (SuFF) iesu 255 (SuFF) iesu 255 (SuFF) of (SuFF) iesu 255	A 24) 39904 (542) 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	00) EL gerendy a	commended 1	thef requests	occur no men	e than 2 or 3 time	s per secces	a .31			
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10.16 Clearing the Active DTC List

You may **Clear the Active DTC List** by right-clicking on any of the DTCs on the list and select **[Clear Active DTC List]** from the drop down menu by left-clicking the mouse on the **[Clear Active DTC List]** selection as illustrated below.

Active DTCs	Historic [otCs	Pending DTCs	Freeze Frames		
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Source Addr	ess: 0					
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51		Goto	Definition			ne Throttle Position
51		Wat	ch		•	ne Throttle Position
91		Gran	h		•	elerator Pedal Positio
100	-		and Article DTC	(0111)		ne Oil Pressure
105	•	Req	Jest Active DTC	s (DMI)		ne Intake Manifold 1
110		Req	Jest Active DTC	Reset (DM11)		ne Coolant Tempera
441		Clea	r Active DTC Lis	t		liary Temperature 1
442					Aux	xiliary Temperature 2
645						

All active DTCs will now be cleared from the list.

NOTE: This does not send a CAN message to clear or reset DTCs. It simply clears the items from the list.





11 REPLAY RECORDER FUNCTION BLOCK

You may set up the replay recorder by either right-clicking on the mouse on the **Replay Recorder** function block and selecting **[Properties]** in the drop down menu by left-clicking on the selection as illustrated below or simply double clicking the left mouse button on the **Replay Recorder** function block.

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	1.1.1 P	Reg. Transm	itter			import Selection			
						Export Selection	1		
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The **Properties** window will now open displaying all the settings for the recorder block.

EControls CANCapture - Properties		- * ×
File Edit View Flowchart User Panel		Options 😥
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Z ·		
Block Settings Bick Enabled	Exica	
Box Cation	Reniav Recorder	
Caption Visible	True	
Replay Recorder Settings		
Save to Filename	Examples Weplay Files UdeECU_NoEngine_ManyOTCs_J1939.cpf	
Alow File Overwrite	False	
Compression Level	Best	





11.1 Saving Can Message Data

You may now select the file you wish to save the CAN message data to by selecting the [...] icon at the far right-hand side of the **Save to Filename** setting as illustrated below:

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Workspace Chart / Diagnostics (J1939) / Raw Capture / Properties		3 () X
21		
Block Settings		
Block Enabled	False	
Block Caption	Replay Recorder	
Capton Visible	True	
Replay Recorder Settings		
Save to Filename	C: Users Richard K. Rader Documents (CAN Messages.cpf	
Alow Re Overwrite	False	
Compression Level	Best	
	Receive Fraces 2320 Windonysieve Buttoch Buttoch Company File Buttoch Buttoch Company File Buttoch Company Buttoch Buttoch Buttoch Bu	
	File name: CAN Messages opt - Open	

You may now select the file you wish to save your data to from the widow illustrated above. The file will be stored in the *.cpf (Can Playback File) format.

11.2 Selecting the file Overwrite option

You may select the **Allow File Overwrite** option by left-clicking the mouse on the [▼] icon on the far right hand side of the **Allow File Overwrite option** selection as illustrated below:

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	(Workspace Chart) Diagnostics (21939) Raw Capture Properties		3 4 Þ ×	
	24			
L	Block Settings			
н	Slock Enabled	False		
н	Biok Capton	Replay Recorder		
н	Capton Visible	True		
н	Replay Recorder Settings			
н	Save to Pilename	C: Users'Richard K. Rader'Documents'CAN-Messages.cpf		
н	Allow File Overwrite	False		
н	Compression Level	True		
н		False		
н				

You may now select either **True** or **False** from the drop down menu by right-clicking on the selection. If you select **False** the data file will be protected from being overwritten at a later date. If you select **True**, the file may be overwritten and you will lose all previously recorded data every time a new capture is started.





