User Documentation

DiaLog

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1– Introduction

1.1-Overview

DiaLog is a complete data logging environment, which when combined with a Rebel data logger becomes a very flexible and powerful solution. DiaLog combines full data logger configuration capabilities, a graphics and data analysis package* and a number of administration facilities, with user-friendly graphical interfaces and an intuitive layout. DiaLog provides an easy to use environment capable of configuring data loggers to record any combination of data, retrieve the recorded data by multiple direct and remote methods and finally analyse the recovered data or prepare it for import into external tools.

- Construct complex data logger configurations for the most challenging applications using a simple graphical interface allowing intuitive construction from individual components and no need for scripting.
- Simple and efficient database system allows easy configuration administration, supporting import and export features and simple component transferal between configurations.
- Create complex Triggers with up to 30 conditions and 30 events with logic and formulaic application.
- Write customisable user messages for transmission to a vehicle.
- Conversion tables and formulae for instant scaling or feedback in engineering units.
- Configurable output signals.
- Supports multiple methods for data logger configuration, both directly and remotely.
- Provides USB, WiFi and GPRS connectivity.*
- Simple recorded data retrieval by direct or remote connection to the data logger.
- Live connection to the Rebel while data logging, allows personal control and live data feed.
- Powerful Data Analysis suite boasting data scaling, multiple data plotting, XY scatter plots and dual cursors and calculated channels among many other features.
- Supports all common data formats for simple data import and transfer to alternative software packages.
- 'Listen only' mode logging, allowing the recording the raw CAN data for up to 50 signals.
- Perform and store complete EOBD/OBDII reports on trigger commands.
- Convert and export multiple data files to a selection of formats and create one-shot event reports for multiple triggers.
- J1939 signal monitoring and DBC import.



1.2—Licence Agreement

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1.3—System Requirements

Minimum computer system requirements for effective running of DiaLog:

Windows XP, Windows Vista, Windows 7, 8, 8.1 or 10 512MB System RAM 800MHz or equivalent Processor

Influx Technology recommended minimum requirements:

Windows XP, Windows Vista, Windows 7, 8, 8.1 or 10 1GB System RAM 1GHz or equivalent



1.4—Software Versions

DiaLog is available in a number of software versions supporting different levels of functionality. The features supported and their relevant sections in this document are summarised below.

Feature	Section	Configurator	Plus
Import A2L Files			\checkmark
Import DBC Files		\checkmark	\checkmark
Import ODX Files			\checkmark
Import ROB Files			\checkmark
Export ROB Files			\checkmark
Export DBC Files			\checkmark
Export ODX Files			\checkmark
Live Data			\checkmark
Oscilloscope			\checkmark
One-Shot (Event) Lists			\checkmark
StreamLog Application Support			\checkmark
Triggers			\checkmark
Output Signals			\checkmark
Conversion Tables			\checkmark
Custom Message Constructor			\checkmark
Printout Reports			\checkmark
StreamLog Data Stream Channels			\checkmark
Export To MDF File Format			\checkmark
Export To CSV File Format		\checkmark	\checkmark
Export To Matlab File Formats			\checkmark
Export GPS Data			\checkmark
Export One-Shot (Event) Data			\checkmark
Export Raw CAN Data		\checkmark	\checkmark
Data File (IVD) Merging		\checkmark	\checkmark
Batch Conversion and Merging			\checkmark
Batch Report			\checkmark
DTC Data Analysis Tab			\checkmark
EOBD Data Analysis Tab			\checkmark
Broadcast CAN Data Tab		\checkmark	\checkmark
HS CAN Bus		\checkmark	\checkmark
MS CAN Bus			\checkmark
INST CAN Bus			\checkmark
Instrumentation Bus			\checkmark
Digital Bus		\checkmark	\checkmark
GPS Bus		\checkmark	\checkmark
CCP/xCP Protocol Support			\checkmark
CAN Monitoring Support		\checkmark	\checkmark
Diagnostics		\checkmark	\checkmark
DBC Editor			\checkmark
Periodic Identifier Database Editor		\checkmark	\checkmark



2—Getting Started

2.1—Software Installation

To begin installation of the DiaLog software open the installer by running the set up file.

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- A summary of the installation information, stating the default installation location and the user details.
- Click 'Next' to commence the installation.

- Complete the 'User Name' and 'Organisation' fields appropriately.
- Select the preference for computer user installation, to determine which computer users will have access to the DiaLog software.
- Click 'Next' to continue with the installation.

- Please review the 'Readme' information.
- Once ready, click 'Next' to continue with the installation



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DiaLog -	InstallShield Wiza	InstallShield Wizard The InstallShield Wizard h Finish to exit the wizard.	Next >	Cano	rel >

< Back Einish Cancel

- Installation has commenced and may take some time to complete.
- Do not restart your computer during the installation process.
- To stop the installation at this point click 'Cancel'. (This may result in a fragmented version of the software on the system.)

- Once the installation is complete this window will appear.
- Click 'Finish' to close the window, DiaLog is now successfully installed on your system.

With installation completed, if this is the first install on the computer, the user will be required to complete the licensing procedure.



2.2—Software Introduction

2.2.1—Graphical Overview

DiaLog is accessed using either the desktop icon:



or the 'Start Menu' directory—'All Programs\Influx Technology'.

Once started the user is presented with the following opening screen:

11 080_CAL Example V/N **** 12 080_CAL Example V/N **** 12 080_CAL Example Calication ID **** 12 080_CAL Example Calication ID **** 12 080_CAL Example Calication ID **** 13 CAL_Trace Calication ID **** 14 CAL Market D Calication ID **** 15 CAL_Trace Calication ID **** 16 CAL Calication ID **** 17 CAL_Trace Calication ID **** 16 CAL Calication ID **** 17 CAL_Trace Calication ID Calication ID 17 CAL_Trace Standard - Al CAN Messages Calication ID 17 CAL_Trace Standard - Al CAN Messages Calication ID 18 CAL_Trace O Number of CAldresses O 18 CAL_Trace O **** Calication ID 18 CAL_Trace O **** Calication ID 19 Calication ID O **** 10 Calication ID O <	ocal Projects	Vehicle	OBD CAN Example	^
Pit 1990_CAN Example Calibration ID **** 0 11 1933_Example Calibration ID **** 0 11 1933_Example Software ID **** 0 Loger Type Standard - Fast Sampling Rates Only Logger Mode Standard - Fast Sampling Rates Only Logger Mode Standard - Fast Sampling Rates Only Number of Diagnostic Addresses 0 Number of Diagnostic Addresses 0 Number of CD Addresses 0 Number of CD Idigital Channels 0 Number of Instrumentation Channels 0 Number of Trigger Items 0 Number of Trigger Items 0 Number of Oligital Channels 0	b ili OBD_CAN_Example	VIN	\$3.5A	
b 3 offware ID **** b 11 0302_Example Soffware ID **** Date 10/03/0 Date 10/03/0 Logger Type Standard - Fast Sampling Rates Only Sandard - Fast Sampling Rates Only Logger Mode Standard - Fast Sampling Rates Only Sandard - Fast Sampling Rates Only Number of PDS 59 Software ID Number of CP Addresses 0 Software ID Number of Tinger Items 0 Software ID Number of Tinger Groups 0 Software ID Number o	P II UBD_CAN_Example_Ext P II OPDU Europele	Calibration ID	****	
User	b % J1939_Example	Software ID	****	
Date 10/03/30 Logger Type Standard - Fast Sampling Rates Only Logger Mode Standard - All CAN Messages Number of PIDs 9 Number of Olagnostic Addresses 0 Number of CAN Signals 0 Number of Digital Channels 0 Number of Digital Channels 0 Number of Trigger Temes 0 Number of Trigger Settings 0 Temes With Conversion Tables 0 Number of Output Signals 0 Number of Output Signals 0 Number of Trigger Bernel PC Explorer 0	A 10 CAN_Trace	User	****	
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		Trame With Output Signal Properties Stream Channels PC Explorer	n	Ŷ



2.2.2—Database Panel

The 'Database' panel is located on the left-hand side of the application and is used to control the main functionality of the software. The main features are grouped into three (four including StreamLog) sections, navigated by the tabs found at the Top of the Application. The main tabs can be seen below.



Local Projects

The 'Projects' tab is used to create and administer the configurations for every data logging application.

Logger Structure

The 'Logger' tab becomes active when a data logger is connected to the computer. It then displays the current configuration of the data logger and provides a number of Rebel data logger settings and features.

Recording Analysis

The 'Analysis' tab contains the data handling and analysis features incorporated within DiaLog.

The operation of the main features of each of the 'Database Panel' tabs and the complete process of performing data logging is explored in the Quick Start Guide



2.2.3—Navigation Bar

The 'Navigation Bar' is situated at the top of the software screen and can be used to navigate to the majority of the program features, the features presented depend menu option selected and configuration e.g. Logger Online.

2.2.3.1—Navigation Bar – Configuration Menu

🛷 Wizard 🖳 New Project 🎼 New Configuration 🎹 New Bus 다 New Module 🔗 New Protocol 📃 New Data List 弾 New PID - 🍫 Properties 🖺 Copy 🛍 Paste 🗙 Delete

- Wizard—Allows for rapid wizard assisted configuration of the Data Logger
- New Project—Allows new Projects to be created to contain configuration
- New Bus—Allows the user to create a new 'Bus' item
- New Module—Allows the user to create a new 'Module' item
- New Protocol—Allows the user to create a new 'Protocol' item
- New Data List—Allows a new 'Data List' DAQ List or Polled List to be created.
- New PID—Allows the user to manually create a new Periodic Identifier
- Properties—Allows the user to edit the properties of the selected item
- Copy—Allows the user to Copy the selected item(s)
- Paste—Allows the user to paste the copied item(s)
- Delete—Allows the user to Delete the selected item(s)

2.2.3.2—Navigation Bar – Advanced Configuration Menu

🗾 New/Edit Triggers 🎩 New/Edit Output Signal 🗮 New/Edit Conversion Table 뺶 Message Constructor 🛛 昌 Configuration Report

- New/Edit Triggers—Allows Triggers to be added to a configuration to enable the Logger to be reactive to events
- New/Edit Output Signal—Allows Messages to be created to output to Control Units, Instrumentation, Displays or other tools
- New/Edit Conversion Table—Allows look up tables to be created to allow non-linear sensors to be calibrated to show true input values
- Configuration Report—Allows a user to generate a report that Details some or all of the following information:
- Vehicle Information, Triggers, Bus and Protocol Information, PIDs, Diagnostic Addresses, CCP Addresses, Event Lists, CAN Signals, Instrumentation Channels and Digital Channels

2.2.3.3—Navigation Bar – Project Menu

🖳 New Project 🚽 Edit Project 🖳 Delete Project 🔲 Import Project 🎦 Export Selected Project

- New Project—Allows new Projects to be created to contain configuration
- Edit Project—Allows a Projects name to be changed
- Edit Project—Allows a Project to be deleted
- Import Project—Allows a Project to be imported into the database
- Export Selected Project—Allows a Project to be exported to a *.dpv file

NOTE: Projects May also be hidden using the X on the projects tab on the very left of Dialog, this will not Delete the Project, it will simply hide it can be unhidden using the ^(O) button



2.2.3.4-Navigation Bar - Import Menu

🔣 Import Configuration 🎝 Recorded Data 🖳 Import Project 🛛 🚾 Load A2L 腿 Load DBC 🚾 Load ODX 脑 Load ROB 📫 Load Fibex

- Import Configuration—Allows a configuration to be imported into the selected Project
- Allows Recorded Data—Allows Data to be opened for Analysis or Export
- Import Project—Allows a Project to be imported into the database
- Load A2L—Allows the user to import an .A2L file into DiaLog and automatically opens the 'ASAP Item Selection' panel
- Load DBC—Allows the user to import a .DBC file into DiaLog and automatically opens the 'DBC Item Selection' panel
- Load ODX—Allows the user to import an .ODX file into DiaLog and automatically opens the 'ODX Item Selection' panel
- Load ROB—Allows the user to import a .ROB file into DiaLog and automatically opens the 'ROB Item Selection' panel
- Load FIBEX—Allows the user to import a FIBEX file into DiaLog and automatically opens the 'FIBEX Item Selection' panel

2.2.3.5—Navigation Bar – Export Menu

🚻 Configuration 🚺 Recorded Data 描 Description 📜 Export Selected Project 🛅 Export All Projects 📲 Export To CFF Filter File 猫 Export To LAB Filter File

- Export Configuration—Allows a configuration to be exported
- Export Recorded Data—Allows Data to be saved as an *.ivd file
- Export Description—Allows Data Item Descriptions to be exported in *.rob file format.
- Export CFF—Export to *.cff file format.
- Export LAB—Export to *.lab file format.

2.2.3.6-Navigation Bar - Presets Menu

📝 Edit PID Presets 📝 Edit J1939 Presets 📑 Table/ Formula Library 👼 Show DBC Editor

- Edit PID Presets—Allows On-board diagnostics Parameter IDs and Diagnostic Trouble Codes presets to be edited.
- Edit J1939 Presets—Allows the J1939 Diagnostic Trouble Codes presets to be edited
- Table/Formula Library—Formula Library—Opens the 'Conversion Methods Library'
- Show DBC Editor—Opens the in-built DBC file editor

2.2.3.7—Navigation Bar – Logger Menu



- Refresh Device Structure—Loads the active configuration resident in the Logger
- Send Configuration to the Logger—Sends the selected configuration to the Logger and activates it.
- Start—Starts the Logger if logging has been stopped
- Stop—Stops the Logger if it is recording
- Set Time—Set the real time clock in the Logger
- Settings—Find information about the Hardware, Set WiFi and GPRS settings
- Reflash—Update Logger firmware and get diagnostics information







- Add To Chart—Add Data Item to the Oscilloscope
- Show Scope—Show the Oscilloscope
- Backup IVD File—Allows backup of IVD files
- Batch Processing—Allows the user to export multiple data files to a number of alternative formats
- Merge IVD Files—Allows the user to select multiple .IVD files to be merged into a single 'Data File'
- Oscilloscope settings—Opens the 'Oscilloscope settings' window

2.2.3.9—Navigation Bar – StreamLog Menu

StreamLog StreamLog Settings

- StreamLog—Show the Remote Database Server
- StreamLog Settings—Set the Address and Password for the StreamLog Server

2.2.3.10—Navigation Bar – Settings Menu

📫 Options 🕢 Oscilloscope Settings 🌉 Logger Communication 🍇 StreamLog Settings

- Options—Set the General Options for DiaLog
- Oscilloscope settings—Opens the 'Oscilloscope settings' window
- Logger Communication—Set the Interface you wish to communicate with the Logger on
- StreamLog Settings—Set the Address and Password for the StreamLog Server

2.2.4—Import Tabs

Located on the far right of the software window, the 'Import' tabs allow the user to import items from a variety of description files. For full details on 'Data Items' see the relevant sections.

PP	1. ASAP Import
DBC	2. DBC Import
ODX	3. ODX Import
ROB	4. ROB Import
FIBEX	5. Flexray FIBEX Import



2.2.5—Main Panel

The 'Main' panel of the software window is multi-functional and has a number of display modes:

'Properties' - Displays the properties/summary for the selected item in the 'Database' panel.

'Data Items' - Lists all the 'Data Items' present on a particular 'Protocol'

'Stream Data' - Lists the 'Data Items' selected for constant transmission to the server. (StreamLog functionality for customers only, see StreamLog manual.)

'Live Data' - Oscilloscope function for data currently being logged by the Logger.

The default setting for this panel displays the properties of the selected item in the 'Database' panel and can be seen below.

Vehicle	OBDII_Example	^
VIN	***	
Calibration ID	****	
Software ID	****	
User	8888	
Date	17/06/14	
Logger Type	Standard - Fast Sampling Rates Only	
Logger Mode	Standard - All CAN Messages	
Number of PIDs	59	
Number of Diagnostic Addresses	0	
Number of CCP Addresses	0	
Number of CAN Signals	0	
Number of Instrumentation Channels	0	
Number of Digital Channels	0	
Trigger Settings		
Number of Trigger Items	0	
Number of Trigger Groups	0	
Conversion Tables		
Number of Conversion Tables	0	
Items With Conversion Tables	0	
Output Signals		
Number of Output Signals	0	
Items With Output Signal Properties Stream Channels PC Explorer	0	~

2.2.6—Message Panel

2.2.6.1—Status Message panel

The 'Status Message' panel displays the date, time and origin of all messages relating to the status of the software and any hardware connected and online.

Status messages

+ Logger Online Modules: 2/5 DataItems: 60/540

Analysis File: C:\...\Configuration1_RBLC100_20151110_142157.IVD

The panel also contains a 'right click' menu as shown below.

View—Provides a list of selectable data columns to display as well as a 'show last message' selection function. Clear message—Removes the highlighted message from the list. Clear all messages—Removes all messages from the panel. Save all messages—Provides the option to save the messages in a variety of formats: .log, .doc, .xls, .html and .csv.

2.2.6.2—Status Bar



The 'Status Bar' is used to display a number of key pieces of information that remain visible during all the software operations.

+ Logger Online Modules: 2/5 DataItems: 60/540

Analysis File: C:\...\Configuration1_RBLC100_20151110_142157.IVD

From left to right.

Rebel Status—Indicates the connection status of the Rebel by any of the connection methods.

Modules—Indicates to the user the number of 'Modules' created for the current 'Configuration Structure', with a maximum of five.

Data Items—Indicates the number of 'Data Items' implemented in the current 'Configuration Structure', with a maximum of 540 or 800(ARM processor based Rebel Loggers).

Analysis File—Displays the .IVD data file currently imported into the 'Recording Analysis' panel.



3—Quick Start Guide

3.1—Introduction

DiaLog is designed to allow the easy and quick facilitation of the set up and running of Rebel data loggers and the collection and analysis of the recorded data.

DiaLog and the Rebel data logger are designed with a multitude of users in mind and as such the steps to begin logging with the Rebel are purposefully very simple and quick, with many more features and abilities available to the user upon further investigation.

The Quick Start Guide demonstrates the complete procedure for utilising the Rebel data logger. Starting with the connection and configuration of the Rebel data logger. The guide then shows the user how to perform a very common and useful task—data logging a variety of Powertrain data. The method for collecting and analysing the recorded data is then considered.

The processes involved in performing these tasks are common to the general application of the software and provide the user with a functional introduction to using DiaLog and the Rebel.

3.2—Rebel Drivers

Once DiaLog has been successfully installed, the Rebel drivers must be correctly installed to ensure the Rebel functions correctly.

DiaLog installation automatically contains a driver installation application, which can be found in the Influx Technology folder of the Start Menu as shown below.

	Influx Technology	~
	Dialog 5.0.0.0	
iii.	Influx Licensing	
1	K-Box Cal	
-	ModuleAnalyser 2.14.3.0	
1	Rebel Dash Config	
6	Rebel Drivers	
1	SDCard Configuration	
3 7	StreamLog Assistant	
		×
←Ва	ack	
	[_])	



Ensure the Rebel is not plugged in and click 'Next' to continue.

<image>Influx Technology

 Image: Stream of the Stream of



The driver installation will begin and may take a few moments. Once the installation is complete, click 'Finish' to close the application.

Influx Technology



Plug in the Rebel to allow the drivers to be recognised.



3.3—How to Connect to a Rebel Data Logger

The main function of DiaLog is the administration of the Rebel data logger. To begin using the Rebel data logger it must first be configured for the required data logging application. The first step is to establish a connection between the Rebel data logger and DiaLog.

The Rebel boasts a variety of connections and communication abilities, but the main interface between a Rebel and DiaLog is via a USB connection. The USB port may be located behind the protective flap on the end of data logger, as can be seen below. Note: Press firmly on the centre of hinge to release flap.

There are two states in which the Rebel can communicate via USB:

Limited Mode—In this state the Rebel is powered only by the USB connection. This allows quick and simple communication with the logger when a power source is not available. In this mode the user can retrieve data via USB and send new 'Configuration Structures' to the logger. The logger may have limited capability until fully powered up. Full Powered—To achieve this state correctly the logger must powered via the Vehicle connection and also connected to a transmitting CAN bus to ensure it is fully awake. (Full details of setting sleep settings can be found in this document) In this mode all functionality is available. When a 'Configuration Structure' is sent to the logger, in this state the Rebel will immediately reconfigure. This state is also required for updating the logger firmware.

Once the required logger state has been chosen the Rebel can be connected to the computer.

- 1. Using the USB cable supplied, connect the Rebel to your computer's USB port.
- 2. DiaLog will automatically recognise the Rebel.
- 3. Once DiaLog has recognised the Rebel it will confirm the connection.



3.4—Local Projects

3.4.1—Introduction

The 'Local Projects' is the 'Database' tab of the 'Database' panel and is where all the configuration for data logging tasks is performed and stored. It is a powerful tool allowing the user to create an infinite variety of complex configurations to facilitate any data logging application.