11.3 Setting the Level of Compression of the Data File

You may set the level of compression of the data of your file by right-clicking the mouse on the [▼] on the far right-hand side of the **Compression Level** selection as illustrated below:

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🖌 A® 网络小小 📗 (1995) 🙀 100% 🔹 🐂 🗡 Add Function Block * (1915) 👘 🚊 🖄 🚸 🔛 🗐 🖓 🖓 🖓 🖓 👘 👔 👘	
Workspace Chart / Diagnostics (J1939) Raw Capture / Properties	\$45×
24	
Block Settings	
Block Enabled	False
Block Caption	Replay Recorder
Capton Visible	True
Replay Recorder Settings	
Save to Filename	C: Users'Richard K. Rader'Documents'CAN-Messages.cpf
Allow File Overwrite	False
Compression Level	Best 💌
	Fastest
	Fast
	Normal
	Good
	Best

You may now select the amount of data compression you want from the drop down menu by left-clicking your selection with the mouse. The **Fastest** selection will provide the best performance but the least amount of compression, while the **Best** selection will provide the highest amount of compression. All other selections are somewhere in between these settings.





12 LIVE REPLAY FUNCTION BLOCK

You may configure the parameters of the file replay block by right-clicking the mouse button on the **Replay** function block and selecting **[Properties]** from the drop down menu by left-clicking on the **[Properties]** selection as illustrated below or simply double clicking on the **Replay** function block.



The following window will now open:

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File Edit View Flowchart User Panel	Options	0
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21		
Rock Settings		
Block Enabled	True	
Biock Caption	ECU Recording	
Capton Visble	True	
Live Replay Settings		
Replay Filename	Examples/Replay Files/OnlyECU_NoEngine_ManyOTCs_)1939.cpf	
Playback Speed	1x	
Misc. Settings		
Enable Multipacket Support	True	
J1939 Multpacket support	True	
NMEA2000 Fast-Packet support	True	
Multipacket Error Messages	True	
Multipacket Warning Messages	True	
Error Messages	True	





12.1 Enabling / Disabling the Live Replay Function Block

You may Enable or Disable the **Live Replay** function block from this window by selecting the **Block Enabled** line and left-clicking on the [▼] icon on the far right-hand side of the line and selecting either **True** or **False** from the drop down menu as illustrated below:

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Box Caption	True
Capton Visble	False
Live Replay Settings	
Replay Filename	Examples/Replay Files/Only60J365rgne_Many070s_31939.cpf
Playback Speed	14
Hisc. Settings	
Enable Multipacket Support	True
31939 Multpacket support	True
NMEA2000 Fast-Packet support	True
Hultpacket Error Messages	True
Multipacket Warning Messages	True
Bror Messages	frue

12.2 Modifying the Replay Block Caption

You may modify the **Live Replay** function block caption by selecting **Block Caption**, then hold down the left-hand mouse button while cursoring over the portion of the caption (or the entire caption) that you wish to modify to highlight it, then enter the caption content that you desire to display on the flowchart as illustrated below.

EControls CANCapture - Properties	
File Edit View Flowdhart User Panel	
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Workspace Chart / Diagnostics (J1939) / Raw Capture / Properties	
24	
Block Settings	
Block Enabled	True
Block Caption	Previous Data Recording
Caption Visible	True
□ Live Replay Settings	
Replay Filename	Examples\Replay Files\LongBoatSession_NMEA2000_J1939.cpf
Playback Speed	1x
Misc. Settings	
Enable Multipacket Support	True
J1939 Multipacket support	True
NMEA2000 Fast-Packet support	True
Multipacket Error Messages	True
Multipacket Warning Messages	True
Error Messages	True



EControls°

12.3 Selecting if the Caption is Visible

You may select if the **Caption** is visible or not by selecting the **Caption Visible** option under **Block Settings** and left-clicking on the [▼] icon at the far right-hand side of the **Caption Visible** line. Then, select from the drop down menu either **True** to make the Caption visible or **False** to make the caption invisible on the flowchart as illustrated below:

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Block Settings	
Block Enabled	True
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Hist. Settings	
Enable Multpacket Support	True
31939 Multpacket support	True
NMEA2000 Fast Packet support	True
Multipacket Error Messages	True
Multipadiet Warning Messages	True
Bror Messages	The

12.4 Selecting the Data File to Playback

To select the data file that you have previously recorded for playback select the [...] icon on the far righthand side of the **Replay Filename** line under **Replay Settings** by left-clicking with the mouse as illustrated below:

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Block Settings									
Block Enabled				due.					
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You may then browse your computer storage for the file that you wish to replay and select open by rightclicking the mouse on the **[Open]** icon.



12.5 Setting the Playback Speed

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You may select the desired playback speed of your data by selecting **Playback Speed** under **Live Replay Settings** and left-clicking on the [▼] on the far right-hand side of the window and selecting the desired **Playback Speed** from the drop down menu as illustrated below or by double clicking on the **Playback Speed** to cycle through the various choices.

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NHEA2000 Fast-Packet support	1x
Nultpacket Error Messages	24
Multipacket Warning Messages	24
Dror Messages	58
	20
	208

12.6 Miscellaneous Settings for the Playback Block

You may choose which **Miscellaneous Setting** you wish enabled or disabled by selecting the [\checkmark] icon at the far right-hand side of the selection and selecting either **True** or **False** from the drop down menu by left-clicking the mouse on the selection as illustrated below this will toggle the selection between **True** and **False** each time you double click. You may also double-click the option to toggle between **True** and **False**.

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13 11-BIT AND 29-BIT MESSAGE TRANSMITTER FUNCTION BLOCKS

You may configure the various parameters of the **Message Transmitter** function blocks by right-clicking the mouse on the function block and selecting **[Configure Transmitter]** from the drop down menu as illustrated below, or by simply double clicking on the **Message Transmitter** function block.



The following window will open, displaying the configuration parameters of the **Message Transmitter** function block.

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	Workspace Chart Dia	agnostics (J1939)	Raw Capture Re	q. Transr	nitter			-											
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E	Trigger Type	Trigger Data	Description	PDU-F	PDU-S	SA	Priority	DP	R	PGN	Data Length	Data 1	Data 2	Data 3	Data 4	Data 5	Data 6	Data 7	Data 8
	Recurring	every 1.00 s	DM1/DTC Request	234	0	255	0	0	0	59904	3	202	254	0	255	255	255	255	255
Б	Single Shot	after 0, 10 s	CI/ID Request	234	0	255	0	0	0	59904	3	235	254	0	255	255	255	255	255





13.1 Selecting the CAN Data Column Display Format (29-bit Only)

You may toggle the display format for your CAN data in the columns by left-clicking the mouse on the **J1939 Columns** selection on the toolbar of the **Message Transmitter** window as illustrated below. The data display format will toggle between **J1939** and **Raw 29-bit identifier** each time you click on the selection.

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	E 10	1929 J 1939 Columns	C Request	234	0	255	0	0	0	59904	3	202	254	0	255	255	255	255	255
1	⊠ ()	Toggle between displaying the raw 29-bit CAN ID and specific J1939	C Request	234 234	0 0	255 255	0	0 0	0	59904 59904	3 3	202 235	254 254	0	255 255	255 255	255 255	255 255	255 255

13.2 Adding a New Transmit Message

You may add a **New Transmit Message** by left-clicking the mouse on the **envelope** icon in the **Transmitter** window toolbar as illustrated below.

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	1959 Hex 🔏 🗈 🖹 🗙																	
E	Trigger Data	Description	PDU-F	PDU-S	SA	Priority	DP	R	PGN	Data Length	Data 1	Data 2	Data 3	Data 4	Data 5	Data 6	Data 7	Data 8
	New Message	DM1/DTC Request	0xEA	0x00	0xFF	0	0	0	0xEA00	3	0xCA	0xFE	0x00	0xFF	0xFF	0xFF	0xFF	0xFF
	Creates a new default transmit	CI/ID Request	0xEA	0x00	0xFF	0	0	0	0xEA00	3	0xEB	0xFE	0x00	0xFF	0xFF	0xFF	0xFF	0xFF
	message - be sure to enable it when ready to send.									•								

13.3 Displaying the Data in Hexadecimal

You may display the CAN Data in hexadecimal by left-clicking the mouse on the **[Hex]** selection in the **Message Transmitter** window toolbar as illustrated below. The display will toggle between **decimal** and **hexadecimal** each time you left-click the mouse on the selection.

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13.4 Setting the Trigger Type

You may set the type of trigger for your request transmitter by double-clicking on the trigger type window and then left-clicking on the $[\mathbf{\nabla}]$ icon to and selecting the trigger type from the drop down menu as illustrated below:

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Trigger Type 💎	Trigger Data	Description	PDU-F	PDU-S	SA	Priority	DP	R	PGN	Data Length	Data 1	Data 2	Data 3	Data 4	Data 5	Data 6	Data 7	Data 8
Trigger Type: Single	Shot																	
Single Shot	- er 0.10 s	CI/ID Request	234	0	255	0	0	0	59904	3	235	254	0	255	255	255	255	255
Hot Key Single Shot	-																	
Recurring	every 1.00 s	DM1/DTC Request	234	0	255	0	0	0	59904	3	202	254	0	255	255	255	255	255

The choices are Hot Key, Single Shot, or Recurring.

13.5 Selecting the Hot Key for Triggering the Message Transmitter

To select the specific **Hot Key** for triggering the **Message Transmitter**, double click on the **Hot Key** option. When the **Select Hot Key...** window opens, depress the specific keyboard key(s) you wish to be the **Hot Key**(s), as illustrated below. When you are satisfied with your selection, left-click on the **[OK]** button. If you want to discard your changes and return to the Message **Transmitter** configuration window, left-click on the **[Cancel]** button.







13.6 Selecting a Single Shot Trigger

You may select a **Single Shot** by double clicking on the **Trigger Type** option and selecting the [▼] icon and selecting **[Single Shot]** from the drop down menu as illustrated below:

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PDU-F: 0																		
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Single Shot	- er 0.00 s	MY MESSAGE	255	0	255	0	0 0	65280	3	202	254	0	255	255	255	255	255	
Hot Key Single Shot Recurring																		

13.7 Selecting a Recurring Trigger

You may select a **Recurring Trigger** by double clicking on the **Trigger Type** window and then left-clicking on the $[\mathbf{\nabla}]$ icon and then selecting **[Recurring]** as illustrated below.

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E., Trigger Type	Trigger Data	Description	PDU-F 🛆	PDU-S	SA	Priority	DP	R	PGN	Data Length	Data 1	Data 2	Data 3	Data 4	Data 5	Data 6	Data 7	Data 8
PDU-F: 0																		
🖂 🕂 Hot Key	None	New transmit me	0	0	0	0	0	0	65535	8	255	255	255	255	255	255	255	255
PDU-F: 255																		
Recurring	- sry 0.00 s	MY MESSAGE	255	0	255	0	0	0	65280	3	202	254	0	255	255	255	255	255
Hot Key Single Shot Recurring																		

13.8 Setting the Time Interval for a Recurring Message

You may set the time interval of the reoccurring message by double clicking the **Trigger option** window by left-clicking the mouse and entering the time interval in seconds.

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orkspace Chart D	agnostics (J1939)	Raw Capture Rev Description DM1/DTC Request	pDU-F	PDU-S	SA 255	Priority 0	DP 0	R PG	N Di 904 3	Data Length	Data 1 202	Data 2 254	Data 3 0	Data 4 255	Data 5	Data 6	Data 7	Data 8 255





13.9 Setting the Time Delay for a Single Shot Trigger

You may set up the time delay for the **Single Shot Trigger** by double clicking on the **Trigger Data** option and entering the **time delay** in seconds as illustrated below. The **time delay** is from the start of the capture.