3.4.2—Configuration Structure

The data logging process is based around creating configuration files which instruct the Rebel data logger to perform the required tasks. These constructs are known as a 'Configuration Structure' and are saved with their own dedicated file format. The structures are entirely user configurable and provide a very simple explicit procedure for configuring very complex tasks. A 'Configuration Structure' is built by the user in the 'Local Projects' panel where it is represented graphically as can be seen in the example below:



A structure is composed of a number of different components. These are: 'Configuration', 'Bus', 'Module', 'Protocol' and the 'Data Items' - more detail on each can be found in their relevant sections. Once a 'Configuration Structure' has been completed it is stored by the software as an .IVS file. The .IVS file is then imported in to the Rebel data logger which is used to configure it for the required task.

3.4.3—Recording On-Board Diagnostic Powertrain Data

DiaLog automatically loads with two pre-created 'Configuration Structures' stored in the 'Local Projects' in the 'Demo' tab. The purpose of these structures is to provide a simple tutorial to enable the user to very quickly configure the Rebel data logger to perform two common tasks.



The pre-loaded 'OBD_CAN_Example' 'Configuration Structure' can be seen below.



The Rebel will attempt to log the data for all of the PIDs. However, each module is different and may only support a subset of the data items. Any unsupported items will simply not be logged, without effecting the successful data logging of the remaining items. The 'Data Items' tab can be seen below with the pre-loaded PIDs.

🖾 No.	Rate	Stream	Label	Units	PID	Address	Size	Datatype	^
Ģ [©] 1	1 Sec	No	02S11	V	0x14	0x00	2	Unsigned Byte	
Ģ □ 2	1 Sec	No	02\$12	V	0x15	0x00	2	Unsigned Byte	
Ģ ™ 3	1 Sec	No	02\$13	V	0x16	0x00	2	Unsigned Byte	
Ģ ™ 4	1 Sec	No	02\$22	V	0x19	0x00	2	Unsigned Byte	
Ģ [™] 5	1 Sec	No	SHRTFT1	%	0x06	0x00	1	Unsigned Byte	
Ģ ™ 6	1 Sec	No	SHRTFT11	%	0x14	0x00	2	Unsigned Byte	
₽ [®] 7	1 Sec	No	SHRTFT12	%	0x15	0x00	2	Unsigned Byte	
Ģ ™ 8	1 Sec	No	SHRTFT13	%	0x16	0x00	2	Unsigned Byte	
Ģ [∞] 9	1 Sec	No	SHRTFT22	%	0x19	0x00	2	Unsigned Byte	
🐺 n 10	1 Sec	No	PTO_STAT	-	0x1E	0x00	1	Unsigned Byte	
Ģ [©] 11	2 Sec	No	CATEMP12	degC	0x3E	0x00	2	Unsigned Word	
🐺 🕫 12	2 Sec	No	IAT	deg	0x0F	0x00	1	Unsigned Byte	
👰 🕫 13	2 Sec	No	ECT	degC	0x05	0x00	1	Unsigned Byte	
👰 🕫 14	2 Sec	No	AAT	degC	0x46	0x00	1	Unsigned Byte	
👰 🕫 15	2 Sec	No	CATEMP11	degC	0x3C	0x00	2	Unsigned Word	
📮 🕫 16	5 Sec	No	EGR_ERR	%	0x2D	0x00	1	Unsigned Byte	
👰 🕫 17	5 Sec	No	CATEMP21	°C	0x3D	0x00	2	Unsigned Word	
🐺 🕫 18	5 Sec	No	EVAP_VP	Pa	0x32	0x00	2	Signed Word	
🐺 🕫 19	5 Sec	No	CATEMP22	°C	0x3F	0x00	2	Unsigned Word	
0 ^{ID} 20	10 Sec	No	AIR STAT: OFF		0x12	0x00	1	Bitfield	Y
< Properties	Items							>	
riopenies	Rems	I O ENPIOIOI							

The 'Configuration Structure' is configured to a generic 'OBDII' setting designed to work on the majority of OBD compliant vehicles. However, the structure can be manually configured for the specific module to be data logged to ensure success. In this case the module manufacturer should be identified and the appropriate settings chosen. To do this the 'Protocol' must be edited and this can be seen below.



To edit the 'Protocol' in this case called 'OBD', highlight the 'Protocol' and either use the 'right click' menu shown below.

8+	New Protoco	
4	N <u>e</u> w Data List	t
₽¦₽	Ne <u>w</u> PID	
	Import Items	•
*•	<u>P</u> roperties	
P	<u>С</u> ору	
ĥ	Paste	
×	<u>D</u> elete	Del
2	Save To Pres	ets
	E <u>x</u> port	•

The 'Properties' menu opens 'Edit Diagnostic Protocol' window as shown below.

ts 🙀 Import Fror	n ODX	Diagnostic Mor	1. / 5		
		Diagnostic Mor	1. / A		
		Diagnostic Mot	ie / Access		
		DTCMode:	Group:	Status M	lask:
OBD		0x0	0xFF	0x0	1000
Module	Type:	Method:			
Siemer	ns 💌	Report Numbe	er of DTC by Stati	us Mask	
	Module Viemer	ModuleType:	DTCMode: 0x0 ModuleType: Method: Siemens Report Number	DTCMode: Group: 0x0 0xFF ModuleType: Method: Siemens Report Number of DTC by Statu	DTCMode: Group: Status M Dx0 DxFF Ox0 ModuleType: Method: Siemens Siemens

The window contains a number of different settings, however, here we are concerned with the 'Module Type' and 'Protocol' settings. These allow the selection of the module manufacturer and the required 'CAN Protocol' from drop-down menus. Once the required settings have been chosen click 'OK' to confirm the changes and close the window.

The 'Configuration Structure' is now ready for use.



3.4.4—Recording J1939 Broadcast Data

The second 'Configuration Structure' which comes pre-loaded in the 'Demo' tab with DiaLog is designed to collect a sample set of the J1939 broadcast CAN data available on any J1939 bus.



The structure utilises the 'CAN Monitor' protocol to listen to and capture specific signals from the bus.

The structure is loaded with a sample set of signals, designed to demonstrate the ability to record J1939 data. Each J1939 bus is unique may not support every signal. A large array of further signals are also available from the bus and these can be added using a suitable DBC file

28	No.	Stream	Label	Units	Rx Ident	Message Name	Start Bit	Bit Co
\sim	1	No	CognetTextor	L	1,000	1.01	0	32
\sim	2	No	Cognet's shaft said here?	L	14/08Pt= 003	NEWE C	32	32
\sim	3	No	VolterintTrannel	km/hr	Add Pto BTTS	Henner	48	16
\sim	4	No	Teameral III an easily in the last	km/h	Technology and	461111	0	8
\sim	5	No	To a Prograph / Alta Information	km/h	10.7538.753	12.28	48	16
\sim	6	No	Tallograph Data History	rpm	INCOME.	11.21	32	16
\sim	7	No	Theoreticalitation		10.7531.751	12.21	30	2
\sim	8	No	VoldballineTh one apprech		140 210 210 210	19.29	14	2
\sim	9	No	Vitationiation		140703120	12.22	6	2
\sim	10	No	EnglamondPlacounflorage	%	10071014010	(m)))	56	8
\sim	11	No	Calibumationale		INCOMENTS.	(00)	48	4
\sim	12	No	Trainable of the set o		10071034610	(IIII)	40	8
\sim	13	No	Engliseed	rpm	10.7103471	(IIII) (F	24	16
\sim	14	No	included and included include	%	10071034610	(IIII)	16	8
\sim	15	No	Disseries and a second second	%	10071014010	(000) () ·	8	8
\sim	16	No	AND STREET AND	%	10.71114611	(IIII)	4	4
\sim	17	No	Eng/TengaalHiside		10071034610	(00)	0	4
\sim	18	No	Collinerating/Flocom/Flocom/Flocom	%	1007101000	em (2)	56	8
\sim	19	No	/indition/codialities/PercentFlorgue	%	1407101000	em()	48	8
~	20	No	TO THE PARTY AND		14071010101	em()	46	2
<								>

The J1939 signal items loaded in the structure can be seen in the 'Items' panel as shown below.

The 'Configuration Structure' is now ready for use.



3.5—Rebel Configuration

3.5.1—Introduction

Once the required 'Configuration Structure' has been completed, it is ready to be utilised in the Rebel data logger for the required task. In the case of the pre-loaded 'OBD_CAN_Example' the structure is configured to collect a number of PIDs using Mode 0x01, this example is considered here. However, the process is identical for all 'Configuration Structures'.



There are two ways to configure the Rebel data logger, the first is by direct connection to the Rebel and the second involves uploading directly to an SD card.

Warning:

All new SD cards must be formatted in the Rebel prior to use. This is performed from the Logger Tab by clicking on Rebel Explorer and Clicking the Format SD Card Icon

	DiaLOG 5.0.0.0 [OBD_CAN_Example]		- - ×
Projects Logger Analysis Stream	Log Import Export Project Configuration Ad	vanced Config Presets Loc	gger Analysis StreamLog Settings Help
Refresh Device Structure	nd Configuration to the Logger 🐻 Start 🐻 Stop	🛞 Set Time 📕 Setting	is 📴 Reflash
Local Projects	Active Configuration	ėlė= =	1971
OBD_CAN_Example	✓ "_" OBD_CAN_Example		×
🔜 🍃 🔐 CAN 0 (HS)	A 👭 CAN 0 (HS)	SD Eoldoro	Size Date created
EngineController	🗾 📲 EngineController	S0 Influx Tech	Jize Date created
🔋 👘 😢 OBD	A 🗔 🕼 OBD	Million and a second second second	
GPS and Accelerometer Bus	- 🖸 👰 02S11		
Module1	- 🖸 👰 02S12		
GPSProtocol	- 🗖 👰 02S13		
IDED_CAN_Example_Ext	🖂 💭 👰 02\$22		
Image: Book of the second s	🔲 👰 SHRTFT1		
Il 1939_Example	🗌 🖗 SHRTFT11		
CAN_Trace	- 💭 👰 SHRTFT12		
	- 💭 👰 SHRTFT13		
	- 🔲 🖗 SHRTFT22		
	PTO_STAT		
	CATEMP12		
	ECT		
	AAT		
		For the best result we r	ecommend using defragmented sd cards!
		17/02/16 03:43:31	Free Space: 13676 MB (90%)
		 Properties Live Data Re 	bel Explorer
Status messages	la de la companya de		
•€•Lagger Opline Modules: 2	2/10 DataItems: 60/800		Analysis File: CA \Configuration1_BBLC100_202
v cogger online modules. 2			



3.5.2—Uploading a Configuration Structure to a Rebel Data Logger

The first step is to ensure the Rebel is connected and ready to be configured. The next step is to 'Send the Configuration to the logger'.

Ensuring the required 'Configuration Structure' is selected in the 'Local Projects' panel, there are two ways of uploading the 'Configuration Structure'. The first is the 'Send Configuration to the Logger' toolbar icon.

Send Configuration to the Logger

The second is through the 'right click' menu for the 'Configuration' in the 'Local Projects' panel, as shown below.

114	New Configuration	
mţ	N <u>e</u> w Bus	
5	<u>T</u> riggers	٠
E,	Ne <u>w</u> /Edit Conversion Table	
S	New/E <u>di</u> t Output Signal	
CRU	Message Constructor	
*	Properties	
h	<u>С</u> ору	
ĥ	Paste	
×	De <u>l</u> ete	Del
194	Send Configuration to the Logger	
	Send Configuration to SD Card	•
	1. C. 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1	
	Server	83
	Import Configuration	8.

Here the 'Send vehicle file to the Logger' menu item is required. Once DiaLog has been instructed to send the required 'Configuration Structure' to the data logger the 'Confirmation' window will appear, as shown below.



This window is a precautionary measure to ensure the logger is not accidentally reconfigured, as doing so stops the current 'Configuration Structure' from being the active structure on the Rebel data logger.



To continue the upload of the 'Configuration Structure' to the Rebel data logger, click 'Yes'. This will begin the process and the 'Progress' window will appear as shown below.

	Please Wait	×
1 	Tasks Uploading Configuration Set Configuration As Active	
	0%) 🗶 (

Once DiaLog has completed the upload to the Rebel the 'Progress' window will automatically close. If you wish to 'Stop' the sending of the 'Configuration Structure' during the upload process the 'red cross' can be used, in this instance the Rebel will be left with no active 'Configuration Structure'.

When a new 'Configuration Structure' is uploaded to a Rebel data logger it is automatically set as the active structure. This means that any 'Configuration Structure' present on the Rebel will remain deactivated and not be used for data logging.

With the structure loaded to the Rebel, the 'Active Configuration' panel will automatically update to display the current active 'Configuration Structure' as can be seen below.



The Rebel now contains a valid 'Configuration Structure' and is ready to begin data logging the required task.

Upon connecting the Rebel to a vehicle it will automatically reconfigure itself using the new 'Configuration Structure' and begin data logging.

Note:

Configuration Structure priorities between the Rebel and SD card—An active structure on an SD card will always take priority over the Rebel. However, if a blank SD card is inserted into a Rebel with a structure on-board this will automatically be loaded to the SD card.



3.5.3—Uploading a Configuration Structure to a SD Card

The second method involves directly uploading the 'Configuration Structure' to an SD card. Insert the SD card to be used in the Rebel into the PC's SD card reader. The upload is performed using the 'SD Card' window accessed either using the 'right click' functionality on the Configuration in the Projects Tab as shown below or by using the Set Configuration to SD button on the PC Explorer Tab.

114	New Configuration				
Шļ	N <u>e</u> w Bus				
5	<u>T</u> riggers	3			
E.	New/Edit Conversion Table				
5	New/Edit Output Signal				
9	Message Constructor				
•	Properties				
	<u>С</u> ору				
ĥ	Paste				
×	Delete	Del			
Ŷ.,	Send Configuration to the Logger		-		62
	Send Configuration to SD Card	3	F	SD	<u>E:\</u>
G	Server	3			
R	Import Configuration				
	Export	3	Ě		

This ability to independently load the required 'Configuration Structure' to the SD card allows Rebel data loggers to be remotely configured using pre-prepared SD cards. When an SD card containing a 'Configuration Structure' is inserted in to a Rebel it will automatically reconfigure itself using the 'Configuration Structure' on the SD card. If there is more than one structure present the Rebel device will configure itself using the 'Configuration Structure' currently set to active.

Influx Technology recommends the use of SanDisk SD cards to ensure reliable performance. The SD cards recommended for use with the Rebel are:

SanDisk Ultra 2GB-64GB

Alternative cards should work, but are not tested.

Note:

Configuration Structure priorities between the Rebel and SD card—An active structure on an SD card will always take priority over the Rebel. However, if a blank SD card is inserted into a Rebel with a structure on-board this will automatically be loaded to the SD card.



3.6—Rebel Data Logging

3.6.1—Connecting a Rebel Data Logger to a Vehicle/Module

Once the 'Configuration Structure' has been created and uploaded the Rebel is ready to be used for data logging. The first step is to connect the Rebel to the vehicle or module to be data logged.

The Rebel contains a number of different connection options; the current 'Configuration Structure' determining which are required for each application. The Rebel logging connections are considered below.

Main Vehicle Connection—Usually D-type connector contains a number of vehicle connections including: CAN 0 (HS), CAN 1 (MS), LIN and K-Line.

Analogue and Digital Channels and or connection for H Box external instrumentation (If installed)

With the correct connection established between the Rebel and the vehicle/module, the vehicle/module can be powered up for data logging to begin.

Upon powering up, the Rebel will automatically wake on the CAN Bus activity (Dependent on the Sleep Mode Setting). Each time a new 'Configuration Structure' is uploaded or set as the active structure (or an SD Card containing a new 'Configuration Structure' inserted), on the first Rebel power up it will automatically use the new 'Configuration Structure' to reconfigure itself.

The reason for this process is to fully configure and prepare the Rebel for the data logging task, e.g. creating any required DAQ lists. This process may vary in length with the complexity of the 'Configuration Structure'. However, it is a one time process for a new structure and ensures on each subsequent power up, the Rebel is prepared to immediately begin data logging.

3.6.2—Data Logging

Once the Rebel data logger has completed reconfiguring itself it is ready to begin. With the correct vehicle/module connection established the Rebel will begin to data log immediately.

The front panel also contains a number of LEDs intended to inform the user of the logger status. The LEDs are user programmable but unless specified operate in the default mode:

F1. CAN 1 (MS) Bus traffic.
F2. Data Logger is configured and ready.
F3. Instrumentation/Trigger status.
F4. GPS status—flashes when acquiring data.
F5. CAN 0 (HS) Bus traffic.
Status. On—waiting, Flashing—ready
Connect. On—connected, Flashing—activity
SD Card. On— connected, Flashing—activity



3.7—Data Retrieval and Analysis

The Rebel is capable of collecting a large amount of data from an array of sources, utilising a number of methods simultaneously. Once the required data has been logged to the Rebel, for this example a number of Mode 0x01 PIDs, it needs to be retrieved from the Rebel data logger in order to be analysed.

3.7.1—Retrieving Recorded Data from a Rebel Data Logger

The procedure for retrieving the data from the Rebel is very simple and there are a number of options for achieving this. The first and most common method, utilises DiaLog to download the required data directly from the Rebel. Simply navigate to the Logger Tab, select the Rebel Explorer, with the Rebel connected and 'Online' with Dialog, the 'Rebel' window opens as shown below.

The Rebel Explore displays all the files currently stored on the Rebel in associated 'Configuration Structure' folders. To retrieve the data logged using this structure, click the 'expansion' icon to display the files related to the required structure.

Here the tree lists two file types, the first is an .IVS file which is the 'Configuration Structure'. The second is an .IVD file, which is a data file, containing all the recorded data from a single logging session. A session being each time the Rebel power cycles, normally with the power on and off of the vehicle/module.

The data files are named in the format: configuration name_rebel name_YYYYMMDD_HHMMSS.IVD to ensure each data file is unique.

To retrieve the data file(s) from the logger, 'right click' on the selected data file(s) to display the menu shown below.



Clicking 'Get File(s)' will begin the download of data file(s) on to the user's computer. As can be seen there is an approximated download time for the file(s).

Upon clicking 'Get File(s)' the software requests the user to select the desired location to save the data file.

The 'Progress' window will then appear displaying the download completion for the data file(s). Once DiaLog has completed the download of the data file from the Rebel the 'Progress' window will automatically close. If you wish to 'Stop' the download of the data file during the process the 'red cross' can be used. In this instance a partial data file will be stored, however the file will remain unaffected on the Rebel device.



With the completion of the download the Dialog software will display a prompt asking if the user requires the data file to be automatically imported into DiaLog, as can be seen below.

DiaLog		×
? Do you want to import the	e downloaded file(s <u>Y</u> es	s) in Dialog? <u>N</u> o

- Yes—Imports the data file into the 'Recording Analysis' tab of the 'Database' panel.
- No— The file has been saved to the computer; however it will not be imported into the software at this time.

The second method for retrieving the logged data, is to manually obtain them directly from the SD card. The Rebel writes directly into FAT32 format on the SD card which allows direct access to the cards through your operating system. The retrieval then becomes as simple as locating the required .IVD file on the SD card and saving it to your system. The file can then be imported into the DiaLog software for data analysis and subsequently exported in a number of file types for external analysis.



3.7.2—Data Analysis

Once data files have been retrieved from the Rebel they can be imported into DiaLog to be analysed. This can either be done automatically on retrieving the data file, or manually by the user. Data files are manually imported into DiaLog using the Import Recorded Data Functionality.



Select the required .IVD data file in the 'Open' window and click 'OK' to import in to the 'Recording Analysis' panel as shown below.

As can be seen the recorded data is displayed in the same format as the 'Configuration Structure' utilised in its capture. In this instance the recorded data is in the form of a number of PIDs captured using Mode 0x01.





3.8—Rebel Trouble Shooting

3.8.1—Rebel Not Logging

This trouble shooting guide runs through the diagnosis of possible problems if the Rebel is not logging when expected. The Rebel can be determined to be not logging by the absence of 'Logging' on the LCD and no flickering of the SD LED indicating no writing to the SD card.




3.8.2—Incorrect Data Records

This trouble shooting guide runs through the diagnosis of possible reasons for data records missing from IVDs or not logging when expected.





3.9—Frequently Asked Questions

This section covers a number of common tasks and questions for using DiaLog and the Rebel data logger.

3.9.1—How to interpret the Rebel Status LEDs

- F1. CAN 1 (MS) / INST bus traffic Flash-searching, Steady-connected. If a connection is not established, please check the bus is correctly configured for baud rate, protocol and data items.
- F2. On Valid configuration. If not lit try power cycling the Rebel and check there is an active structure on the SD card.
- F3. Instrumentation board active. Indicates the Instrumentation bus has been configured on the structure.
- F4. GPS status flashes slowly when acquiring data. If not flashing please check the bus is configured on the structure and antenna is correctly connected.
- F5. CAN 0 (HS) bus traffic Flash-searching, Steady-connected. If a connection is not established, please check the bus is correctly configured for baud rate, protocol and data items.
- Status. On-waiting, Flash-ready.
- Connect. On-connected, Flash-communicating.
- SD Card. On-connected, Flash-writing to card.

3.9.2—How to open the flap and access the SD card and USB Connection on IP65 Loggers

Press firmly down on the top of the hinge of the flap.

While maintaining a suitable pressure to release the catch, swing the bottom of the flap forwards. Please note: While a firm pressure is required to open the flap, excessive force will cause damage to the hinge.

3.9.3 — How to configure the data logger

The Rebel data logger can be configured using either the USB connection or a prepared SD card. Configuration via USB:

- 1. Open DiaLog and connect the Rebel to your computer via USB port.
- 2. Highlight the required Configuration Structure in the Local Projects by clicking on the name.



3. Use the right-click menu 'Send Configuration to the logger' option to send to the Rebel. This writes the configuration structure to the SD card as the 'active structure'.

4. If the Rebel is fully powered, or if only powered by USB when next fully powered, the Rebel will reconfigure itself to the new structure.

Configuration via SD card:

1. Open DiaLog and insert the SD card into the computer's reader.



2. Highlight the required configuration structure in the Local Projects by clicking on the name.



3. Use the right-click menu 'Send Configuration to SD Card' option to send to the SD Card. This writes the configuration structure to the SD card as the 'active structure'.

3.9.4—How to set the logger sleep modes

×
·
min)
Cancel

Each Configuration Structure allows the user to determine the sleep settings for the logger.

- Select the configuration structure.
- Click 'Properties'.
- Select the 'Sleep Mode' tab.

Sleep mode settings:

Sleep mode - determines the method in which the logger will wake.

- Wake on HS bus activity
- Wake on MS bus activity
- Wake on Inst bus activity
- Wake on HS or MS bus activity
- Wake on Alarm 1

• Power down mode - this enters the logger into a deep sleep using <3mA.

Sleep Delay - specifies the delay before the logger sleeps.

Additional Option

Limit Module Wakeup

• Init Timeout - Enters the logger into a silent mode (no polling) after the specified time.

• Delay after polling - Forces the logger to 'remain silent' even if traffic is present on the bus. This allows the vehicle to sleep.

Influx TECHNOLOGY

4—Local Projects

4.1—Introduction

The 'Local Projects' panel is fundamental to the configuration of the Rebel. It allows the user to build a completely custom 'Configuration Structure' to enable the Rebel to perform innumerable complex tasks.

4.2—Project

The 'Local Projects' panel found on the left of the screen is the 'Projects' tab of the 'Database' panel and can be seen below.



This section will explore the functionality of the 'Local Projects' panel, the main features being the creation and administration of configurations for any data logging application. The 'Configuration Structure' created contains the required configuration information and is constructed from a number of components, each of which allows an array of options.

The different stages of construction of a 'Configuration Structure' are explored in a clear, stepwise fashion. Highlighting the available options at each stage, making it simple for the user to produce a configuration for the most complex of data logging tasks.

New Project—Allows the creation of a new 'Project', which will be represented by a new tab in the 'Local Projects'. A 'Project' can also be created using the 'New Project' icon. DiaLog will prompt you to select a 'Project' name, as seen below.

	New Project	×
Project Name Project 2	Σ.	
	<u>0</u> K	<u>C</u> ancel

- Edit Project—Re-opens the 'Project Name' window to allow the editing of the 'Project' name.
- Delete Project—Allows the deletion of the entire selected 'Project' tab, which is the open tab in the 'Local Projects' panel.
- Import Project—Enables the import of a .DPV 'Project' file into the DiaLog software. The file includes all 'Configuration Structures' within the 'Project'.
- Export Project—Enables the export of the current selected 'Project' as a .DPV file for external storage purposes or transfer between software copies



4.3—Configuration Structure

Once a 'Project' has been created, the 'Local Projects' is ready to begin creating a 'Configuration Structure'. A 'Configuration Structure' is the structure which contains all the configuration settings to instruct and set up the Rebel for the desired application. A 'Configuration Structure' is a configuration file and is stored as an .IVS file.

A 'Configuration Structure' is created from a number of specific components. They are purposefully designed to be analogous to the physical set up, allowing the intuitive creation of structures capable of configuring the Rebel for even the most complex applications.

A simple example structure can be seen below, each of the individual components are considered in order below.



Configuration

The 'Configuration' is the base building block for the 'Configuration Structure' and represents the vehicle to be data logged. As such it contains both a number of general details for the vehicle and configuration settings for the Rebel data logger.

Communication Bus

The 'Bus' directly designates the physical connection to the module to be used by the Rebel during data logging. Multiple 'Buses' may be included in one configuration and each contain a number of settings pertaining to the physical equivalent.

Module

The 'Module' represents an individual module/ECU within a vehicle, with up to 5 modules permitted per 'Configuration Structure' across all 'Buses'.

Protocol

The 'Protocol' determines the communication method to be utilised by the logger to interact with the module. As such the 'Protocol' contains a number of settings pertaining to the communication for the module to be logged.

	No.	Rate	of Stream	Label
P ^{ID}	1	10 Sec	No	EQ_RAT
₽¤	2	100 mSec	No	EGR_PCT
₽®	3	100 mSec	No	LOAD_ABS
₽ ®	4	100 mSec	No	TAC_PCT
₽®	5	60 Sec	No	MIL_TIME
₽	6	60 Sec	No	FUELSYS2
₽®	7	60 Sec	No	FUELSYS1
₽	8	60 Sec	No	CLR_TIME
₽	9	30 Sec	No	VPWR
₽®	10	30 Sec	No	MIL_DIST
₽®	11	30 Sec	No	EGR Monitor (DPFE)
₽ [®]	12	30 Sec	No	CLR_DIST
₽ [®]	13	10 Sec	No	WARM_UPS
₽®	14	1 Sec	No	02511
<				
Pro	operti	es Items	PC Explo	rer

Data Items

The 'Data Items' denote the individual items to be recorded and can include a large array of possibilities depending on the above configuration settings

4.4-Vehicle

The first step in creating a 'Configuration Structure' is to create a 'Configuration'. A 'Configuration' allows you to specify a number of settings for not only the configuration to be data logged, but also the Rebel data logger for this task. It is effectively the base building block of a 'Configuration Structure' and allows the designation of a number of general settings.

To create a new 'Configuration' either the 'New Configuration' toolbar icon or right click in the Project Tree and Select New Configuration



Upon creating a new 'Configuration' the 'Configuration Settings' window will appear as shown below. The window opens on the 'Properties' tab as default.

e.	New Configu	ration	×
irties	Configuration settings Configuration Name:		
Prope	VIN:	Calibration ID:	
ode	User:	Software ID:	
Sleep Mo	Date (dd/mm/yy): 17/02/16		1 Limits
	Stream Rate DAQ1	Stream Rate D	AQ2
Settings	U.5 sec Stream Rate DAQ3 2 sec	1 sec	•
	Slow Rate (msec) 0	Fast Rate (mse 0	ec)
	Description		
	<u>D</u> efault	<u>0</u> K	<u>C</u> ancel

Configuration settings:

• Configuration Name—Allows the naming of the 'Configuration' item.

• VIN—Allows the user to specify a Vehicle Identification Number.

- Calibration ID—Allows the user to specify the calibration of the vehicle.
- User—Designates the current user/creator of the 'Configuration Structure'.
- Software ID— Allows the user to specify the module software.

• Date—Allows the user to specify a date for the 'Configuration Structure', DiaLog automatically enters the days date, but it is editable to user requirements.

• Apply ARM Limits—Allows the user to extend the logging capabilities to fully utilise the ARM processors capabilities.

• Stream Rate—Allows the user to select the stream rate for each 'Stream Data' DAQ list. (StreamLog functionality.)

Logger settings:

• Logger Type—Drop down menu selects from a number of logger sampling options.

• Logger Mode—Drop down menu selects from a number of logger operational modes.

The window also contains a default button which allows all settings to be automatically returned to their original states.



Sleep Mode Tab

÷.	New Configuration	×
Properties	Sleep Mode Settings Sleep Mode Wake up on CAN HS Activity	
Sleep Mode		
Settings	✓ Limit Module Wakeup Init Timeout (min) Delay after polling (min) 2 2	
	Default <u>O</u> K <u>C</u> ance	1

Sleep Mode Settings:

Sleep Mode—Drop down menu selects the sleep mode setting.

Sleep Delay— Designates the wait time until entering sleep mode.

Limit Module Wakeup—For modules that wake on a tester message, recommend the following settings. Init Timeout (min) - Time Rebel continues polling. Delay after polling (min) - Time after cease polling before power down. Allows the Rebel to enter a silent mode before sleep enabling modules to sleep.

The window also contains a default button which allows all settings to be automatically returned to their original states.



Settings Tab



Keep Alive Setting:

You should not need to alter these settings unless instructed to do so by Influx Technology Engineers

Aux Power On:

Controls the Digital 3/+Vd pin of the Logger to supply power to the Rebel Dash or K-Box when the Logger is powered via the Vehicle Connector (CAN & PWR)

The window also contains a default button which allows all settings to be automatically returned to their original states.

Clicking 'OK' closes the window and creates the new 'Configuration' item.

Once a new 'Configuration' has been created it will appear in the 'Local Projects' panel, in the current 'Project' tab.





With a 'Configuration' selected, the 'Properties' tab of the 'Main' panel displays a summary of the 'Configuration Structure' built on this 'Vehicle' item as can be seen below.

Vehicle	Configuration
VIN	****
Calibration ID	****
Software ID	****
User	****
Date	17/02/16
Logger Type	Standard - Fast Sampling Rates Only
Logger Mode	Standard - All CAN Messages
Number of PIDs	0
Number of Diagnostic Addresses	0
Number of CCP Addresses	0
Number of CAN Signals	0
Number of Instrumentation Channels	0
Number of Digital Channels	0
Trigger Settings	
Number of Trigger Items	0
Properties Stream Channels PC Explorer	0

The 'Configuration' can also be created using a 'right click' menu as shown below

144	<u>N</u> ew Configuration	
Ш	N <u>e</u> w Bus	
5	<u>T</u> riggers	۲
E.	Ne <u>w</u> /Edit Conversion Table	
5	New/E <u>di</u> t Output Signal	
CPU.	Message Constructor	
*	Properties	
	<u>С</u> ору	
	Paste	
×	De <u>l</u> ete	Del
10	Send Configuration to the Logger	
	Send Configuration to SD Card	•
	Server	۲
II)	Import Configuration	
	Export	٠

• New Configuration—Allows the creation of a new 'Configuration'.

- New Bus—Creates a new 'Bus' item
- Triggers—Provides the ability to create and edit 'Triggers'
- New/Edit Conversion Table—Provides the ability to create and edit 'Conversion Tables'
- New/Edit Output Signal—Provides the ability to create and edit 'Output Signals'
- Properties—Re-opens the 'Vehicle Settings' window for the current selected 'Vehicle' to allow editing of the 'Vehicle' settings.
- Copy—Copies selected item.
- Paste—Places copied item in to the 'Local Projects' panel.

• Delete—Removes selected item from the 'Local Projects' panel.

• Send Configuration to the Logger— Uploads 'Configuration Structure' to the Logger

• Send Configuration to SD Card— Uploads 'Configuration Structure' to the SD Card

• Import Configuration—Allows the user to import an .IVS, 'Configuration Structure' file.

• Export—Allows the export of the current 'Configuration Structure' as either a .IVS file or a .ROB file, for transfer between installations.

Influx TECHNOLOGY

4.5—Bus

4.5.1—Creating a Bus

The second step in building a 'Configuration Structure' is to select the required 'Bus'. A 'Bus' is the physical connection between the logger and the vehicle and determines how the Rebel will communicate with the configuration being logged.

There are a number of different 'Bus' types available and it is possible to have up to one of each type of 'Bus' per 'Configuration Structure'.

Creating a Bus

To create a new 'Bus', select the required 'Vehicle' and use the 'New Bus' toolbar icon or the right click menu.

£	Choose Bus	×
Hardwar	e Types	
CAN CAN	D (HS)	
CAN CAN	1 (MS)	
CAN CAN :	2 (INST)	
CAN CAN	3	
CAN CAN	4	
Kline KLINE	Ē	
LIN LIN		
INST H-Box	< Port	
GPS GPS	and Accelerometer	
DIG Digita	I/Analogue	
FLX FlexR	ay	
LAN LAN		
	<u>0</u> K <u>C</u> a	ncel

Hardware Types

- CAN 0 (HS)—CAN bus 0.
- CAN 1 (MS)—CAN bus 1.
- CAN 2 (INST)—CAN bus 2.
- CAN 3—CAN bus 3.
- CAN 4—CAN bus 4.
- KLINE—ISO 9141-2 and ISO 14230-4 Kline bus
- LIN—Local Interconnect Network bus
- H-Box Port—Connection to the internal Instrumentation board, instructs the logger to record from the board.
- GPS and Accelerometer—GPS and Accelerometer connection and instructs the logger to record GPS and Accelerometer data.
- Digital/Analogue—Designates the digital inputs.
- FlexRay—High Speed FlexRay Bus
- LAN—Ethernet Bus

Select the required 'Bus' type and click 'OK'.

Upon selecting a 'Bus' type a window with a number of options for the selected 'Bus' opens. The window and options are dependent on the bus selected and are considered individually below.

CAN Buses

÷	CAN Bus		×
CANBus Settings			
Bus Speed		Bus Mode	
500 kbs	-	Standard 💌	
BTR0:		BTR1:	
DIV:			
		Enable Settings	
	<u>0</u>	K <u>C</u> ancel	

CAN Bus Settings:

Bus Speed—Drop down menu selects the transmission rate for the 'Bus'.

Bus Mode—Drop down menu selects the operational mode for the 'Bus'.

Enable Settings: Currently disabled.



H-Box Port Instrumentation Bus

e	H-Box Port Settings						
Board Type 2x H-Box 30 Default Board -20V to 20V	Channels ▼ I Range ▼	Max Ra 30 TC Filte Slow	r				
		<u>0</u> K	<u>C</u> ancel				

GPS and Accelerometer Bus

£	New GPS Protocol	×
GPS Protocol Set	tings	
Protocol Name: GPS and Acceler Accelerometer	ometer Protocol	GPS rate
Rate Max 💌		Range +-4G 💌
	<u>0</u> K	Cancel

H-Box Port Settings:

• Board Type—Drop down menu selects the Influx instrumentation board type installed.

• Max Rate—Specifies the maximum transmission rate.

• Default Board Range—Sets the Hardware Voltage Range to be used.

• TC Filter—Enables/Disables filtering of thermocouple data and selects the speed of the filter

GPS and Accelerometer Settings:

- Protocol Name—Name of the Bus.
- GPS Rate—Rate at which GPS Data is Logged.
- Accelerometer Rate—Rate at which Acceleration is Logged, Max will Log at a very high rate and use a lot of space on the SD Card, if Acceleration Data is not needed it is recommended that this be limited.
- Accelerometer Range—Sets the Range of Acceleration that can be recorded



FlexRay Bus

•				FlexRay	Configu	ration Regi	sters					×
ELX Load F	From File											,
Cluster	Controller	Wake up										
Cycle Para	meters			Topology					Static Segme	ent		
Cycle		Bit		Cluster Dampir	ng	Macro F	^p er Cycle		Static Slots		Payload Le	ength
0.00	μs	0.00	μs	0	uT	0		MT	0	МТ	0	
Macrotick		Macro Per C	/cle	TSS Transmitt	er				Offset		Static Slot	
0.00	μs	0	MT	0	bit Ti	mes			0	МТ	0	мт
Dynamic S	Segment			Network Idle	Time				Errors			
Minislots		Minislot Offse	ŧ	NIT					Max Passive		Max Fatal	
0		0	MT	0	MT				0		0	
Minislot		Idle Phase		Offset Correcti	on				Max Init Error			
0	мт	0		0	MT				0.00	μs		
Start up / :	Sync			Other								
Cold Start N	Num	CAS Rx Low	Мах	Net Vector Le	ngth							
0		0		0	bytes	e.						
Sync Node	Max	Listen Noise		Symbol Windo	W.							
0		0		0.00	μs							
										<u>0</u>	K	Cancel

Normally the configuration is loaded from a FIBEX file but it can be manually configured as well.



Clicking 'OK' will close the window and creates the selected 'Bus' which appears in the 'Local Projects' panel.

As can be seen, this process also automatically creates a 'Module', with a 'Bus' created, this enables a 'right click' menu, when a 'Bus' is selected, as shown below.



New Module—Allows the creation of a new 'Module'

Load Protocol—Allows the creation of a 'Protocol'

Properties—Re-opens the 'CAN Bus Settings' window to allow editing of the settings. Copy—Copies the complete 'Bus', to allow 'Pasting' into alternative open 'Projects' in the software.

Paste—Places the 'Copy' of a 'Bus' into the selected 'Projected', however note only one 'Bus' of each type is allowed in a single 'Project'.

Delete—Removes the entire selected 'Bus' from the 'Configuration'.

The Projects are designed to allow the administration of a large number of different 'Configuration Structures'



4.6—Module

The third step in building a 'Configuration Structure' is to create a 'Module'. A 'Module' is analogous to the module/ECU within the vehicle to be logged.

Creating a Module

To create a new 'Module', select the required 'Bus' and use the 'New Module' toolbar icon, or the 'right click' menu as shown below

m	<u>N</u> ew Bus	
	N <u>e</u> w Module	
✓,	Load Module From Presets	
*	<u>Properties</u>	
F	<u>С</u> ору	
ľ	Paste	
×	<u>D</u> elete	Del
	Export	×

The 'Module Settings' window is shown below

÷	Ν	lew Module			×
Module Settings					-
Module Name:					
Module1					
GPS Sampling Speed					
Fast Sampling Rate		Multiplier	Slov	v Sampl	ing Rate
10 mSec	х	100	100	0	mSec
Digital Inputs Sampling	g Sp	eed			
Fast Sampling Rate		Multiplier	Slov	v Sampl	ing Rate
10 mSec	ж	100	100	10	mSec
			<u>0</u> K		<u>C</u> ancel

Module Settings:

• Module Name—Allows the user to designate the name for the module.

GPS/Digital Inputs Sampling Speed:

- Fast Sampling Rate—Designates the faster rate of sampling.
- Multiplier—Over sampling multiplier,
- calculates the slow sampling rate.
- Slow Sampling Rate—Specifies the calculated slow sampling rate.



Once a new 'Module' has been created it will appear in the 'Local Projects' panel.

There is a maximum of five 'Modules' permitted per 'Configuration Structure' and the current tally can be found in the 'Status Bar'.

Logger Offline Modules: 1/5 DataItems: 0/540



Creating a Module from Presets

A second method allows a 'Module' to be created by loading pre-configured settings. This is achieved by using the 'Bus' activated 'right click' menu as shown below.

щ	<u>N</u> ew Bus	
	N <u>e</u> w Module	
	Load Module From Presets	5
*	<u>P</u> roperties	
F)	<u>С</u> ору	
ř,	P <u>a</u> ste	
×	<u>D</u> elete	Del
	E <u>x</u> port	×

The 'Load Module from Presets' menu item opens a window, which allows the user to import a DiaLog Presets File (.DPF) to automatically configure a 'Module'.

With a 'Module' created, this enables a 'right click' menu, as shown below.



- New Module—enables the user to create a new 'Module' on the same 'Bus' as the current selected 'Module'.
- New Protocol—enables the user to create a new 'Protocol' on the selected 'Module'
- Properties—Re-opens the 'Module Settings' window, to allow the user to edit the settings for the selected 'Module'.

• Copy—Copies the 'Module', to allow pasting into alternative open 'Projects' in the software.

- Paste—Places the copy of a 'Module' into the selected 'Bus'.
- Delete-Removes the selected 'Module' from the 'Bus'.

4.7—Protocol

4.7.1—Introduction

The fourth stage of creating a 'Configuration Structure' is to create the 'Protocol'. A 'Protocol' is the definition of the method of communication between the Rebel and the vehicle. There are a number of different 'Protocols' available and it is possible to have multiple 'Protocols' running within one 'Configuration Structure'. However as a 'Protocol' defines the communication for each 'Module' only one protocol can be used per 'Module' and not all 'Protocols' can be used on every 'Bus'.

There are a number of different 'Protocol' options, which vary depending on the 'Bus' type selected. The different options are considered below. However, physical module specific restrictions may also apply.



Bus Types	Protocol Types									
	Diagnostic	ССР	CAN Monitor	Instrumentation	GPS	Digital				
CAN HS	✓	~	✓							
CAN INST	✓	\checkmark	✓							
CAN MS	~	V	√							
Instrumentation				V						
GPS					~					
Digital						✓				

Creating a Protocol

To create a new 'Protocol', select the required 'Module' and use the 'New Protocol' toolbar icon or the right click menu.