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■ PDU-F: 255															
C Single Shot 1.00 MY MESSAG	255	0 25	5 O	0	0	65280	3	202	254	0	255	255	255	255	255

13.10 Entering the Message Description

You may enter a **Message Description** by left-clicking on the **Description** window and typing in a description of your choice as illustrated below.

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Description: MY MESSAGE															
🖂 🎲 Recurring every 1	00 s MY MESSAGE	234 0) 255	0 0	0	59904	3	202	254	0	255	255	255	255	255
Description: CI/ID Request		Descri	intion: CI/ID Rea	unet											
Single Shot after 0.	0 s CI/ID Request	234		uest 0	0	59904	3	235	254	0	255	255	255	255	255

13.11 Entering the Message Data

You may enter the **Transmit Message** data by clicking on the specific window and typing in the data from the CAN database as illustrated below.

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31939	55552	DM14	8	6	Memory Access Request																	
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31939	57088	DM13		12	Stop Start Broadcast																	
31939	57344	CM1	0	17	Cab Message 1																	
31939	57600	GPM21	8	0	Reserved for 15O 11992																	
31939	57856	OPM11	8	0	Reserved for ISO 11992																	
J1939	58112	DM07	8	3	Command Non-continuously Monitored																	
31939	58368	RGE11	- 8	0	Reserved for ISO 11992																	
31939	58624	RGE21	. 8	0	Reserved for ISO 11992																	
J1939	58880	VT12	65535	0	Virtual Terminal-to-Node																	
31939	59136	VT21	65535	0	Node-to-Virtual Terminal																	
31939	59392	ADM	8	9	Acknowledgment Message																	
31939	59904	RQST	3	1	Request																	
31939	60160	TP.DT	8	2	Transport Protocol - Data Transfer																	
	60416	TP.CM.xx	8	36	Transport Protocol - Connection Mgmt																	





14 CCP TESTER FUNCTION BLOCK (ADVANCED USERS)

You can configure the **CCP Tester** block by left-clicking on the block and selecting **[Configure CCP]** from the drop down menu as illustrated below. Alternately, you may double click the block to pull up the configuration window.

	CCI	Configure CCP			
		Disable Block Rename Block			
		Block Help Properties			
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Diagnostics (J1939)/We Connect/Disconnect Master/Source Add Slave/Destination Addr Slave/Destination Addr uint32 KeyAlgorithm(uint32 Keya = key = seed ^ return key;	ress 249 0 ht32 seed) { seed; //va 0x12345678 //return v	CCP Version:	Add Function Block * 3 Supported Resources: CAL DAQ PGM Locked Resources: CAL DAQ PGM CAL DAQ PGM CAL DAQ CAL		
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Diagnostics (J1939)/We Connect/Disconnect Master/Source Add Slave/Destination Addr CAL Unlock uint32 Key/algorithm(uint32 K	ress 249 0 ht32 seed) { seed; //va 0x12345678 //return v	CCP Version: CCP Version: Connect lue from GET_SEI ; //just a simpl alue is sent to Unlock CAL	Add Function Block *		
Diagnostics (J1939) Connect/Disconnect Master/Source Addi Slave/Destination Addr CAL Unlock uint32 Key # key # seed ^ return key; Image: State in the second seco	ress 249 0 ht32 seed) { seed; //va 0x12345678 //return v	CCP Version: CCP Version: Connect Connect Lue from GET_SEI ; //just a simplatue is sent to Unlock CAL Address: Data	Add Function Block *		
Diagnostics (11939) Connect/Disconnect Master/Source Add Slave/Destination Addr CAL Unlock uint32 Key = key = seed ^ return key; Download/Upload Data Address: Data: Download	arkspace Chart) ress 249 0 0 nt32 seed) { seed; //va 0x12345678 //return v	100% CCP Version:	Add Function Block Supported Resources: CAL DAQ PGM Locked Resources: CAL DAQ PGM CAL DAQ PGM CD command is pass te key algorithm unlock CAL resour Len: Len: Len: Len: Len:		
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EControls°



15 CUSTOM SCRIPT FUNCTION BLOCK (ADVANCED USERS)

To edit a **Custom Script**, right-click the mouse on the **Custom Script** function block and select **[Show Code Window]** from the drop down menu by left-clicking on the selection as illustrated below.



The following window will open showing examples of the various **Custom Script** function block functions. The scripting uses a C / C++ style syntax. The script editor also includes an "auto complete" and "intellitip" feature which will help to show the available variables and functions as well as the parameters and syntax required. Simply type the variable name followed by a '.' to show all variable options.



15.1 Displaying the Custom Script Output Window

To display the **Custom Script Output Block** window right-click with the mouse on the **Custom Script** function block and select **[Show Output Window]** from the drop down menu by left-clicking on the selection as illustrated below.





15.2 Displaying Custom Script Function Block Help

A

To display the help feature for the **Custom Script** function block right-click on the **Custom Script** function block and select **[Block Help]** from the drop down menu by left-clicking the mouse on the selection as illustrated below.

Diagnostics (21939)

NOTE: This **Block Help** feature is available for all function blocks.



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The following window will open:







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16 USER PANEL FUNCTION BLOCK

You may open the **Custom Panel** by right-clicking on the **Custom Panel** function block and selecting **[Show User Panel]** by left-clicking the mouse on the selection. Alternately, simply double click on the **Custom Panel** function block.



16.1 Invoking the Designer Mode

You may invoke the **Designer Mode** to create your own custom gauge by right-clicking the mouse on the **Custom Panel Screen** and selecting **[Designer Mode]** from the drop down menu by left-clicking the mouse on the selection as illustrated below:



NOTE: The capture must be stopped in order to enable this option.





16.2 Adding a New Custom Gauge

After selecting the **Designer Mode** you can create a new gauge by right-clicking on the **Custom Panel Screen** and selecting **[New Control]** from the drop down menu as illustrated below. The 5 options for **Control Types** are:

- Edit Box
- Label
- Circular Gauge
- Numeric Indicator
- Linear Gauge

Each option will be described in the following sections.



16.3 Adding an Edit Box or Label Control

After choosing to add an **Edit Box** or **Label Control** from the **[New Control]** menu, you will be prompted with a special mouse cursor signifying which control is about to be created. While this cursor is showing, simply drag and release a square area in the **Custom Panel** workspace to create an **Edit Box or Label** with the respective size. The newly created **Label** will say **"Text"** – various properties of the label, including the actual text, can be changed by following the instructions in the **Overview of the Gauge Container** section below.

- Examples of **Edit Boxes** are the two controls that show "**214**" in the above image.
- Examples of Label Controls are the "Engine Speed", "Battery Voltage", and "Coolant Temp" displays in the above image.





16.4 Adding a Circular Gauge, Numeric Indicator, or Linear Gauge

After choosing to add a **Circular Gauge, Numeric Indicator,** or **Linear Gauge** from the **[New Control]** popup menu, you will be presented with a screen similar to the image below. From this window, you may choose the type of control by selecting one of the options from the **Gauge Type** dropdown menu. For each type of control, you can select from a variety of appearance themes by selecting an option from the **Gauge Theme** dropdown menu.

NOTE – ADVANCED USERS: You can create your own custom themes by adding or editing the XML files in the **AppearanceThemes** folder. The default location of this directory is:



C:\Program Files\EControls\CANCapture\Gauge Templates\AppearanceThemes

When you have found your desired gauge, double-click on it, and you will be prompted with a special mouse cursor signifying that a gauge control is about to be created. While this cursor is showing, simply drag and release a square area in the **Custom Panel** workspace to create a **Gauge Control** with the respective size.