As discussed above there are a number of 'Protocol' options depending on the 'Bus' type. Here a 'Protocol' being created on a 'CAN' bus is shown, the process is analogous for all 'Bus' types. Each 'Protocol' type is considered in detail in the following sections.

Upon creating a 'Protocol' the 'Choose Protocol Type' window will appear as shown below.

Choos	Choose Protocol Type				
Available Protoc	ols				
Diagnostic					
CCP CCP Protocol		100			
CAN CAN Monitor					
	<u>0</u> K	<u>C</u> ancel			

- Available Protocols:
- Diagnostic
- CCP Protocol
- CAN Monitor
- Instrumentation
- GPS
- Digital

Each 'Protocol' can only be used once for each 'Module', if a 'Protocol' already exists for the selected 'Module', it will automatically not appear in the 'Choose Protocol Type' window shown previously.

Upon selecting a 'Protocol' type, the 'Settings' window will appear. For full details on each 'Protocol' type please refer to the relevant sections, where each is considered individually.





Once a 'Protocol' has been created, it appears in the 'Local Projects' panel.

Once a 'Protocol' has been created the settings can be edited using the 'Properties' window, an example is shown below.

	Edit Diagnostic Prot	ocol	Last Used A2L : I	Unknown		×
Import From Preset	s 📴 Import From	ODX				
Diagnostic Settings			Diagnostic Mod	le / Access		
Protocol Name:			DTCMode:	Group:	Status N	1ask:
Diagnostic1			0x0	0x0	0x8	142
Protocol	ModuleTy	pe:	Method:			
ISO 14229	▼ Siemens		Report DTC by	y Status Mask		-
Diagnostic Mode:						
Default Session		-				
2.						
General ISO Settin	gs Advanced	Rate	and Security			
<u>D</u> efault					<u>0</u> K	<u>C</u> ancel

The window is specific to each 'Protocol', however, for all 'Protocols' where description file imports are possible. If any 'Data Items' have been imported for the 'Protocol', the file utilised is denoted in the bar at the top of the window. With a 'Protocol' item created a 'right click' menu is enabled.

8+	<u>N</u> ew Protocol	
4	N <u>e</u> w Data List	
P +	Ne <u>w</u> PID	
	Import Items	•
*•	<u>P</u> roperties	
	<u>С</u> ору	
ĥ	Paste	
×	Delete	Del
	Save To Prese	ts
	Export	.

- New Protocol—Allows the user to create a new 'Protocol' on the same 'Module'.
- New PID—Allows the user to manually create a new PID 'Data Item'.
- New Data List—Allows the user to manually create a new 'Data List'.,
- Properties—Displays a summary of the 'Protocol' in the 'Properties' panel.
- Copy—Copies the selected 'Protocol'.
 - Paste—Places the copied item into the 'Configuration Structure'.
 - Delete—Removes the selected item from the 'Configuration Structure'.

• Save To Presets—Allows the user to save the 'Protocol' as a .DPV file, for loading into alternative 'Configuration Structures'.



4.7.2—Diagnostic Protocol

This section details the options for the 'Diagnostic Protocol', upon selecting a 'Diagnostic Protocol' the 'Diagnostic Protocol Presets' window will appear as shown below.

£	Diagnostic Protocol Presets		×	
Select Presets Bosch ISO14229	Protocol Name	Bosch ISO 14229	~	
Conti ISO14229 ISO14230	Protocol	ISO 14229		
IS015765	Module Type	Bosch		
Keyword2000 OBDII Siemens ISO14229	Diagnostic Mode	Extended Diagnostics Session		
	150 15764, 150 14229			
	Module Ident	0x7E8		
	Tester Ident	0×7E0		
	TX Ident Scan Mode	0x7DF		
	Flow Status (FS)	0x0		
	Separation Time (ST) Min	2		
	Separation Time Min Default	2 2 0x0		
	Separation Time Max Default			
	Block Size Max (BS Max)			
	Block Size Max Default	0x0		
	Keep Alive Tick	2000		
	Oversample Rate	5		
	Keyword 2000 / ISO 9141		~	
		<u>о</u> к	<u>C</u> ancel	

This window contains a number of pre-configured settings for three possible applications.

- Bosch_ISO14229—Contains settings designed to be used for diagnostic purposes on modules manufactured by Bosch using ISO14229.
- Conti_ISO14229—Contains settings designed to be used for diagnostic purposes on modules manufactured by Continental Automotive Systems using ISO14229.
- ISO14230—Contains settings designed to be used for diagnostic purposes on modules using ISO14230.
- ISO15765—Contains settings designed to be used for diagnostic purposes on modules using ISO15765.
- OBD_Generic—The settings configured in this option are aimed at the general user, allowing diagnostic data to be collected from any module supporting EOBD/OBDII.
- Siemens_ISO14229—Contains settings designed to be used for diagnostic purposes on module manufactured by Siemens using ISO14229.

These 'Presets' are designed to allow the user to quickly and simply, with minimal understanding required, create a 'Protocol' that is applicable to large numbers of vehicles and tasks.



The individual settings are considered in detail below. If none of the 'Presets' are required then click 'Cancel' to close the window and open the 'New Diagnostic Protocol' window, without any pre-configuring of the settings, as shown below.

	New Diag	nostic Protocol	Last Used A2L :	Unknown		×
Import From P	Presets 🙀 Imp	port From ODX				
Diagnostic Settings			Diagnostic Mod	le / Access		
Protocol Name:			DTCMode:	Group:	Status M	ask:
Diagnostic1		1	0x0	0x0	0x8	144
Protocol		ModuleType:	Method:			
ISO 14229	•	Siemens 💌	Report Numbe	er of DTC by Stati	us Mask	
Diagnostic Mode:						
Extended Diagnostic	os Session	•				
24		1				
General ISO S	Settings Ad	vanced Rat	e and Security			
<u>D</u> efault					<u>0</u> K	<u>C</u> ancel

The window opens on the 'General' tab by default. There is also an 'Import from Presets' button, which re-opens the 'Diagnostic Protocol Presets' window above. The window also contains a 'Default' button allowing restoration of original settings.

The 'Protocol' settings are considered below.

General Tab

New Diagnostic Protocol		. I	Last Used A2L :	Unknown		>		
🖳 Import	From Presets	lmpor	t From OD	х				
agnostic S	ettings			[Diagnostic Mod	le / Access		
Protocol Nar	ne:				DTCMode:	Group:	Status M	Aask:
Diagnostic1				0x0	0x0	0x8	145	
Protocol		Mo	duleType:		Method:			
ISO 14229		▼ Si	emens 🔤	•]	Report Numbe	er of DTC by State	us Mask	-
Diagnostic M	lode:							
Extended D	iagnostics Session			•				
	agreetes seeder							
General	ISO Settings	Advan	ced F	Rate and	Security			
Default							ОК	Cancel

- DTC Mode—Designates the Diagnostic Service to be utilised.
- Group
- Status Mask—Advanced DTC reading status mask.
- Method—Drop down menu selects the method for DTC report.

Diagnostic Settings:

• Protocol Name—Allows users to designate a name for the 'Protocol'.

- Protocol—Drop down menu selects the ISO standard to be utilised.
- Module Type—Drop down menu selects the module manufacturer.
- Diagnostic Mode—Drop down menu selects the diagnostic session type.
 - Diagnostic Mode/Access:



ISO Settings Tab



- ST Min Default—Specifies the separation time minimum. .
- ST Max Default—Specifies the separation time maximum.
- BS Max—Specifies the maximum message block size.
- BS Max Default—Specifies the default message block size. .
- Keep Alive Tick-
- . Check For Valid PID Range—Instructs the software to automatically insert a check valid PID range command.

.

Advanced Tab



- Dynamic Ident—Specifies the Dynamic Data Identifier. •
- Dyn Ident Range- Number of Idents available. .
- Periodic Idents List-Lists all created Periodic identifiers
- Add Ident—Allows the user to add a new Identifier, opens the window shown below. .
- Edit Ident—Allows the user to edit the settings for the selected Identifier.
- Delete Ident-Removes selected identifier.
- Enter Ident:
- Periodic Ident—Allows the user to manually specify the required Identifier.

ŧ.	Add	ID	×
DBC In	nport ID fro	om DBC File	
Enter	Ident		
Perio D	dic Ident (H	EX)	
	<u>0</u> K	<u>C</u> ancel	

ISO 15765, ISO 14229 Settings:

Module Ident—Designates the identifying label for all . module messages.

Tester Ident—Designates the identifying label for all • tester messages.

Tx ID Scan Mode-

FS—Designates the flow status for the flow control frames.

ST Min—Specifies the message transmission

separation time for consecutive frames.

- **Advanced Settings:**
- DTC settings.

CAN Settings—Drop down menu selects CAN message ٠ settings.

- Addr Size—Specifies the number bytes per address. •
- Address Block
- Data Size—Specifies the number bytes per data item. .
- Max Fast DAQ Msg-Specifies the maximum n
- UDS:

Import ID from DBC File—Allows the user to import the required Data Identifier from a .DBC file, once the required file is selected it opens the window shown to the right. Selecting a CAN item from the list automatically enters the identifier.

Once all the settings have been configured as required, clicking 'OK' will close the window and creates the 'Protocol' as specified.

DTC Settings - Drop down menu selects the required



4.7.3—CAN Calibration Protocol

This section details the options for the 'CCP/xCP Protocol', upon selecting a 'CCP Protocol' the 'CCP Protocol Presets' window will appear as shown below.

÷	CCP Protocol Presets		×	
Select Presets Bosch CCP 001	Protocol Name	Bosch_CCP_001	~	
Bosch_CCP_002 Bosch_CCP_003	CCP Settings			
Bosch_CCP_004	Protocol Version	CCP 2.1		
Conti_xCP	Command Receive Object (CRO)	0x310		
Delphi_CCP_001 ZF_TCU_001	Data Transmision Object (DTO)	0x320		
	Station Address	0xAD01		
	Byte Order	MSB Last		
	List Mode	Strict List Order		
	CRC Type	0x0		
	DAQ Name List	segment synchronous, 10ms time synchronous		
	Idents List	0x330,0x340,0x350		
	Mode List	0,1,2		
	Prescale List	Synch 1, 10mSec, 100mSec		
	Protocol Type	CCP		
	Prescale	True		
	DAQ Start	0x0,0xA,0x19		
	DAQ Size	10,15,15	~	
Import From A2L File		<u>D</u> K <u>C</u> an	cel 🛛	

This window contains a number of different pre-determined settings for three possible applications.

The settings are designed to be used for modules manufactured by various Manufacturers and should allow the user to immediately configure the 'Protocol' to work with all modules.

These 'Presets' are designed to allow the user to quickly and simply create a 'Protocol' that is universally applicable to large numbers of vehicles and tasks.

The window also contains an 'Import from A2L File' button, this allows the settings for the 'CCP Protocol' to be automatically determined using an appropriate A2L file and opens the 'New CCP Protocol' window as discussed below. (An A2L file is an 'ASAM MCD 2 MC-language' file which indexes the internal memory layout for a specific module.)



The individual settings are considered in detail below. If none of the 'Presets' are required then click 'Cancel' to close the window and open the 'New CCP Protocol' window as shown below.

P Settings			Available DAQ Lists		
Protocol Name:		Station Address:	Name	Ident	Mode
CCP1	1.000	0x0			
CRO:	DTO:	Protocol Version:		5	a contra de la
0x0	0x0	CCP 2.1 💌		Prescale	Sampling Mult
RC Type:	Byte Order:	Dynamic DAQ Lists:			
)x0	MSB First 💌	False 💌		Size	Start
aud Rate:	Short Upload:	Cal Page Address:			
1000 kbs 🔻	False 💌	080			
iet Status:	Cal Support:			Event ID	
False 💌	Ealse 💌			3	10
offware Name:					
bel Settings					
lax Timeout:	Seed Key:	One Byte DAQ Only:			
500 m	ns OxO	False 💌			
ist Mode:		Oversample Rate			
Strict List Order	•	10			
Z Default quant is	dontifier	🗖 Llee quent identifier			

CCP Settings:

- Protocol Name—Allows the user to specify the name for the 'Protocol'.
- Station Address—Specifies module.
- CRO—Command Receive Object.
- DTO—Data Transmit Object.
- Protocol Version—Drop down menu selects the standard to be utilised.
- CRC Type—Not used.
- Byte Order—Endian format.
- Prescale—Use Prescale setting.
- Use Event Identifier—Use Event ID setting.
- List Mode—Specifies list numbering method.
- Oversample Rate—Specifies the ratio of missed data points to recorded.
- Baud Rate—Transmission rate of module.
- Keep Alive:
- Use Keep Alive—Selects to use the Keep Alive function.

Available DAQ Lists:

- Name—Lists all existing DAQ lists.
- Ident—Response object identifier.
- Mode—Specifies DAQ list in module.
- Prescale—Physical name of DAQ list.
- Sampling Mult—Specifies oversampling rate.
- Size—Number of DAQ lists the module will support.
- Start—Specifies the list position.
- Event ID—Identifier for the raster rate.

(Standard CCP settings, please consult relevant ASAM documentation.)



The toolbar along the top of the window also contains a number of icons. These includes an 'Import from A2L File' button once again. There is also an 'Import from Presets' button, which re-opens the 'CCP Protocol Presets' window above. The window also contains a 'Default' button allowing restoration of original settings.

However, there are also 'Add ID', 'Edit ID' and 'Delete ID'. The 'Add ID' button opens the 'New DAQ List' window shown below.

Name:		Ident:
		0x0
Mode Event:	Mode Prescale:	Sampling Mult:
0	100mSec 💌	1
DAQ Size:	DAQ Start:	Event ID
0	0x0	0x0

New DAQ List:

• Name—Allows the user to specify the name for the DAQ list.

- Ident—Response object identifier.
- Mode Event—Specifies the DAQ list.
- Mode Prescale—Physical name of DAQ list.
- Sampling Mult—Specifies oversampling rate.
- DAQ Size—Number of Starts allowed.
- DAQ Start—Identifier byte.
- Event ID—Identifier for the raster rate.

(Standard CCP settings, please consult relevant ASAM documentation.)

This windows allows the creation of a new 'DAQ list', which will then appear in the 'Name' panel of the 'New CCP Protocol' window. The 'Edit ID' button reopens the window seen above to allow the user to edit the settings for the 'DAQ list'. The 'Remove ID' allows the user to remove the selected 'DAQ list' from the 'Protocol'. However, at least one 'DAQ List' is required to create a 'CCP Protocol'.

Once all the settings have been configured as required, clicking 'OK' will close the window and create the 'Protocol' as specified.

4.7.4—CAN Monitor Protocol

This section details the options for the 'CAN Monitor Protocol', upon selecting a 'CAN Monitor Protocol' the 'New CAN Monitor Protocol' window will appear as shown below.

÷	New CAN Monitor Protocol		×
CAN Protocol Setti	ngs		
Protocol Name:		Oversample Rate	-
CANMonitor1		10 🚖	
Log All Channels			
	at Slow Bate		
	<u> </u>	<u>C</u> ancel	

CAN Protocol Settings:

- Protocol Name—Allows the user to specify the name for the 'Protocol'.
- Oversample Rate—Specifies the ratio of missed data points to recorded.
- Log All Channels—Selects to record all raw CAN data messages transmitted on the bus.
- Log CAN signals at Slow Rate

Once all the settings have been configured as required, clicking 'OK' will close the window and create the 'Protocol' as specified.



4.7.5—GPS Protocol

This section details the options for the 'GPS Protocol', upon selecting a 'GPS Protocol' the 'New GPS Protocol' window will appear as shown below.

e	New GPS Protocol		×
GPS Protocol Settings			
Protocol Name: GPS and Accelerometer	Protocol	GPS rate Max 💌	
Rate Max		Range +-4G ▼	
	<u>0</u> K	<u>C</u> ancel	

Once all the settings have been configured as required, clicking 'OK' will close the window and create the 'Protocol' as specified.



4.8—Data Items

4.8.1—Introduction

The final step in creating a 'Configuration Structure' is to select the 'Data Items' - the different values or signals to be recorded by the Rebel. The 'Data Items' capable of being logged via each 'Protocol' varies. Therefore each 'Data Item' option will be considered separately in the following sections.

The 'Data Items' available for each 'Protocol' are summarised below.

Data Items	Protocol Types								
	Diagnostic	ССР	CAN Monitor	Instrumentation	Digital	GPS			
PID	V								
Address	\checkmark	~							
Signal			\checkmark						
Channel				\checkmark	\checkmark	~			

Once a 'Data Item' has been added to a 'Configuration Structure' it will appear in the 'Data Items' panel as can be seen in the example below, which contains a number of Mode 0x01 PIDs.

🖾 No.	Rate	Stream	Label	Units	PID	Address	Size	Datatype	^
Ģ [∞] 1	1 Sec	No	02S11	V	0x14	0x00	2	Unsigned Byte	
₽ ⁰ 2	1 Sec	No	02\$12	V	0x15	0x00	2	Unsigned Byte	
₽ ¤ 3	1 Sec	No	02\$13	V	0x16	0x00	2	Unsigned Byte	
Ģ ™ 4	1 Sec	No	02\$22	V	0x19	0x00	2	Unsigned Byte	
₽ [©] 5	1 Sec	No	SHRTFT1	%	0x06	0x00	1	Unsigned Byte	
₽ ® 6	1 Sec	No	SHRTFT11	%	0x14	0x00	2	Unsigned Byte	
₽ [©] 7	1 Sec	No	SHRTFT12	%	0x15	0x00	2	Unsigned Byte	
Ģ ™ 8	1 Sec	No	SHRTFT13	%	0x16	0x00	2	Unsigned Byte	
Ģ ™ 9	1 Sec	No	SHRTFT22	%	0x19	0x00	2	Unsigned Byte	
👰 🕫 10	1 Sec	No	PTO_STAT	-	0x1E	0x00	1	Unsigned Byte	
📮 🗉 11	2 Sec	No	CATEMP12	degC	0x3E	0x00	2	Unsigned Word	
👰 🕫 12	2 Sec	No	IAT	deg	0x0F	0x00	1	Unsigned Byte	
👰 🕫 13	2 Sec	No	ECT	degC	0x05	0x00	1	Unsigned Byte	
👰 🕫 14	2 Sec	No	AAT	degC	0x46	0x00	1	Unsigned Byte	
👰 🕫 15	2 Sec	No	CATEMP11	degC	0x3C	0x00	2	Unsigned Word	
👰 🕫 16	5 Sec	No	EGR_ERR	%	0x2D	0x00	1	Unsigned Byte	
👰 🕫 17	5 Sec	No	CATEMP21	°C	0x3D	0x00	2	Unsigned Word	
👰 🕫 18	5 Sec	No	EVAP_VP	Pa	0x32	0x00	2	Signed Word	
👰 🕫 19	5 Sec	No	CATEMP22	°C	0x3F	0x00	2	Unsigned Word	
⊡ 20	10 Sec	No	AIR STAT: OFF		0x12	0x00	1	Bitfield	Y
<								>	
Properties	Items	PU Explorer							

The 'Data Items' panel contains a 'Rate' icon at the top of the panel, this allows the user to edit the logging rate for the selected 'Data Item(s)' simultaneously.

The 'Data Items' panel also contains a 'right click' menu as shown below. However, this varies depending on the 'Data Items' and not all options will always be identical or available.





• New PID/Address/Channel—Allows the edition of a new 'Data Item', see each section for more detail.

• Properties—Opens the 'Properties' window of the selected 'Data Item', see relevant section for details.

- Select All—Selects all the listed 'Data Items'.
- Copy—Creates an exact replica of the selected 'Data Item(s)'.
- Paste—Places the copied 'Data Items' where selected.
 - Delete—Removes the selected 'Data Item(s)' from the list.

• Change Sampling Rate—Allows the user to reassign the sampling rate for the selected 'Data Item(s)', see individual sections for options.

• Add Item to Triggers—Opens the 'New Condition' window for Triggers

4.8.2—Periodic Identifiers

Periodic Identifiers (PIDs) allow the data logger to identify a data record and at a set rate retrieve the recorded data value for the given data identifier.

There are a number of different methods in DiaLog for adding PIDs to a 'Configuration Structure', these are Manual Addition of a PID, Import of a PID from Presets or Import of a PID from an .ODX file. These different methods are considered individually below.

Within DiaLog it is also possible to copy PIDs from anywhere within the software and paste them into the required 'Configuration Structure'. However, these PIDs can be specific to the vehicle being logged and care must be taken in this respect.



4.8.2.1—Manual Addition of a Periodic Identifier

A PID can be added manually to a 'Configuration Structure' using either the Configuration 'Navigation Bar' menu, the 'Local Projects' 'right click' menu, the 'Items' panel 'right click' menu.

The 'New Data Item' window is shown below.

		New Dat	a Item				×
PID Settings:		Memory Layou	t:		Conversion Me	thod	
Data Item:		Data Type:			Formula	() Table	
PID1		Unsigned Byte		-	Formula	U	
Units:		Msg Size:	Byte Position	n:	Cooff A:	Cooff P:	
		1	0	-	1		1
PID	Mode:	Precision:	Byte Order:		Cooff C	Cooff D:	1
0x0	0x0	0	MSB First	-			1
Sampling method:		Start Bit:	Bit Count:		Eormula:		1
Defined Data Ra	te 💌				x		1
Min Value:	Max Value:	Bit Mask:					1
0	0	0x0			Form	ula Type:	
Log on change:		Output Ident				∆x+B	
Log All Data	-		Assign Ide	ent		Cx+D	
Min Sample (min)	Rate:						
0	20 msec 💌				Description		
Stream Rate							^
None	•						~
<u>D</u> efault					<u>0</u>	K <u>C</u> ance	*

PID Settings:

- Data Item—Specified the PID name.
- Units—Specifies the units for the PID.
- PID—Specifies the Hexadecimal label for the PID.
- Mode—Specified the diagnostic service to be utilised to read the PID.
- Sampling Method—Not currently implemented.
- Min Value—Specifies the minimum value for the data.
- Max Value—Specifies the maximum values for the data.
- Log on change—Selects log method, between all and only on change in value.
- Rate—Designates the sampling rate for the PID.

Memory Layout:

- Data Type—Drop down menu selects the data type.
- Size (bytes) Response length.
- Byte Position—Location of first data byte in returned CAN message.
- Precision—Displayed decimal places.
- Byte Order—Endian format.
- Shift Left/Right—Binary manipulation.
- Bit Mask—Filter required bit.
- Output Ident—Specifies the Hexadecimal label for the output.
- Assign Ident—Allows the user to assign the identifier.



Conversion Method:

• Formula/Table—Allows the user to select between a formula or a predefined 'Conversion Table'

Formula:

- Coeff A—Specify coefficient A in the formula type displayed.
- Coeff B—Specify coefficient B in the formula type displayed.
- Coeff C—Specify coefficient C in the formula type displayed.
- Coeff D—Specify coefficient D in the formula type displayed.
- Formula—Displays the created formula.

Once the required settings for the PID have been entered, clicking 'OK' automatically closes the window and adds the PID to the 'Data Items' panel. The 'Data Item' can be identified as a PID by the icon appearing at the beginning of the item row.

4.8.2.2—Import of a Periodic Identifier from Presets

A PID can be Imported into a 'Configuration Structure' from presets using the 'New PID' toolbar option as shown below.



The 'Select Items' window is shown below.

e de la companya de l		Select	Items					×
Filter								_
PID (Hev)	Label: Units:	Datatune		Mode:				
				-	-			
				·				
Presets	l abel	Mode	Lunite	DataTupa	Description			
	DBD Monitor IDs supported (\$01 - \$20)	900M	Units	Signed Word	Description			- ^
01	ACRE BDY	0x00		Bitfield	A/C system refigerar	t monitoring read	U	
01	ACRE SUP	0x01		Bitfield	A/C system refrigerar	nt monitoring sup	r norted	-
01	AIB BDY	0x01		Bitfield	Secondary air system	n monitoring read	y	-
01	AIR SUP	0x01		Bitfield	Secondary air system	n monitoring supp	orted	-
01	CAT RDY	0x01		Bitfield	Catalyst monitoring re	eady		
01	CAT_SUP	0x01		Bitfield	Catalyst monitoring s	upported		
01	CCM_RDY	0x01		Bitfield	Comprehensive com	ponent monitoring	g ready	
01	CCM_SUP	0x01		Bitfield	Comprehensive com	ponent monitoring	g supported	
01	DTC_CNT	0x01		Bitfield	# of DTCs stored in	this ECU		
01	EGR_RDY	0x01		Bitfield	EGR and/or WT sy	stem monitoring re	eady	
01	EGR_SUP	0x01		Bitfield	EGR and/or VVT sy	stem monitoring s	upported	~
					Pater 100 mSec. ▼		0	
	0.1.1.1	11.5	5				v	_
PID (Hex)	Selected Item	Units	Da	tatype	Hate	Mode		
						<u>o</u> k	<u>C</u> ancel	

The window allows the user to select the required PID from the list of presets, with each one containing the prerequisite settings.

- Locate the required PID or using the filter criteria.
- Click 'Add' to move the selected item to the 'Selected Items' panel.
- Once all the required PIDs are listed in the 'Selected Items' panel, click 'OK' to close the window and import the PIDs.

It is also possible for the user to edit the 'PID presets'



4.8.2.3—Import of a Periodic Identifier from an .ODX File

The final method for importing PIDs into a 'Configuration Structure' utilises an .ODX file, which is specific to the vehicle being logged. A PID can be imported in to a 'Configuration Structure' from an .ODX file using the 'ODX' import tab found on the right hand side of the 'Main' panel as shown below.

ODX .				-++ × ≥
Ty Tx De				DBC
Filters (use **	as wildcard character)	Linite: [) atatura	
			/alalype	▼ ×
ODX Items	Silvin.			7
🕼 Label	PID	Units	Size Datat	ype C
				2
				BE X
<	- 100 0			>

The panel is controlled by the toolbar along the top of the panel.

Click the 'ODX' toolbar icon to open an .ODX file.

Navigate to the required file and click 'Open' to import into the panel—the panel will now list all the PIDs for the vehicle. Locate and select the required PID items manually or by using the filtering criteria. The window also supports the import of .CSV filter files to automatically identify the required selection of PIDs.

Once the required PIDs have been identified the 'Rate' for the items must be selected.

Rate—Drop down menu selects the required logging rate.

With the required items selected and the settings chosen use the 'Copy Items' button to import them into the 'Configuration Structure'.

The panel also allows the imported .ODX file to be removed and a different .ODX file to be imported instead.



4.8.3—Addresses

Memory Addresses allow the data logger to identify a data record and at a set rate retrieve the recorded data value from the given memory location.

There are a number of different methods in DiaLog for adding Address items to a 'Configuration Structure', these are Manual Addition of an Address and Import of an Address from either an .A2L or .ROB file. These different methods are considered individually below.

Within DiaLog it is also possible to copy Addresses from anywhere within the software and paste them into the required 'Configuration Structure'. However, these Addresses are specific to the vehicle being logged and care must be taken in this respect.

4.8.3.1—Manual Addition of an Address

An Address can be added manually to a 'Configuration Structure' using the 'New PID' toolbar as shown below.

₽¦D +	New PID 👻
₽₽	<u>N</u> ew PID
₽¦D	Import PID From Presets
	New Address
⊴ į	E <u>d</u> it PID Presets

The 'New Address Item' window is shown below.

		New Addre	ss Item			×
PID Settings:		Memory Layout	:	Conversion Me	thod	
Data Item:		Data Type: Unsigned Byte	-	Formula	⊖ Table	
Units:		Msg Size:]	Coeff A:	Coeff B:	1
Address: 0x0		Precision:	Byte Order: MSB First 💌	Coeff C:	Coeff D:	ן ר
Sampling method: Defined Data Ra	te 💌	Shift Left	Shift Right	Formula:		1
Min Value: 0 Log on change:	Max Value:	Bit Mask: 0x0 Output Ident]	Form	nula Type: Ax+B	1
Log All Data Min Sample (min) 0	▼ Rate: 100 mSec ▼		Assign Ideni	Description	Cx+D	
Stream Rate	•]				Ç
<u>D</u> efault				<u> </u>	IK <u>C</u> ance	el

PID Settings:

- Data Item—Specified the PID name.
- Units—Specifies the units for the PID.



- PID—Specifies the Hexadecimal label for the PID.
- Mode—Specified the diagnostic service to be utilised to read the PID.
- Sampling Method—Not currently implemented.
- Min Value—Specifies the minimum value for the data.
- Max Value—Specifies the maximum values for the data.
- Log on change—Selects log method, between all and only on change in value.
- Rate—Designates the sampling rate for the PID.

Memory Layout:

- Data Type—Drop down menu selects the data type.
- Size (bytes) Response length.
- Byte Position—Location of first data byte in returned CAN message.
- Precision—Displayed decimal places.
- Byte Order—Endian format.
- Shift Left/Right—Binary manipulation.
- Bit Mask—Filter required bit.
- Output Ident—Specifies the Hexadecimal label for the output.
- Assign Ident—Allows the user to assign the identifier.

Conversion Method:

Formula/Table—Allows the user to select between a formula or a predefined 'Conversion Table'

Formula:

- Coeff A—Specify coefficient A in the formula type displayed.
- Coeff B—Specify coefficient B in the formula type displayed.
- Coeff C—Specify coefficient C in the formula type displayed.
- Coeff D—Specify coefficient D in the formula type displayed.
- Formula—Displays the created formula.

Once the required settings for the PID have been entered, clicking 'OK' automatically closes the window and adds the PID to the 'Data Items' panel. The 'Data Item' can be identified as a PID by the icon appearing at the beginning of the item row.

4.8.3.2—Import of an Address from File

The second method for importing Addresses into a 'Configuration Structure' utilises either an .A2L file, which is specific to the vehicle being logged, or a .ROB file. An Address can be imported into a 'Configuration Structure' from an .A2L file using the 'ASAP' import tab or from a .ROB file using the 'ROB' import tab found on the right hand side of the 'Main' panel as shown below.

A2L			~ 4	×B
Filters	A R R R	3		C OD
Label:	Address (Hex):	Units: Datatype	2	RoB
Show Only Measuremer Displaying 27562 / 4329	nts 17 items Conti.A2L Units	Address	DataType	FIBEX
	[·]		Signed Byte	
🗰 selectation, destatione	[-]	Transford Married Street	Signed Byte	
Mark Mark Mark Jack	[-]	Aug 1 (1993) 328	Signed Byte	
and and a set of the set	[·]	100100000000000000000000000000000000000	Signed Byte	
www.ens.mos.jone	[-]	Bas2103101000000	Signed Byte	
Mark alle and the	[-]	1	Signed Byte	
www.ueinieni	[-]	THE PERSON NEW YORK	Signed Byte	
ing, and , see , got	[-]	Rap1+64400100-071	Signed Byte	
and and and and and the	Ξ.	Nation Company	Signed Byte	
international and and the		Indentifier of	Signed Byte	
the second cost with	¥	Real OFFICE STORE	Signed Byte	
	*	Tax TOTAL TRACTOR	Signed Byte	~
<			>	
	Rate	Byte Or	der	-
Copy Items	100 mSec	👻 Use Až	2L Settings 🛛 🔻	

In this case the 'ASAP Editor' for .A2L files is shown. However the 'ROB Editor' panel is analogous.

The panel is controlled by the toolbar along the top of the panel.

- Click the 'A2L' toolbar icon to open an .A2L file.
- Navigate to the required file and click 'Open' to import into the panel—the panel will now list all the Addresses for the vehicle.
- Locate and select the required Address items manually or by using the filtering criteria. The window also supports the import of .CSV filter files to automatically identify the required selection of PIDs.



Once the required Addresses have been identified the 'Rate' and 'Byte Order' for the items must be selected.

Rate—Drop down menu selects the required logging rate. Byte Order—Drop down menu selects the data byte order preference for the item.

With the required items selected and the settings chosen use the 'Copy Items' button to import them into the 'Configuration Structure'. A 'Data Item' can be identified as an Address by the icon appearing at the beginning of the item row.

The panel also allows the imported .A2L file to be removed and a different .A2l file to be imported instead. Once all the required Addresses have been imported, clicking the 'Tab' again closes the panel.

A2L files can also be swapped within a structure while maintaining the same selected data items. This is particularly useful in development situations, allowing a structure to be rapidly updated to a new software without being recreated.

Allows the user to update the A2L settings for an existing Configuration Structure and list of memory address data items. Structures can be updated to new vehicle software levels simply and quickly.



4.8.4—Signals

Signals allow the data logger to identify individual CAN messages and record their data content. The method in DiaLog for adding Signal items to a 'Configuration Structure' is to import Signals from a .DBC file.

Within DiaLog it is also possible to copy Signals from anywhere within the software and paste them into the required 'Configuration Structure'. However, these Signals are specific to the vehicle being logged and care must be taken in this respect.

A Signal is imported in to a 'Configuration Structure' from a .DBC file using the 'DBC' import tab found on the right hand side of the 'Data Items' panel as shown below.

Signal Label: T	ransmitting Node	Ident (Hex): Units:	-
Displaying 624 / 624 items Signal Name	File: Conti_dbc.dbc Message Name	Ident Unit	s ^
		0x292	
🔨	Service (a station)	0x292	
Collins and the Planeter	VANAL IS LITERIES	0x292	
 Antipatri canti cantino 	1999-18.(T07988)	0x292	
White Balance Will be and the	VANAL AL TAPAR	0x292	
Worthaldcastivianination	VMMLR_TOPHE	0x292	
WHIT AND AND AT A LOSA	1996ad [36, (THP108)	0x292	
MAN PERSONAL PROPERTY.	VARVAL DR., PERFORM	0x292	
Convertises and server whether	Vehicle_Statist	0x292	
And the second second second	WHEN, IN, HIMME	0x292	
NAVE AND AND AND A STREET	VANAL IS LITERIES	0x292	
Contract and constant and	19994 (8.)70798	0x292	
NAME AND ADDRESS OF TAXABLE	VANAL AL TAPAGE	0x292	
New Manufacture Constant	VMM (ALTOPHE	0x292	
A DESCRIPTION OF THE OWNER OF	United in Provide	0x292	Ŷ

The panel is controlled by the toolbar along the top of the panel.

Opens the imported DBC file in the built-in DBC file editor.

Allows the user to import a DBC file.





Removes the imported DBC file from the tab

- Click the 'DBC' toolbar icon to open a DBC file.
- Navigate to the required file and click 'Open' to import into the panel—the panel will now list all the Signals for the vehicle.
- Locate and select the required Signal items manually or by using the filtering criteria. The window also supports the import of .CSV filter files to automatically identify the required selection of Signals.
- With the required items selected use the 'Copy Items' button to import them into the 'Configuration Structure'. A 'Data Item' can be identified as a Signal by the icon appearing at the beginning of the item row.



4.8.5—Channels

Channels allow the data logger to identify an Instrumentation input and record its value. The method in DiaLog for creating Channels in a 'Configuration Structure' is to manually add a Channel.

Within DiaLog it is also possible to copy Channels from anywhere within the software and paste them into the required 'Configuration Structure' in the 'Local Projects'.

A Channel can be added manually to a 'Configuration Structure' using the 'Local Projects' 'right click' menu, the 'Data Items' panel 'right click' menu or the 'Pew Channel' toolbar icon as shown below.

84	New Protocol	<\$ ₄	New Channel	
	New Data List	***	Properties	
`+	Ne <u>w</u> Channel		<u>S</u> elect All	Ctrl+A
	Import Items		<u>С</u> ору	
*	<u>P</u> roperties		Paste	
	Сору	×	Delete	Del
ĥ	Paste		Change Sampling Rate	٠
×	 Delete Del		Log On Change Single/Half Precision Float	· ·
	Save To Presets	F	Add I <u>t</u> em To Triggers	
	Export •	45	Stream	,

The 'New Instrumentation Item' window is shown below.

i .	Net	w Channel				×
Channel Settings:	Memory Layo	ut:		Conversion Met	hod	
Label:	Data Type:			Formula	🔿 Table	
Channel1	Unsigned Wo	rd	-	Formula		
Units:	Size (bytes):	Channel:		Coeff A:	Coeff B:	
mVolts	2	HBox1 A1	-	9.97	-20548	8
Min Value: Max Value:	Precision:	Byte Order:		Coeff C:	Coeff D:	
0	0	MSB First	-	0	1	2
Stream Rate	Start Bit:	Bit Count:		Formula:	12422.00	
None				9.97*x-20548		
Board Range -20V to 20V ▼				Formula Typ	be: <u>Ax+B</u> Cx+D	
Get Range From Rebel	Output Ident	Assign Ident		Fro	m Library	
Default				<u>0</u> k	Cance	!

Warning:

Channels on an 'Instrumentation' bus require an Influx Technology H Box in which to function. The Rebel data logger internal instrumentation board (if specified) is accessed by connecting the external H Box for thermo-couple and analogue inputs.



Channel Settings:

- Label—Allows the user to specify the name for the 'Channel'.
- Units—Specifies the units for the 'Channel'.
- Min Value—Designates a minimum value for the data.
- Max Value—Specifies a maximum value for the data.

Memory Layout:

- Data Type—Drop down menu selects the data type.
- Size (bytes) -
- Channel—Drop down menu selects the required hardware channel.
- Precision—Displayed decimal places.
- Byte Order—Endian format.
- Start Bit— Not used.
- Bit Count—Not used.
- Output Ident—Specifies the Hexadecimal label for the output.
- Assign Ident—Allows the user to assign the identifier.

Conversion Method:

• Formula/Table—Allows the user to select between a formula or a predefined 'Conversion Table'.

Formula:

- Coeff A—Specify coefficient A in the formula type displayed.
- Coeff B—Specify coefficient B in the formula type displayed.
- Coeff C—Specify coefficient C in the formula type displayed.
- Coeff D—Specify coefficient D in the formula type displayed.
- Formula—Displays the created formula.

The window also contains a 'Default' button which allows all settings to be automatically returned to their original states.

Once the required settings for the Address have been entered, clicking 'OK' automatically closes the window and adds the Address to the 'Data Items' panel. The 'Data Item' can be identified as an Address by the icon appearing at the beginning of the item row



5—Rebel Data Loggers

5.1—Introduction

The Rebel data loggers are a family of very powerful tools capable of complex data logging applications. Boasting up to 5 CAN buses, Digital Inputs and Instrumentation including analogue and thermocouple inputs, the Rebel Loggers are capable of logging from multiple sources utilising different protocols simultaneously.

The Rebel Loggers also supports USB, Ethernet, GPRS and Bluetooth connections and GPS and Accelerometer capability.

Interfacing seamlessly with the DiaLog software package, all the Rebel Loggers functionality is easily accessed. This section considers the features which are active with a Rebel data logger connected to DiaLog.

Some of the Rebel Loggers are pictured below:



This section assumes the user is working with the USB connection established, however the features are also available with alternative connection methods.



5.2—Active Configuration

Within the 'Database' panel on the left hand side of the software window there is the 'Rebel' tab, this tab displays the 'Active Configuration' panel as can be seen below.

Active Configuration	
OBD_CAN_Example	A
A CAN 0 (HS)	
EngineController	
A 🔽 🥲 OBD	
▼ ♥ 02S11	
✓ ♥ 02S12	
🗸 💆 02S13	
✓ [†] 02S22	
🔽 🤠 SHRTFT1	
🔽 🤠 SHRTFT11	
- 🔽 草 [□] SHRTFT12	
🔽 호 SHRTFT13	
- 🔽 😇 SHRTFT22	
V 🛡 PTO_STAT	
- ✓ 💇 CATEMP12	
🗸 🤠 IAT	
- 🔽 😇 ECT	
🗸 🧟 🗛 T	
🗸 🤠 CATEMP11	
🔽 😇 EGR_ERR	
- ✓ 💇 CATEMP21	
VAP_VP	•

The 'Active Configuration' panel is designed to display the current condition of the Rebel data logger and allows the user to interact with the device in a number of ways.

Ensure the Rebel is connected. Once connected DiaLog will automatically read the Rebel data logger and update the 'Active Configuration' panel displaying the 'Progress' window below.

Please Wait	×
Tasks	
91%	X [

As can be seen the 'Configuration Structure' is displayed in an analogous manner to the 'Local Projects' panel. This allows simple and familiar navigation of all the components of the 'Configuration Structure' currently active on the Rebel.

The 'Active Configuration' panel also contains a toolbar at the top of the panel and a 'right click' menu as can be seen below.



- Refresh Active Configuration—This allows the user to instruct DiaLog to read the 'Active Configuration' from the device.
- Copy—This provides the user the facility to create a duplicate of any part of the 'Configuration Structure' to place in an alternative 'Project' in the 'Local Projects' panel.

As in the 'Local Projects' panel upon highlighting an item within the 'Configuration Structure' a summary of the details of the item are displayed in the 'Properties' panel.


5.3—Live Rebel Connection

5.3.1—Introduction

With Rebel connected to DiaLog, it is also possible for the device to be simultaneously connected to the vehicle/module it is configured to data log. Upon connection of the Rebel to the vehicle it will automatically configure itself and begin data logging from the vehicle.

In this situation a number of features are enabled and these are considered in this section. A summary of the section is shown below.

5.3.2—Data Logging Control

With the Rebel connected to both DiaLog and a vehicle it is possible to use DiaLog to control whether it is data logging. This is achieved through the toolbar at the top of the software window as shown below.