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16.5 Overview of the Gauge Container

The gauge controls are completely customizable with an infinite number of configurations. Each set of **Circular Gauges**, **Numeric Indicators**, **Linear Gauges**, and **Labels** are contained within a **Gauge Container**, and each **Gauge Container** can contain any number and combinations of these gauge elements.

Each Circular Gauge can have various Circular Scales, Circular Pointers, and Circular Ranges:

- **Circular Scales** The round portion of the gauge containing the tick marks and the numeric labels. For example, the blue bar ranging from 0 to 100 in the gauge at the bottom-right of the image below.
- **Circular Pointers** The pointer of each gauge that is used to indicate the value the gauge is showing. This can be a pointer style (as highlighted in orange below), a marker style, or a bar style.
- **Circular Ranges** This is the visual range such as the "red-line" that is commonly shown on tachometers. An example of this is the green-to-red gradient in the gauge on the bottom-right of the below image.

Each Linear Gauge can have any number of Linear Scales, Linear Pointers, and Linear Ranges, which are identical to those of the Circular Gauge, but for the respective Linear Gauge.

In addition, the **Linear Pointers** also have a "**Thermometer**" style which can be used to indicate the gauge value in a fashion similar to that of a thermometer, as seen in the **Coolant Temp** gauge below.



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16.6 Edit Properties of a Gauge Element

Method 1: To list and edit the properties of any Gauge Element within the Gauge Container, right-click on the Gauge Container and follow the sub-menus beneath the Circular Gauges, Linear Gauges, Numeric Indicators, and Gauge Labels menus. As you highlight each menu option, the respective gauge element will be outlined and highlighted in orange, as seen in the image on the previous page. To edit a gauge element, select the [Show Properties] option for the respective gauge element; this will cause the item's properties to be displayed in the Properties window as seen in the image below.

Method 2: You can also show the properties of a **Gauge Element** by left-clicking on the item while in **Designer Mode**. When the element is selected, it will be highlighted in orange and the element's properties and settings will be visible in the **Properties** window. An example of this can be seen in the below image.



NOTE: It is recommended that you have the **Properties** window visible in a separate window or docking pane while editing the gauge elements.





There are many properties and settings for each gauge element, ranging from location, size, and width to color, gradients, styles, and fonts. Rather than describing each property in this manual, a brief description for each property can be displayed by highlighting the property and reading the **Integrated Help Panel** located at the bottom of the **Properties** window. An example of this integrated help can be seen in the description of the **DistanceFromScale** property in the image below.



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16.7 Add Gauge Element to Existing Gauge Container

You can add a **Gauge Element** (i.e. Linear Gauge, Circular Scale, Numeric Indicator, Label, etc.) to an existing **Gauge Container** by right-clicking on the **Gauge Container** and following either the **Circular Gauges, Linear Gauges, Numeric Indicator,** or **Gauge Labels** sub-menus and clicking on the respective **[Add (Element Name)]** option as illustrated below.



Circular Scales, **Circular Pointers**, and **Circular Ranges** can only be added to existing **Circular Gauges**, and similarly, **Linear Scales**, **Linear Pointers**, and **Linear Ranges** can only be added to existing **Linear Gauges**. An example showing how to add a **Circular Range** to the 'Default' Circular Gauge can be seen in the image below.







16.8 Delete Gauge Element from a Gauge Container

<u>Method 1:</u> You can delete a **Gauge Element** (i.e. Circular Gauge, Linear Pointer, Circular Range, Label, etc.) from an existing **Gauge Container** by left-clicking on the element so that it is selected and highlighted in orange. When the **Gauge Element** is selected you can delete it by now pressing the **Delete Key** on your keyboard. In the example image below, the circular scale that is selected in orange would be deleted after pressing the **Delete Key**.



<u>Method 2:</u> If a Gauge Element is not visible or off the screen (and therefore you cannot click on it to select it), you can also delete it by right-clicking on the Gauge Container and following either the Circular Gauges, Linear Gauges, Numeric Indicator, or Gauge Labels sub-menus and clicking on the respective [Delete (Element Name)]. As your mouse moves over the menu items for each Gauge Element, the item will automatically be highlighted so that you can see which item is going to be deleted. The image below shows an example of how to delete a Numeric Indicator; notice that the numeric indicator that will be deleted is highlighted in orange.





16.9 Apply Gauge Appearance Theme

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An appearance theme can be applied to any **Gauge Container** by right-clicking on the control and selecting **[Apply Appearance Theme].** After selecting this option, a **File Select Dialog** will be displayed asking for the Appearance Theme XML file to apply to the **Gauge Container**.

A set of pre-defined Appearance Themes can be found in

C:\Program Files\EControls\CANCapture\Gauge Templates\AppearanceThemes



After selecting the **Appearance Theme** file, all the properties defined within the theme will be applied and the **Gauge** will display the new appearance. An example of the **LCD Appearance Theme** applied to the above gauge is shown in the image below.



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16.10 Repositioning the Custom Gauge Container

You may reposition the gauge by holding the left mouse button down on the crosshairs icon to move the position in the vertical and horizontal axis as illustrated below.



16.11 Linking a CAN Variable to a Gauge Element

Gauge Elements and **Edit Boxes** can be linked to CAN variables that are defined within the current **CAN Database.** As each CAN variable is received by the **User Panel**, all controls that are linked to the respective variable will be updated in real-time.

To link a variable to a **Gauge Element**, first right-click on the desired **Gauge Container** and select **[Variable Link Properties]** from the drop down menu as illustrated below.

Alternately you can click on the small **Variable Link Properties Icon** in the top left corner of the **Gauge Container** next to the **Move Icon**.







The Variable Linking options will now be displayed in the Properties window as illustrated below. If not already enabled, set the Enable Variable Linking option to True, and you should then see options for each Circular Pointer, Linear Pointer, Numeric Indicator, Label, or Edit Box that is in the Gauge Container.



16.12 Linking and Setting the Source Variable

You may select the **Source Variable** that you want the respective **Gauge Element** to be linked to by clicking the mouse on the [...] Icon on the far right-hand side of the **Source Variable ID** line. You should then receive the **Choose Variable to Display Dialog** as seen in the image below.

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16.13 Saving a Custom Gauge Design

You may save a **Custom Gauge** by right-clicking the mouse on the gauge you want to save and selecting **[Export Gauges]** from the drop down menu by left-clicking the selection as illustrated below.

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After selecting the destination where you want to save your **Custom Gauge**, you can give your gauge file a unique name and save the gauge by left-clicking on **[Save]** as illustrated below. The gauge will be saved in the *.cui format. To discard your changes and return to the previous window select **[Cancel]** by left-clicking the mouse on the selection.

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16.14 Importing Saved Gauges

You may import or retrieve saved gauges to you **Custom Panel** by right-clicking on the **Custom Panel** workspace and selecting **[Import Gauges]** by left-clicking the mouse on the selection.



The following window will open:

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1	2000	110		110	Engine	Oil Level:	102.0	1%
	10				Engine	Oil Pressure:	1016	kP
	20				Engine	Coolant Level:	102.0	%
6	60	10		10	Engine	Coolant Pressure:	510	kP
Open					2	mand % Torque:	130	%
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Look in:	J Custom Ga	suges	- e			Torque:	1.875	%
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rader Me Computer						System In Make: VO Model: N S/N: 386	fo LVO /A 9307	
Network	File name:				Open			
	Files of type:	Grunn Impart (* cui)			Cancel			





You may now browse your computer storage for the gauge that you would like to import. When located, you may select the file by double clicking on the file name and then import it by left-clicking the mouse on the **[Open]** as illustrated below.

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B	les of type:	Gauge Import (".cul)		Cancel	E .			
		Open as read-only						

If you want to abort the **Custom Gauge** importing function and return to the previous menu, left-click on the **[Cancel]** button.