- Start Allows the user to instruct the Rebel device to commence data logging.
- Send Configuration to the Logger Allows the user to, in one process, update the Rebel device with the selected 'Configuration Structure' from the 'Local Projects' panel and automatically configure the Rebel and commence data logging.
- Stop -Allows the user to instruct the Rebel to cease data logging



5.3.3—Live Data

With the Rebel simultaneously connected to DiaLog and logging from a vehicle it is possible to use DiaLog to monitor the data being recorded in real time. This is called 'Live Data' and is initiated using the 'Active Configuration' panel as seen below.



The 'Live Data' tool is largely analogous to the 'Oscilloscope' tool featuring most of the same functionality. The tool is controlled by the toolbar as shown below.



Plotting Live Data

Once the required 'Data Items' have been added to the 'Live Data' tool, the user must instruct plotting to begin.

Allows the user to start and stop plotting of the 'Data Items'.



5.4—Rebel Data Logger

With the Rebel connected to DiaLog there are a number of tasks that can be performed using the software. Some Important Functions are accessed using the 'Rebel Explorer' Section of the Logger Tab, which opens the following panel as shown below:

Date created

18.02.2016 08:20



Configuration1_RBLL832_	20160218_082054.IVD	43 KB	18.02.2016 08:20
Configuration 1_RBLL832_	20160218_082143.IVD	27 KB	18.02.2016 08:21
Configuration 1_RBLL832_	20160218_082211.IVD	12 KB	18.02.2016 08:22
For the best result we recommend	using defragmented	I sd cards!	
18/02/16 08:22:19	Free Space: 13675 MB	(90%)	
Properties Live Data Rebel Explorer			

As can be seen the window displays the current content of the SD Card in the Rebel. Each folder contains all the files related to a specific 'Configuration Structure'. Each folder then contains an .IVS file which is the actual 'Configuration Structure' and any number of .IVD data files. These represent the data logged from the vehicle, with a data file created at the beginning of every new logging session.

Uploading a new 'Configuration Structure'



Allows the user to upload the selected 'Configuration Structure' from the 'Local Projects' panel to the Rebel data logger and automatically set it as active.

Downloading a 'Configuration Structure'



Allows the user to download the selected 'Configuration Structure' from the SD Card in the Rebel data logger into the open 'Project' in the 'Local Projects' panel.

Retrieving Data Files



Allows the user to retrieve data files directly from the Rebel.

Formatting the SD Card



Provides the facility to use the Rebel data logger to format the inserted SD Card. Also provides the option of preserving or deleting the active 'Configuration Structure'. This allows the card to be cleared of unwanted .IVS and .IVD files without effecting the active 'Configuration Structure' or associated data files.



Setting the Rebel Time and Date



Opens a dedicated window which allows the user to manually configure the time and date settings for the internal Rebel clock.

Rebel Data Logger Information and Settings



Gives the user access to a summary of all the details for the Rebel as displayed in the window shown below. The window opens with the 'Manufacturing Info' tab open as default.

e de la companya de l		Logo	ger Information			×
Manufacturing In	fo User Inf	GPRS Setting	gs WiFi Set	tings		
Manufacturing I	information					
-General Informa	tion					
Serial numb	er RBLL832					
Hardware Versi	on CT 3.7	Secondary CPU	PC1788	Date of mar	Day Mo nufacture 08 0	nth Year 2 16
Hardware Inform	nation				Alternative Interf	ace
🗹 WiFi	Bluetooth	🗹 GPRS	🗹 Acceler	ometer		
🗌 Flex Ray	LAN	🗹 GPS			WiFi device	ice e S device
						Update

Manufacturing Information:

General Information:

- Hardware Version—Displays the hardware version installed in the data logger.
- Date of Manufacture—Displays the date of commissioning.
- Serial Number—Displays the data logger unique serial number.
- Secondary CPU—Details the Secondary Processor

Hardware Information:

- Accelerometer—Displays if the internal device is installed.
- Bluetooth—Displays if the internal device is installed.
- FlexRay—Displays if the internal device is installed.
- GPRS—Displays if the internal device is installed.
- GPS—Displays if the internal device is installed.
- LAN—Displays if an Ethernet port is present in the logger.
- WIFi—Displays if an WiFi radio is present in the logger



e		Logger I	nformation		×
Manufacturing Info	User Info	GPRS Settings	WiFi Settings		
User Information					
User Name Max Log Time 6 hours 💌	Max File Si 500 Mbyte mat from Rebel	ze		S]
☐ Delete oldest file v	vhen SD card is I	full		Update	

User Information:

User Info:

- User Name—Your Name.
- Max Log Time—Maximum length of recordings, after reaching this length of time a new file will be created.
- Max File Size—Maximum size of recordings, after reaching this size a new file will be created.
- Allow SD Card Format from Rebel—Allows the Rebel to format the card.
- Delete oldest file when SD card is full—If set when the SD Card is full the oldest recording will be deleted when space is required for new recordings.

The window also contains an 'Update' button which allows the settings to be sent to the Logger.



e de la companya de			Logger Ir	nformation	×
Manufacturing In	ifo l	Jser Info	GPRS Settings	WiFi Settings	
GPRS settings					
GPRS Provider APN	Settings interne	t		Load from presets	
Default User	web	e. Asia. Africa	Password	web	
StreamLog Link	Settings 213.91	.193. 4			
				Updat	te

GPRS Settings:

GPRS Provider Settings:

- APN—The Access Point Name for the Gateway from the GPRS network to the internet.
- Default User—The username.
- Default Password—The password

The GPRS Provider Settings may also be loaded from presents if available.

StreamLog Link Settings:

Server IP—The IP Address of the StreamLog Server you wish to use.

The window also contains an 'Update' button which allows the settings to be sent to the Logger.



÷		Logger :	Information	×
Manufacturing Info	User Info	GPRS Settings	WiFi Settings	
General Advance	ed			
 Obtain an IP addre Use the following If IP Address: Subnet mask: Default gateway: DNS: 	ss automatically address	ettings	WiFi network PSK SSID Security Open StreamLog Link Settings Server IP 0. 0. 0. 0	Scan Wi-Fi Update

WiFi Settings:

IP Address Settings:

- Obtain an Ip address automatically—The IP Address, Subnet Mask, Default Gateway and DNS Server addresses will all be obtained via DHCP
- Use the following IP address—Used to manually assign the IP Address, Subnet Mask, Default Gateway and DNS Server addresses.

WiFi Network Settings:

- PSK—The pre shared key
- SSID—The service set identifier (name of the WiFi Network)
- Security—The level of encryption you wish to use

Clicking Scan WiFi will allow you to select the WiFi Network for those that are in range, this will allow you to correctly set the SSID and Security level automatically

Advanced Tab:

The Advanced Tab contains settings to allow Extensible Authentication Protocol encapsulation to be configured, it also allows a proxy server to be configured.

The window also contains an 'Update' button which allows the settings to be sent to the Logger.



5.5—SD Card

DiaLog has the ability to interact with an SD card independently of the Rebel data logger. This allows SD cards to be edited in a separate location to the data logger and used to remotely configure any Rebel. With an SD card inserted in the card reader, the features are accessed through the 'Rebel Explorer' on the Logger Tab which opens the window shown below.

D Folders	Size	Date created
🗉 💴 Influx Tech		1
Configuration1		
Configuration 1. IVS	2 KB	18.02.2016 08:20
Configuration 1_RBLL832_20	160218_082054.IVD 43 KB	18.02.2016 08:20
Configuration1_RBLL832_20	160218_082143.IVD 27 KB	18.02.2016 08:21
Configuration 1_RBLL832_20	160218_082211.IVD 12 KB	18.02.2016 08:22
For the best result we recommend us	sing defragmented sd card	s!
For the best result we recommend us	sing defragmented sd card ree Space: 13675 MB (90%)	s!

As can be seen the window displays the current content of the SD Card in the Rebel. Each folder contains all the files related to a specific 'Configuration Structure'. Each folder then contains an .IVS file which is the actual 'Configuration Structure' and any number of .IVD data files. These represent the data logged from the vehicle, with a data file created at the beginning of every new logging session.

Uploading a new 'Configuration Structure'



Allows the user to upload the selected 'Configuration Structure' from the 'Local Projects' panel to the Rebel data logger and automatically set it as active.

Downloading a 'Configuration Structure'



Allows the user to download the selected 'Configuration Structure' from the SD Card in the Rebel data logger into the open 'Project' in the 'Local Projects' panel.

Retrieving Data Files



Allows the user to retrieve data files directly from the Rebel.

Formatting the SD Card



Provides the facility to use the Rebel data logger to format the inserted SD Card. Also provides the option of preserving or deleting the active 'Configuration Structure'. This allows the card to be cleared of unwanted .IVS and .IVD files without effecting the active 'Configuration Structure' or associated data files.

Provides the facility for the user to fully format the selected SD Card, removing all data from the SD card.



Warning:

All new SD cards must be formatted **in the Rebel** prior to use. This is performed using the Rebel Explorer.

Note:

Configuration Structure priorities between the Rebel and SD card—An active structure on an SD card will always take priority over the Rebel. However, if a blank SD card is inserted into a Rebel with a structure on-board this will automatically be loaded to the SD card.

Note:

If the 'Delete oldest file when SD card is full' setting in the User Info section of the Logger Information is unchecked, and the SD card becomes full, the Rebel will stop logging. This feature ensures no data can be overwritten before it has been retrieved. The data can either be cleared or a new formatted SD card inserted and the Rebel will automatically continue logging.



6—Data Retrieval and Handling

6.1—Introduction

This section covers all the possible methods of retrieving data recorded by the Rebel data logger. This includes directly from the Rebel and from the SD card using both DiaLog and Windows.

Data handling is then covered including data import and export options along with file merging and conversion methods to a number of different file formats.



This section details the method which allows the retrieval of data files directly from the Rebel when online and connected to DiaLog.

The data retrieval is performed using the 'Rebel' window which is accessed using the 'Rebel' toolbar icon. Which opens the 'Rebel' window as shown below.



SD Folders	Size	Date created
🖃 💴 Influx Tech		
Configuration 1		
Configuration 1. IVS	2 KB	18.02.2016 08:20
Configuration 1_RBLL832_2016021	8_082054.IVD 43 KB	18.02.2016 08:20
Configuration 1_RBLL832_2016021	18_082143.IVD 27 KB	18.02.2016 08:21
Configuration 1_RBLL832_2016021	18_082211.IVD 12 KB	18.02.2016 08:22
For the best result we recommend using (defragmented sd cards!	
8/02/16 08:22:19 Free Sp	ace: 13675 MB (90%)	
Properties Live Data Rebel Explorer		

Retrieving Files from the Rebel Data Logger

It is possible to retrieve any file(s) from the current SD Card in the Rebel by highlighting the required file and utilising either the 'right click' menu or 'Get Files' toolbar icon.

This allows the user to save any required files from the Rebel data logger SD Card, directly on to their system. Once the file has saved, DiaLog will prompt whether the user wishes to import the retrieved data file into the 'Analysis' section of the software automatically.



6.3—Data Retrieval from an SD Card

The Rebel utilises the FAT32 file system to write the recorded data to the SD card meaning that the card is directly accessible from Windows.

As such there are two methods for accessing the data on an SD card. The first method utilises Windows to explore the SD card as with any other media storage and save the data files directly to the computer. Data retrieved with this method can then be imported using the 'Analysis' section of DiaLog.

The second method involves utilising the 'Rebel Explorer' section directly to locate the files on the SD card as can be seen below.



SD Folders		Size	Date created
🖃 💴 Influx Tech			
Configuration 1			
Configuration 1. IVS		2 KB	18.02.2016 08:20
Configuration 1_RBLL832_20	160218_082054.IVD	43 KB	18.02.2016 08:20
Configuration 1_RBLL832_20	160218_082143.IVD	27 KB	18.02.2016 08:21
Configuration 1_RBLL832_20	0160218_082211.IVD	12 KB	18.02.2016 08:22
For the best result we recommend u	using defragmented	sd cards!	
18/02/16 08:22:19 F	ree Space: 13675 MB	(90%)	
Properties Live Data Rebel Explorer			



6.4—Data Handling

6.4.1-Merging Multiple Data Files

DiaLog contains a feature which allows the user to select multiple .IVD data files to be merged into a single .IVD data file. This allows data files that are created using the same 'Configuration Structure', perhaps consecutive logging sessions over a period, to be merged into a single file covering the entire period to aid analysis.

The facility is accessed using the Analysis Table by clicking the Merge IVD Files Button.

The 'Merge IVD Files' button opens a dedicated window as shown below:

: ¹	Please choose files to merge			×
Browse Folders	IVD Files (Press F5 to Refresh)			
E:V	Name	Date	Size	
Coniguration	Configuration1_RBLL832_20160218_082054.IVD	18/02/2016 08:20:54	44032	
	Configuration1_RBLL832_20160218_082143.IVD	18/02/2016 08:21:42	27136	
	Configuration1_RBLL832_20160218_082211.IVD	18/02/2016 08:22:10	1334272	
	Configuration1_RBLL832_20160218_194321.IVD	18/02/2016 19:43:20	3584	
	Configuration1_RBLL832_20160218_201312.IVD	18/02/2016 20:13:12	257024	
	Configuration1_RBLL832_20160218_201812.IVD	18/02/2016 20:18:12	4256768	
			Save	<u>C</u> ancel

- Using the drop down menu at the bottom of the window select the drive—this will open in the panel.
- Navigate to the required directory in the 'Browse Folders' panel—this will open in the 'IVD Files' panel, displaying any .IVD files present.
- Select the required data files to be merged.
- Click 'Save' to select the location for the merged file and begin the process—this may take some time depending on the number and size of the files.



6.4.2—Exporting Data Files to Alternative File Formats

All data recorded by a Rebel is stored in a dedicated .IVD file format. However, this is not directly compatible with alternative data analysis software. DiaLog therefore contains a tool which allows .IVD data files to be exported to a number of alternative file formats for import into other software.

This facility is accessed by the 'Batch Processing' button on the Analysis Tab, which opens a dedicated window as shown below.

Ва	tch data processing		×
ultiple file data treatment			
File conversion File merging & convert Or	e-shot reports 🛛 😰 Data extraction		
Input file(s)			
🗟 🕼 🔂 🙀 🚺 🔺 🗸 🗋 🛍			
Output format	Output settings		
O Measurement Data Format 3.2 (Vector MDF)	Store converted file(s) in same folder as original one(s)		
Matlab 5.0 format (support IEEE 754 Double)	Store converted file(s) in custom folder	VSB	
Matlab 5.0 Structure Extended (support IEEE 754 Double)	Renumber IVD files and tabs together using first file as base		
OnCode S3 time series format			
National Instruments DIAdem			
President states (Teles)	Deserve	Course	

The tool contains the ability to individually convert multiple files to the same format or to simultaneously merge and convert the data to a single file. The tab of the window allows individual file conversion.

Output format:

- MDF—binary measurement data storage file format.
- MATLAB 5.0—supporting 64bit floating point precision.
- MATLAB 5.0 Structure—supporting either 32bit or 64bit floating point precision.
- MATLAB 5.0 Structure Extended—supporting 64bit floating point precision.
- nCode S3 time series format
- CSV—Comma separated variables.
- TDM—National Instruments DIAdem

Output settings:

Selects the location the processed file(s) will be stored to

The conversion panel has two options. The first only permits files recorded with the same 'Configuration Structure' to be converted. This allows the user to select specific 'data items' only to be exported to the converted files.

- Using the 'Add Files' or 'Add Folders' button locate and import the required data files.
- Select the required 'data items' to be exported.
- Select the location for the exported files, either the same folder or 'browse' for an alternative.
- Select the required output format for the files.
- Click 'Export' to close the window and begin the process.

The second option allows the user to convert IVDs created with different 'Configuration Structures' simultaneously. Due to this only the complete data file can be exported and individual 'data items' cannot be selected.



W.

Toggles between single and multiple 'Configuration Structure' option.

With the matching 'Configuration Structure' filter off, data files recorded with different structures can be selected as shown below.

		Batch data processin	ng			
ple file data treatmen	t					
File conversion	File merging & convert	One-shot reports	Data extracti	ion		
nput file(s)						
🗟 📢 🔂 🌆	🔺 💙 📑 🛅					
:\Configuration1_RBLL83 :\OBD_CAN_Example_RE	2_20160218_201312.IVD 3LL832_20160218_011418.IVI	D				
Output format		Output settin	gs			
Output format Measurement Data For	mat 3.2 (Vector MDF)	Output settin	gs erted file(s) in same	folder as original one	e(s)	
Output format Measurement Data For Matlab 5.0 format (sup	mat 3.2 (Vector MDF) port IEEE 754 Double)	Output settin Store conv Store conv	gs erted file(s) in same erted file(s) in custor	folder as o <mark>riginal one</mark> n folder	e(s)	
Output format Measurement Data For Matlab 5.0 format (sup Matlab 5.0 Structure for	mat 3.2 (Vector MDF) port IEEE 754 Double) prmat IEEE 754 - Single	Output setting Store conv Store conv	gs erted file(s) in same erted file(s) in custor	folder as o <mark>riginal one</mark> m folder	e(s)	Browse
Output format Measurement Data For Matlab 5.0 format (sup Matlab 5.0 Structure for Matlab 5.0 Structure E Node S3 time series for Comma delimited (CSV	mat 3.2 (Vector MDF) port IEEE 754 Double) ormat IEEE 754 - Single xtended (support IEEE 754 Do ormat format)	Output setting Store conv Store conv Store conv Renumber	gs erted file(s) in same erted file(s) in custor IVD files and tabs to	folder as original one m folder ngether using first file	e (s) e as base	Browse
Output format Measurement Data For Matlab 5.0 format (sup Matlab 5.0 Structure for Matlab 5.0 Structure E OnCode S3 time series for Comma delimited (CSV National Instruments E	mat 3.2 (Vector MDF) port IEEE 754 Double) prmat IEEE 754 - Single xtended (support IEEE 754 Do prmat format) IAdem TDM	Output setting Store conv Store conv Renumber	gs erted file(s) in same erted file(s) in custor IVD files and tabs to	folder as original one n folder ugether using first file	e as base	Browse
Output format Measurement Data For Matlab 5.0 format (sup Matlab 5.0 Structure fr Matlab 5.0 Structure E nCode S3 time series fr Comma delimited (CSV National Instruments D	mat 3.2 (Vector MDF) oport IEEE 754 Double) ormat IEEE 754 - Single xtended (support IEEE 754 Do ormat format) IIAdem TDM	Output setting Output setting Store conv Store conv Renumber *	gs erted file(s) in same erted file(s) in custor IVD files and tabs to	folder as <mark>original one</mark> m folder ugether using first file	e(s) e as base	Browse

Once the process has been started the window below displays the progress.

	Converting		⊐ ×	
File name	······································		Status	
Configuration1_RBLL832_20	160218_082054.IVD		Successful	
Configuration1_RBLL832_20		Successful		
Configuration1_RBLL832_20		Successful		
Configuration 1_RBLL832_20	Configuration 1_RBLL832_20160218_201312.IVD			
Configuration1_RBLL832_20)160218_201812.IVD		Processing	
Elapsed time: Remaining time: Files:	00:00:05 Calculating 4/5	Total size: Speed: Processed:	5.645 MB Calculating 1.585 MB	
	92%		Abort	

The window shows show key statistics for the conversion process along with a completion percentage bar.

The window also allows the user to completely cancel the conversion process by aborting the 'Converting' progress window.



The second tab contains the merge and convert functionality:

ipie file data	treatme	nt				
File convers	sion	File merging & convert	One-shot reports	👘 Data ex	traction	
Input file(s)					Items (17 selected)	
6 6	R .	🗸 🗸 👔 👔 🙀			YVEAVI	0
Configuration	11\Configu 11\Configu	ration1_RBLL832_20160218 ration1_RBLL832_20160218_	082054.IVD 082143.IVD		 ang_thr[0] GPS Acceleration X GPS Acceleration Y GPS Acceleration Z GPS Altitude GPS Course GPS Direction GPS Geold GPS Geold GPS Satellites GPS Speed GPS Temperature Rehel GPS 	
Interpolati	gs e data				version rules configuration	
Resample	data	Merge offset between reco	rdings		-	Edit New
50 ms	*	200 ms	*	File format		
Output file nar	ne			Matlab 5.0 form	nat	
						Browse

Items:

Allows the user to select specific items within the chosen IVD files to process into the output file.

Output settings:

- Interpolate data—selects to use interpolation when merging files at the selected rate.
- Last sample every—opts to insert the last recorded data value at the selectable frequency.
- Point offset—specifies the number of interpolation points between input files.
- Offset between recordings—interprets the interpolation rate and point offset into time.
- Using the 'Add files' or 'Add folder' button locate and import the required data files.
- The 'Up' and 'Down' arrows can be used to alter the order the files will be merged in.
- The 'Data Items' from the data files to be processed can be selected if only a sub-group are required. The data items can also be selected by importing a filter file, the arrows allow order selection.
- Using the 'Output settings' select the required output format and file name and the interpolation and merging offset. The offset is the number of interpolation point's gap and therefore must be a multiple.
- Click 'Process' to begin the merge and convert procedure.

The data selected to be exported can be defined around individual trigger events.

Opens a new panel listing all the trigger events, allowing pre and post trigger timing definition, as shown below.

Trigger filtering details

¥

Trigger	PreTrigger time (sec)	PostTrigger time (sec)
🗹 InitialLog (Initial)	0	2
🗹 FinalLog (Final)	0	0

To export only data around each trigger event, the user can define pre and post-trigger periods of data for each trigger, which is selected to be exported using the satellite box.



If the process is ran using interpolation, it is possible that some files may contain no data or different sample counts in some channels. In this instance the tool will prompt the user with the window shown below.

Missir	Missing data						
Information Some of the selected items for convertion have no outputed data channels. This can affect some 3rd p length of each item channel.	data in some of the fi party scripts to not wo	les. This will produce (ork properly if they requ	different length of uire strict data				
Item channels with missing data			1-10-10-10-10-10-10-10-10-10-10-10-10-10				
Files	GPS Altitude	GPS Course	GPS Direction				
Configuration1_RBLL832_20160218_082054.IVD	0 samples	0 samples	0 samples				
Configuration1_RBLL832_20160218_082143.IVD	0 samples	0 samples	0 samples				
Configuration1_RBLL832_20160218_082211.IVD	0 samples	0 samples	0 samples				
Configuration1_RBLL832_20160218_201312.IVD	0 samples	0 samples	0 samples				
Configuration1_RBLL832_20160218_201812.IVD	0 samples	0 samples	0 samples				
<			>				
Continu	e Exclude item	ns Exclude files	Cancel				

The window provides the user four options to proceed:

- Continue—Continue merged conversion unchanged.
- Exclude Items—Remove problematic items and continue.
- Exclude Files—Remove problematic files and continue.
- Cancel—Abort current batch merging process.

Create a Batch Exporting Script

The tool also allows the user automatically create a batch script to perform the selected data processing. This allows large volumes of data to be processed in one go.



Allows the user to create a save a Batch file, containing all the data processing settings selected in the tool. All settings must be selected in the window before the script is created. To run the created batch file, simply double click the icon.

Note:

For the conversion or merging of large numbers of data files, DiaLog contains a command based version of the tool. Full details of this can be found in the dedicated user guide—Batch conversion and merging guide.



6.4.3-Exporting Multiple Event Reports

All 'Trigger events' which occur during a logging session are stored in the IVD file. The 'events' can then be exported to a summary report. DiaLog contains a tool which allows the user to export multiple Event reports to a single report. This facility is accessed by the 'Batch Processing' button on the Analysis Tab, which opens a dedicated window as shown below, and then selecting the One Short Report Option:

		Batch data processin	g	□ ×
Itiple file data tre	atment			
File conversion	🛒 File merging & convert	🐖 One-shot reports	Data extraction	
Input file(s)	L832_20160209_132933.IVD		Item groups	
Output settings Output file name]	Browse
Create separa	te files per Trigger			
			Process	Cancel

Item groups:

Allows the selection of the recorded trigger events contained within the listed data files to be exported in the report.

The panel also provides the option to append additional data into the report.

Adds all additional data recorded in the IVDs to the report.

Allows the user to select specific data items from the loaded IVDs to append to the report. Opens a dedicated window shown below.

	DAQ	items		×
7 1				
Select mul	iple DAQ items	\$		
✓ ang th	r[0] sim vb			~
B nmo	t sim and thr	01		
V DrDrvC	pen_B_Indic	15000		
🗸 DrDrv0)pen_B_IndicF	ť		
	pen_No_Qf			
	Jpen_No_QIFt			
✓ ari ✓ dri moi				-
✓ dri_tar	etcu			
✓ dri ta	iner ena			
✓ drv0_e	r —			
✓ drv1_e	r			
✓ drv2_rr	mv_er	122		
thr_pct	[_cor_amp_dit	_tq_		
<pre> thr_pct thr_pct</pre>	Loor_pr	oold of		
✓ thr_pet	l_cor_tba_dif_	bot of		
the pot	Loor too dif	of		Y
		ОК	Cance	1

- Using the 'Add files' or 'Add folder' button locate and import the required data files.
- Select the location for the exported files using the 'browse' button.
- Select whether to export each event list to a separate file with the satellite button.
- Click 'Process' to close the window and begin the process— the status of the export is indicated in the 'Status Message' panel



7—Data Analysis

7.1—Introduction

DiaLog contains a powerful suite of data analysis tools to enable the user to quickly and intuitively assess the data recovered from the Rebel. The data analysis functionality of DiaLog is accessed via the 'Analysis' tab as shown below. In this case an .IVD data file recorded using an example 'Configuration Structure' is displayed in the 'Recording Analysis' panel.



The 'Recording Analysis' panel displays any imported .IVD data files in an analogous manner to the 'Configuration Structure', enabling quick and familiar navigation of the data.

Importing a Data File

To import a data file into the 'Recording Analysis' panel there are a number of methods, the file can be retrieved from the Rebel data logger or the file can be imported manually from a saved location, or an SD card.

To manually import a data file into DiaLog there are two possible methods. Firstly use the Import Tab and select Import Recorded Data

The second method uses the dedicated 'Import Panels' found on the right hand side of the software window when the 'Recording Analysis' panel is open:

Folders		^
🞯 Desktop		~
C:V		^
Users		
User		
Desktop		×
IVD Files (Press F5 to Refresh)		
Name	Size	Date
Configuration1_RBLL832_20160218	251 KB	18/02/2016 20
OBD_CAN_Example_RBLL832_2016	25 KB	17/02/2016 05
OBD_CAN_Example_RBLL832_2016	13 KB	18/02/2016 01
Trigger Test_RBLL832_20160211_16	337 KB	17/02/2016 00
<		>

The 'Import Panels' allow the user to locate and import the required data file into DiaLog.

• Using the drop down menu at the bottom of the panels select the drive—this will open in the bottom panel.

• Select the required directory in the bottom panel—this will open displaying the files in the top panel.

• 'Double click' the required file to import into the 'Recording Analysis' panel.

This process allows the efficient working between multiple data files and simplifies the import process.

Once a data file has been successfully imported into the 'Recording Analysis' panel, a summary of each item in the displayed 'Configuration Structure' can be displayed in the 'Properties' panel by highlighting the required item.



For each data file highlighted in the list, a summary of the trigger events recorded in the file is displayed as shown below.

Settings		
Vehicle	Configuration 1	^
VIN	****	
Calibration ID	****	
Software ID	****	
User	****	
Date	18/02/16	
Logger Type	Standard - Fast Sampling Rates Only	
Logger Mode	Standard - All CAN Messages	
Number of PIDs	0	
Number of Diagnostic Addresses	0	
Number of CCP Addresses	5	
Number of CAN Signals	0	
Number of Instrumentation Channels	0	
Number of Digital Channels	0	
		~

Properties DTC OBD CAN Trace



7.2—Oscilloscope

7.2.1—Introduction

The Oscilloscope tool in DiaLog contains all the software's data analysis functionality. There are a number of different ways to access the Oscilloscope.

Opening an Oscilloscope

The main method uses the Analysis Tab 'Show Scope' toolbar button as shown below.



The 'Show Scope' button automatically displays all open Oscilloscope windows, if no Oscilloscope windows exist a new empty Oscilloscope window will be created. The drop down menu from the toolbar icon lists all existing Oscilloscope windows and allows the user to open the required one.

Adding Data Items to the Oscilloscope

The second method for accessing the Oscilloscope window involves adding a 'Data Item' or a selection of 'Data Items' simultaneously to an existing or new oscilloscope. The method uses the Analysis Tab 'Add to Chart' toolbar button as shown below.

£			
Projects	Logger	Analysis	StreamLog
Add	l To Chart	Show	Scope -

The 'Add to Chart' function is only active once at least one 'Data Item' satellite box has been checked, the items with checked boxes will then be added to the Oscilloscope.

	Choose Option >							
Choose	• A Window	Or Create Ne	ωOne					
Oscillo	scope 1	0.00000.000	T					
		0.100407-00752-0						
🗹 Incl	ude extende	d GPS data						
Endian	Cottings							
	Settings							
Oseit	em settings							
Choose	Monitor							
Monito	nr 1		-					
THO HIG	21 - 1		10.00					

The user is prompted to choose the Oscilloscope to add the 'Data Items' to.

• Choose a Window or Create New One—Allows the user to select and existing Oscilloscope from the drop down menu or type a name to create a new one.

• Endian Settings—Allows the user to select the byte order for the 'Data Items'.



Once the required Oscilloscope has been selected the window will appear as shown below.



The window contains three tabs, found on the right hand side of the window, which allow the user to access the different sections of the data analysis functionality.

7.2.2—Oscilloscope Functionality

7.2.2.1—Introduction

The 'Oscilloscope' window contains two main sections, the 'Information' panel on the left hand side and the 'Main' panel on the right hand side which provides three different features. Each are considered separately below.

The 'Oscilloscope' window is controlled by three separate toolbars, the main window toolbar is considered below.

R	B	DBC	÷	Oscilloscopes	• 📰 • 🗐	∎ ⊉	کر ک	E] -	
1	2	3	4	5	6	7	8	9	10	11

- 1 Load File to Oscilloscope—Allows the user to select an .IVD data file to import.
- 2 Export Current Oscilloscope Signals Set—Allows the user to export the current Oscilloscope as a .DAT file.
- 3 Import Signal Definitions from DBC
- 4 Import MUX Information from DBC
- 5 Show Another Existing Oscilloscope—Drop down menu displays all existing Oscilloscopes to open
- 6 Load Oscilloscope Template—Allows the user to import a pre-created template of an Oscilloscope.
- 7 Save Oscilloscope Template—Allows the user to save the current Oscilloscope as a template file.
- 8 Edit Name of Current Oscilloscope Signals Set—Allows the current selection of items to be grouped and named.
- 9 Print Oscilloscope—Allows the user to print the current display in the Oscilloscope.
- 10 Adjust General Oscilloscope Settings—Opens a dedicated window considered in detail below.
- 11 Delete the Selected Oscilloscope—Permanently closes the current Oscilloscope window.



Each oscilloscope window allows the user to export the signal data contained within them. The user is provided a number file formats to export to:

- Vector MDF (.DAT)
- MATLAB 5.0 (.MAT)
- MATLAB 5.0 Structured single or double precision (.MAT)
- MATLAB 5.0 Structure Extended (.MAT)
- Comma Separated Variables (.CSV)
- nCode S3 time series files (.S3T)
- National Instruments TDM files (.TDM)
- National Instruments TDM streaming files (.TDMS)

Once the required file format and location to save the file have been selected, the user is provided the option to select various options:

Exp	ort optio	IS	×
General sample processing options			
Do not change items sampling rate			
O Change each item sampling rate using	interpo	ation	
Use fixed rate when processing sam	ples at	100 ms	*
Align beginning of file time range by cre Align ending of file time range by creating	ating add	itional samples from Oms nal samples after last ones	
Combine sampling rates from all iter	ns		
O Configure specific conversion rules for	each ite	m separately	
			*
		New	Edit
Configure exportable items and time range	ontion	s	
	Т	-	
All items from ascilloscope window		Entire log (full time renge)	
	Č	Use current time range	
O Only selected item(s)		Use time range between cursors	
O Custom (single item)	C	Custom time range (sec)	
	-	from 0 to 299.624	
		OK	Cancel



7.2.2.3 Oscilloscope Signals Management

Items in the Scope can be Managed, e.g. removed, grouped, selected, hidden. The functions to do this are available by right clicking on the Items.

¥	<u>R</u> emove	Del
•	<u>P</u> hysical	Ctrl+P
	<u>D</u> ecimal	Ctrl+D
I	Eit selected item(s) data	Shift+F12
N	R <u>e</u> set scaling (ungroup)	Ctrl+R
	Group and rescale	Ctrl+G
X	Group and scale to	
1	Group by units and rescale	Ctrl+M
1	Group by EventList and rescale	e Ctrl+M
	<u>S</u> elect all	Ctrl+A
	Dese <u>l</u> ect all	Shift+Ctrl+A
	Invert selection	Shift+Ctrl+I
	S <u>h</u> ow item(s)	Ctrl+S
	Hide i <u>t</u> em(s)	Ctrl+U
	Sho <u>w</u> all items	Ctrl+V
L _	Hide <u>a</u> ll items	Ctrl+H
	Ti <u>m</u> e offset	Ctrl+T
	Color	•
۹.	Edit current analysis name	Ctrl+F3
0	Item properties	

There is also a tool bar to perform commonly used tasks:





7.2.2.4 Defining Calculated Channels

fx Allows the user to define calculated channels. Opens a dedicated window as shown below.

ame					9-00-			Units		Туре			
*****										64b	it IEEE	754 Doi	ble
escripti	ion												
Gene	ric form	ula	Pred	efined	Bi	twise log	gic						
X	<=	=	and	sin	COS	tan	In	lg	exp	1	8		pi
>	>=	l=	or	asin	acos	atan	abs	sqrt	^	+))	e
													g
													~
ate											🗌 Us	e conve	rsion
	164 2008	215-21 V								*	Draf	<u>estatolo</u> Necesia	1010101



7.2.2.5 Oscilloscope Settings

Chart Colors Ite	em columns Track overla	у	
able values	Values	Point symbol	Symbol size
raw values (decimal) 🔹 👻	physical values 🔹	Cirde •	3
Show labels Mult	axis mode Show DTCs	Show grid	
Show labels Mult Advanced settings Advanced settings Automatically close em Hide charts when ever	i axis mode Show porte i axis mode Show DTCs pty oscilloscopes y one item have less than2	Show grid	

Chart tab

- Values—Drop down menu selects the value type to be plotted.
- Point Symbol—Drop down menu selects data point style.
- Symbol Size—Specifies the plotting size of a data point symbol.

Initial Settings:

• Allows the user to select the initial settings for an Oscilloscope on opening.

Advanced Settings:

- Automatically close empty oscilloscopes—Automatically close any Oscilloscope windows not containing 'Data Items'.
- Hide charts when every one item have less than () samples—Chose to hide data plots for items with minimal data points.
- Create new tab on gap longer than () milliseconds—Separates data with greater than specified gap for display in oscilloscope.
- Create new tab on gap longer then () milliseconds—Separates data with greater than specified gap for display in oscilloscope.
- Hide charts when every one item have less than () samples—Allows the user to select display any items charts with minimal data points.



Chart	Colors	Item columns	Track overlay	
Ba	ackground colo	r	Axis color	Reset
Item co	lors			
	Line 1 color		Line 7 color	Line 13 color
	Line 2 color		Line 8 color	Line 14 color
	Line 3 color		Line 9 color	Line 15 color
	Line 4 color		Line 10 color	Line 16 color
_	Line 5 color		Line 11 color	Line 17 color
_	Line 6 color		Line 12 color	Line 18 color

Colours tab

- Background Colour—Selects the backing colour for the graph section of the Oscilloscope.
- Item Colours—Allows the selection of the Oscilloscope plotting colour for each item listed in the 'Information' panel.

The tab also contains a 'Reset' button to return the settings back to default.

	Os	cilloscope settings		
lvanced oscilloscop	e settings			
Chart Colors	Item columns	Track overlay		
∧ ∨ ♥ ≡				
Caption	Width (px)	Description		^
al 🗖	20	Item ID		
7	20	Item visible status (checkbo	x)	1
Color	40	Item color		
_ Group	64	Item group name		
🗹 Name	128	Item name		
🖌 Units	64	Item measurement units		
🗹 Value	64	Current item value		
🗹 Hex value	64	Current item hex value		
Cursor 1	64	Item value at Cursor #1		
Cursor 2	64	Item value at Cursor #2		~
			OK	Cancel

Item Columns tab

• Allows the user to select the information columns to be displayed for the items listed in the 'Information' panel using the satellite boxes.

The order the columns will be displayed in can also be altered using the 'Up/Down Arrow' toolbar icons.



vanced osci	loscope	settings				
Chart C	Colors	Item columns	Track	overlay		
Color map		Units		Marker size (m)	Scale (%)	
Normal	-	Metric (SI)	*	20	\$ 100	\$

Track Overlay tab

• Allows the user to adjust the appearance of the Track displayed when GPS data is being interpreted.



7.2.2.6 Information Panel

The 'Information' panel displays all the 'Data Items' currently added to the Oscilloscope or all the .IVD data files the 'Data Items' have been taken from depending on the tab selected, as shown below. The Buttons on the Left allow 'Loaded Files' the 'Explorer' and the 'Items' to be shown or hidden as follows:

ID File	name	Time offset	File nath	
1 Co	name ofiguration1	A sec	C-V	1
1 00	Ingoradorn_	. 0 800	0.1	
<				
Explor	rer			
di Co	nfiguration	1 RBL1.832 20	160218 2013	12
menn i	mormation	1		
	niormation		Z • 🔍 🕻	
rtein i F	indermation fx fx or fx] 🔲 🖂 fø &	Units	с,
	or Name	"] 🖬 🖸 <i>fø 🐼</i>	Units	c ·
	or Name	(0) cceleration X	Units G	с, С
	or Name ang th GPS A	for for for the second se	Units G G	с С О О
	or Name ang_th GPS A GPS A GPS A	r(0) cceleration X cceleration Y cceleration Z	Units Units G G G	C - 0 0 0
	or Name ang_th GPS A GPS A GPS A GPS A	r(0) cceleration X cceleration Y cceleration Z litude	Units Units G G G G G meters	C -
	or Name ang th GPS A GPS A GPS A GPS A	r(0) cceleration X cceleration Y cceleration Z lititude course	Units Units G G G G G meters Degrees	C 0 0 0
	or Name ang th GPS A GPS A GPS A GPS A GPS C GPS C	f(0) for for for the formation of the fo	Units Units G G G G G meters Degrees Degrees	C - C - C - C - C - C - C - C - C - C -
	or Name ang_h GPS A GPS A GPS A GPS A GPS A GPS C GPS C GPS C	f(D) cceleration X cceleration Y cceleration Z lititude iourse tirection ieold	Units Units G G G G meters Degrees Degrees meters	C / 0 0 0 0
	or Name ang_h GPS A GPS A GPS A GPS A GPS C GPS C GPS C GPS C	r(0) ccceleration X ccceleration Y ccceleration Z lititude course friection iecold	Units Units G G G Degrees Degrees meters	C - C - C - C - C - C - C - C - C - C -
	or Name ang_th GPS A GPS A GPS A GPS C GPS C GPS C GPS C GPS C GPS C	r(0) ccceleration X ccceleration Y ccceleration Z litude iourse virection recold 'osition Fix atellites	Units Units G G G G Meters Degrees Degrees meters Degrees meters	C 0 0 0 0 0 0 0 0 0 0

The 'Information' panel functionality is controlled by a dedicated toolbar considered below.



Important Functions include:

- Reset Scaling of Selected Item(s) Removes any scaling operations applied to the selected items.
- Rescale Group of Selected Items Synchronising Axes—Automatically scales the selected items to allow display simultaneously on a single set of axes.
- Custom Scale Group of Selected Items Synchronising Axes—Allows the user to select the scaling to a single axis.
- Group Items by Units and Rescale Each Group Synchronising the Axes—Automatically scales the selected items to a single axis for each unit type.
- Select All Items—Selects all items.
- Deselect All Items—Deselects all items.
- Show Detailed Item Properties—Opens the dedicated window considered below.



Item Details

Basic Tab

2	Item d	etails [ang_thr[0]]	>
Specifi	item properties		
Basi	Recording Chart		
Item	name		
ang	thr[0]		
Units		Item handle	Message handle
[%]		0x0500	0x3000
Bus \	Module \ Protocol		
CAN	0 (High Speed) \ Module 1 \ Conti_	xCP	
Data	type		
16bit	Signed Integer (Big Endian)		
Conv	ersion formula		
(A *	raw + B) / (C * raw + D)		
A	В	С	D
1	0	0	327.6799927
0.00			
			OK Close

- Item Name—Displays the Item name.
- Units—Displays the designated units for this item.
- Sampling Method—Displays the sampling method used.
- Sampling Rate—Displays the rate at which the item was sampled by the Rebel data logger.
- PID—Displays the Hexadecimal identifier for the 'Data Items'.
- Mode—Designates the diagnostic service to record data.
- Low Range Bound—Specifies minimum value.
- High Range Bound—Specifies maximum value.
- Item Handle—Internal program use.
- Message Handle—Internal program use.
- Conversion Formula—Displays any conversion formula applied.
- A—Display coefficient A in the formula.
- B—Display coefficient B in the formula.
- C—Display coefficient C in the formula.
- D—Display coefficient D in the formula.



Item Details

Recording Tab

	Item deta	ails [ang_thr[0]]	
ecific item properties			
Basic Recording	Chart		
File name			
Vehicle name			
Configuration 1			
Identifier		IVS creation date	Software version
0x000000056C57C19000	00	18/02/2016	4

Calibration ID		Software ID	
****		Software ID	
Calibration ID **** Logger type		Software ID **** Logger mode	
Calibration ID ***** Logger type Standard - Fast Sampling F	Rates Only	Software ID **** Logger mode Standard - All CAN N	Messages
Calibration ID ***** Logger type Standard - Fast Sampling F Alarm 1	Rates Only	Software ID **** Logger mode Standard - All CAN M Alarm 2	Messages
Calibration ID **** Logger type Standard - Fast Sampling F Alarm 1 Inactive	Rates Only	Software ID **** Logger mode Standard - All CAN N Alarm 2 Inactive	Messages
Calibration ID **** Logger type Standard - Fast Sampling F Alarm 1 Inactive	Rates Only	Software ID **** Logger mode Standard - All CAN N Alarm 2 Inactive	Messages

- File Name—Displays the .IVD data file the item was imported from.
- Vehicle Name—Displays the 'Configuration Structure' the item was data logged using.
- Identifier—Internal program use.
- IVS Creation Date Displays the 'Configuration Structure' creation date.
- Software Version—IVD file version for backward compatibility.
- Vehicle Identification Number—Displays the Vehicle Identification Number, if entered.
- Author—Displays the author of the 'Configuration Structure', if entered.
- Calibration ID—Displays the calibration identity, if entered.
- Software ID—Displays the software identity, if entered.
- Logger Type—Displays the sampling mode selected.
- Logger Mode—Displays the logger operational mode if selected.
- Alarm 1—Displays the date for Alarm 1.
- Alarm 2—Displays the date for Alarm 2.



Item Details

Chart Tab

			Item details [ang_thr[0]]		>
ecific ite	em properties	s			
Basic	Recording		Chart		
Display			Values	Color	
visible		*	physical values -	Maroon	*
Axis scale	e Min		Axis scale Max	Line width	
4.53491	221040301		15.3747562018912	1 px	
Time offs	et		Physical value offset	Line style	
0			0	Solid	

- Display—Drop down menu selects the display status of the chart for this data item.
- Values—Drop down menu selects the data type to plot.
- Colour—Drop down menu selects the plotting colour for this item.
- Axis Scale Min—Designates the minimum value of the y axis.
- Axis Scale Max—Designates the maximum value of the y axis.
- Line Width—Drop down menu selects the plotting line width.
- Time Offset—Specifies a time offset for the x axis if required.
- Physical Value Offset—Specifies an offset automatically applied the data values.
- Line Style—Drop down menu selects the plotting style for the item line.



7.2.2.7—Oscilloscope Panel

The 'Oscilloscope' panel displays the plots for all the 'Data Items' currently added to the Oscilloscope, an example plot can be seen below.



The 'Oscilloscope' functionality is controlled by a dedicated toolbar which is considered below. Each feature is then considered individually.

and a	ė	🖾 L 🗗 🥳 🏥 🍣 🔯 🖌 🔛 🚳 🗄 💷						
1	2	3 4 5 6 7 8 9 10 11 12 13 14						
1		XY Scatter Plot						
2		Show each Lap data per item						
3		Show all Items						
4		Hide all Items						
5		Show steps between data points						
6		Separate Items on Oscilloscope						
7		Axis display modes						
8		Show item points						
9		Show point labels						
10		Show Trigger Events on Oscilloscope						
11		Show Diagnostic Trouble Codes on Oscilloscope						
12		Show Cursors						
13		Lock Cursor time difference						
14		Locate Data in Oscilloscope from Item Data Panel						



Show the steps between Data Items

In the normal plotting mode, the oscilloscope tool automatically interpolates between points to draw a continuous trace through the data points. This mode allows the user to select to display the step in value between each recorded data point. An example of each display mode can be seen below.



Separate Items on Oscilloscope

The default mode for the oscilloscope displays the plots for all the data items overlaid, displaying the axis for the currently selected 'Data Item'. The 'Separate' function allows the user to display each 'Data Item' on an individual set of axis, an example can be seen below.



With the plots separated the user can scroll through the plots user the cursor on the right of the panel. The number of plots displayed at once can be selected by clicking the number at the top of the scroll bar.



Axis display modes

In default mode, the oscilloscope displays a single axis for the currently selected 'Data Item', this mode allows an axis for each data item to be displayed simultaneously as can be seen below.



With the multiple axes displayed, they can be moved independently by the user. The selected axis also highlights the corresponding plot.

Show item points

This feature allows the user to select to display all the recorded data points for the currently plotted 'Data Items' as can be seen below.





Show point labels

The oscilloscope contains a feature which allows the user to label particular data points of interest. A label is added to a data point using the 'right click' menu shown below.



The feature then allows the user to display all the point labels for the plotted 'Data Items' as shown below.





Show cursors

The Oscilloscope features double cursors, which allow the user to measure time differences, but also display the value for each 'Data Item' at the cursor location time as can be seen below.



Lock cursor time difference

The tool also features the ability to lock the cursors at a set time difference, only allowing both to move simultaneously.


7.2.3—Item Data

The 'Item Data' section of the Oscilloscope allows the user to display all the data points collected for the selected 'Data Item' in the 'Item Information' panel. The 'Item Data' panel is accessed using the 'Item Data' tab as shown below.

Item	data															×
×	ang_thr[0]	× b_k15	_sim_vb	× B_r	nmot_sim_ang_thr[0]_	× vb_ra	w									
ID	Time(sec)	Raw		Physical [CA	N me	essa	age						
0	0		1818		5.54809582672455		40	14	07	07	4E	00	00	00		
1	0.01		1818		5.54809582672455		40	1 A	07	07	4E	00	00	00		
2	0.02		1818		5.54809582672455		40	1 A	07	07	4E	00	00	00		
3	0.03		1818		5.54809582672455		40	1A	07	07	4E	00	00	00		
4	0.04		1818		5.54809582672455		40	1A	07	07	4E	00	00	00		
5	0.05		1818		5.54809582672455		40	1 A	07	07	4E	00	00	00		
6	0.06		1818		5.54809582672455		40	1A	07	07	4E	00	00	00		
7	0.07		1818		5.54809582672455		40	1A	07	07	4E	00	00	00		
8	0.08		1818		5.54809582672455		40	1 A	07	07	4E	00	00	00		
9	0.09		1818		5.54809582672455		40	1 A	07	07	4E	00	00	00		
10	0.1		1818		5.54809582672455		40	1A	07	07	4E	00	00	00		
11	0.11		1818		5.54809582672455		40	1 A	07	07	4E	00	00	00		
12	0.12		1818		5.54809582672455		40	1 A	07	07	4E	00	00	00		
13	0.13		1818		5.54809582672455		40	1 A	07	07	4E	00	00	00		
14	0.14		1818		5.54809582672455		40	1A	07	07	4E	00	00	00		
15	0.15		1818		5.54809582672455		40	1 A	07	07	4E	00	00	00		
16	0.16		1818		5.54809582672455		40	1A	07	07	4E	00	00	00		
17	0.17		1818		5.54809582672455		40	1 A	07	07	4E	00	00	00		
18	0.18		1818		5.54809582672455		40	1 A	07	07	4E	00	00	00		
19	0.19		1818		5.54809582672455		40	1A	07	07	4E	00	00	00		
<															>	•

The panel opens displaying the recorded values for the 'Data Item' currently selected in the 'Item Information' panel. Additional 'Data Items' can be added by clicking on them in the 'Item Information' panel. With more than one 'Data Item' present in the oscilloscope window, the 'Item data' panel creates a tab for each 'Data Item' as can be seen above. It is also possible to have both the 'Oscilloscope' and 'Item Data' panels displayed simultaneously by selecting both tabs.

The 'Item Data' panel also contains a 'right click' menu as shown below.



- Export— Allows the item data to be exported to .txt file.
- Item Properties— Re-opens the 'Basic' and 'Recording' tabs of the 'Properties' window.



7.2.4—Route Navigator

The 'Route Navigator' tab of the 'Oscilloscope' window allows the user to display the route taken by the vehicle during data logging. The tool uses the GPS data, if recorded, to plot the position of the vehicle during data logging and superimposes the results over a map, to display the navigated route. As such this feature is only available for .IVD files which were recorded using 'Configuration Structures' containing the 'GPS Bus'. The 'Route Navigator' panel is accessed using the 'Route Navigator' tab and is shown below.



The Route Navigator tab is intended as a visual display of the GPS location data. The Rebel records much more than this including acceleration, altitude and course.



7.2.5—Track Overlay

The 'Track Overlay' tab of the 'Oscilloscope' window allows the user to display Lap Timing for the vehicle during data logging. The tool uses the GPS data, if recorded, to plot the position of the vehicle during data logging display the navigated Track. As such this feature is only available for .IVD files which were recorded using 'Configuration Structures' containing the 'GPS Bus'. The 'Track Overlay' panel is accessed using the 'Track Overlay' tab and is shown below.





7.2.6—Statistics

The 'Statistics' tab of the 'Oscilloscope' window allows the user to display a summary of all the data contained in the window. The summary contains data details and also some key statistics for the data such as root-mean-square and standard deviation. The 'Item Statistic Data' panel is accessed using the 'Statistic' tab and is shown below.

Item statistic dat	Item statistic data										
🐴 💽 😂 📗											
Bus	Module	Protocol	Name	Units	Samples	Start [sec]	End [sec]	Duration [sec]	Lowest value	Highest value	Ave ^
CAN 0 (High Speed)	Module 1	Keyword2000	FUELSYS2		3	57.707	183.328	125.621	0.000000	0.000000	0.00
GPS Bus	Module 1	GPSProtocol	GPS Acceleration X	G	1776	0.000	185.715	185.715	-0.976638	0.124941	-0.3
GPS Bus	Module 1	GPSProtocol	GPS Acceleration Y	G	1776	0.000	185.715	185.715	-0.343816	0.828077	0.03
GPS Bus	Module 1	GPSProtocol	GPS Acceleration Z	G	1776	0.000	185.715	185.715	-1.695277	-0.203067	-0.9
GPS Bus	Module 1	GPSProtocol	GPS Altitude	meters	542	1.543	186.393	184.850	25,100000	61.100000	35.5
GPS Bus	Module 1	GPSProtocol	GPS Course	Degrees	542	1.543	186.393	184.850	0.250000	358.800000	186.
GPS Bus	Module 1	GPSProtocol	GPS Direction	Degrees	0	N/A	N/A	N/A	N/A	N/A	N/A
GPS Bus	Module 1	GPSProtocol	GPS GeoId	meters	542	1.543	186.393	184.850	27.100000	27.200000	27.1
GPS Bus	Module 1	GPSProtocol	GPS Position Fix		542	1.543	186.393	184.850	1.000000	2.000000	1.34
GPS Bus	Module 1	GPSProtocol	GPS Satellites	count	542	1.543	186.393	184.850	8.000000	12.000000	11.8
GPS Bus	Module 1	GPSProtocol	GPS Speed	km/h	542	1.543	186.393	184.850	0.000000	55.763720	29.5
GPS Bus	Module 1	GPSProtocol	GPS Temperature	Degrees	542	1.543	186.393	184.850	0.000000	0.000000	0.00
CAN 0 (High Speed)	Module 1	Keyword2000	IAT	deg	48	2.219	186.730	184.511	30.000000	38,000000	32.2
CAN 0 (High Speed)	Module 1	Keyword2000	LOAD_ABS	%	0	N/A	N/A	N/A	N/A	N/A	N/A
CAN 0 (High Speed)	Module 1	Keyword2000	LOAD_PCT	%	47	3.242	184.008	180,766	0.000000	86.676200	35.1
CAN 0 (High Speed)	Module 1	Keyword2000	LONGFT1	%	16	6.641	182.640	175.999	-7.025300	0.787700	-3.1
CAN 0 (High Speed)	Module 1	Keyword2000	LONGFT2	%	0	N/A	N/A	N/A	N/A	N/A	N/A
CAN 0 (High Speed)	Module 1	Keyword2000	LONGFT3	%	16	6.641	182.640	175.999	99.231500	99.231500	99.2
CAN 0 (High Speed)	Module 1	Keyword2000	LONGFT4	%	0	N/A	N/A	N/A	N/A	N/A	N/A
CAN 0 (High Speed)	Module 1	Keyword2000	MAF	g/s	47	3.921	184.689	180.768	0.420000	37.650000	11.3
CAN 0 (High Speed)	Module 1	Keyword2000	MAP	kPa	0	N/A	N/A	N/A	N/A	N/A	N/A
CAN 0 (High Speed)	Module 1	Keyword2000	MIL_DIST	km	6	26.046	182.986	156.940	0.000000	0.000000	0.00
CAN 0 (High Speed)	Module 1	Keyword2000	MIL_TIME	min	0	N/A	N/A	N/A	N/A	N/A	N/A
CAN 0 (High Speed)	Module 1	Keyword2000	O2S11	V	48	1.200	185.712	184.512	0.000000	0.835000	0.40
CAN 0 (High Speed)	Module 1	Keyword2000	O2S12	V	48	1.543	186.055	184.512	0.000000	0.875000	0.49
CAN 0 (High Speed)	Module 1	Keyword2000	O2S13	V	0	N/A	N/A	N/A	N/A	N/A	N/A
CAN 0 (High Speed)	Module 1	Keyword2000	O2S21	v	0	N/A	N/A	N/A	N/A	N/A	N/A
CAN 0 (High Speed)	Module 1	Keyword2000	O2S22	V	0	N/A	N/A	N/A	N/A	N/A	N/A
CAN 0 (High Speed)	Module 1	Keyword2000	PTO_STAT	-	0	N/A	N/A	N/A	N/A	N/A	N/A
CAN 0 (High Speed)	Module 1	Keyword2000	RPM	rpm	47	2.905	183.671	180.766	0.000000	2890.500000	143:
CAN 0 (High Speed)	Module 1	Keyword2000	SHRTFT1	%	48	1.881	186.393	184.512	-6.244000	6.256800	-1.2
CAN 0 (Hiah Speed)	Module 1	Kevword2000	SHRTFT11	%	48	1.200	185.712	184.512	-7.025300	3.912900	-1.5 ¥

The window contains a toolbar which allows the user to export the summary to .CSV, Excel or HTML format. The data items displayed can also be selected depending on whether the data item has logged data recorded in the IVD. This allows the user to display only data items with recorded data or to display only the data items with no recorded data.



7.2.7—Histogram

The 'Histogram' tab of the 'Oscilloscope' window allows the user to display a Histogram of data items contained in the window, this tab and is shown below.





7.3-Raw CAN Data Retrieval

DiaLog contains the ability within the CAN Monitor protocol to run in a 'listen only' mode which records all the transmitted raw CAN data directly to the SD card.

The raw CAN data can be reviewed once the data file has been imported into the 'Analysis' tab of DiaLog as shown below. Raw CAN data can only be retrieved from data files where the 'Log all' feature was used.

)	Time(sec)	Ident	Bus	CAN Message
	0.000	0x000000C	CAN 0 (High Speed)	66 66 66 66 66 66 66
à.	0.000	0x000000DD	CAN 0 (High Speed)	02 00 14 28 00 00 00 00
	0.000	0x000000DF	CAN 0 (High Speed)	00 00 00 00 02 00 00 00
	0.001	0x000000DC	CAN 0 (High Speed)	00 00 00 00 00 00 00 00
	0.001	0×000000E0	CAN 0 (High Speed)	00 00 00 00 00 00 7D 00
	0.001	0x000000E1	CAN 0 (High Speed)	00 00 17 FF 80 00 00 00
	0.002	0×000000DD	CAN 0 (High Speed)	3D 00 14 00 19 DE C1 F4
	0.002	0x000000DF	CAN 0 (High Speed)	02 3F 00 00 C2 00 80 00
	0.002	0x0000016E	CAN 0 (High Speed)	00 0 <mark>0 00 00 00 00 00 00</mark>
0	0.002	0x00000193	CAN 0 (High Speed)	00 00 00 00 00 00 00 00
1	0.003	0x000001B8	CAN 0 (High Speed)	00 00 00 00 00 00 00
2	0.003	0x00000326	CAN 0 (High Speed)	00 00 00 00 00 00 00 00
3	0.003	0x0000034B	CAN 0 (High Speed)	00 00 00 00 00 00 00 00
4	0.006	0×000000E0	CAN 0 (High Speed)	83 98 83 98 00 00 7D 03
5	0.006	0×000000E1	CAN 0 (High Speed)	00 00 E8 15 7F D2 FF FF
6	0.006	0×0000016E	CAN 0 (High Speed)	00 00 01 FF 00 00 00 00
7	0.007	0x00000193	CAN 0 (High Speed)	00 <mark>00</mark> 64 00 84 00 08 00
8	0.007	0x000001B8	CAN 0 (High Speed)	00 00 00 00 00 00 00
9	0.007	0x00000326	CAN Ø (High Speed)	00 00 01 F4 81 F4 00 00

Properties DTC OBD CAN Trace

In the 'Main' panel there are a number of tabs located at the bottom. The fourth tab opens the 'Broadcast CAN' as shown above. The panel will only populated if the structure was set to 'Log all' on the 'CAN monitor' protocol.

The 'Broadcast CAN' display tab has a limit of 1,000,000 message lines per displayed trace. Any recorded traces longer than this will be automatically cropped. The user is informed by the prompt shown below.

To view the complete trace, it must be exported from DiaLog. This can be performed using one of the toolbar icons at the top of the tab. When exporting raw CAN data the complete recorded messages trace is always exported regardless of any cropping in DiaLog display.

The panel is controlled by the toolbar along the top which allows the CAN trace to be printed or saved to a number of different formats.

CSV CSV

Allows the user to export the complete CAN trace to CSV file format.



Allows the user to export the complete CAN trace to Excel file format.



HTML

Allows the user to export the complete CAN trace to HTML file format.

1	Export -
1	TraceViewer data (*.tvd)
TXT	T <u>r</u> aceViewer text (*.txt)
TXT	Vector ASCII (*.asc)
1	Tr <u>a</u> ce log (*.log)

Allows the user to export the complete CAN trace to a number of common file formats:

- TVD—Module Analyser Trace Viewer file format.
 - TXT—Module Analyser Trace Viewer text file format.
 - Vector ASCII
 - Trace log

•



7.4—GPS Data

The Rebel can be configured to record a whole range of GPS data, this includes the location, altitude and course of the vehicle while logging. The GPS data is stored within the IVD data file.

Oscilloscope 1 [GPS.IVD] × -76 75 DBC 4 Oscilloscopes 👻 📰 👻 📑 🚵 💥 23 -× Oscilloscope Item information * D 🗵 🖉 🗠 🗋 🛃 🍜 🛄 🍣 📭 🗶 🚳 👹 🗄 🗰 🗇 fx Color Name U M H A A A A I Q Q A A ~ GPS h 10 + 0 ~ GPS Acceleration Y G പ G -1 GPS Acceleration Z ~ **GPS** Altitude m 0. 2 D GPS Course ~ -1 D \mathcal{S} **GPS** Direction 60 ~ GPS Geold m 40- GPS Position Fix ~ 200 GPS Satellites ~ CÚ 27.9 ~ GPS Speed kr 27.15 D 27.3 ~ GPS Temperature 1.5 12 10 58 0 0 26.73 46.73 66.73 86.73 106.73 126.73 146.73 166.73 186.7 6.73 Time [seconds] GPS Map [542 recorded points] × 80 AK GREENS LENNE. CTT DR BU: Millwater BANKSID Leaflet | Terms & Feedback 19/02/16 01:56 < 3

The data recorded can be viewed in the oscilloscope using the data item manager, as shown below.

- GPS Acceleration—Records three axis acceleration data.
- GPS Altitude—Records the altitude above sea level of the logger in metres.
- GPS Course—Records the measured heading of direction of travel.
- GPS Direction—Compass indicated direction.
- GPS Geoid—Difference in metres of current altitude to Earth Geoid surface.
- GPS Position Fix—Indication of successfully determined position.
- GPS Satellites—Records the number of satellites the Rebel has locked on to at any time.
- GPS Speed—Records the GPS determined speed of the logger.
- GPS Temperature A built in temperature sensor records the ambient temperature (If supported by your hardware).



8—Advanced Features

8.1—Introduction

This section outlines some of the more advanced features found within DiaLog. They allow the user to create complex and detailed 'Configuration Structures' to suit more comprehensive data logging tasks. The capabilities are accessed using the right click menu that appears when you right click on the Configuration, it is shown below.

114	New Configuration	-
Щ	New Bus	
5	<u>T</u> riggers	•
E,	Ne <u>w</u> /Edit Conversion Table	
~	New/E <u>d</u> it Output Signal	
9	Message Constructor	
*	<u>P</u> roperties	
	<u>С</u> ору	
ĥ	Paste	
×	Delete	Del
î și	Send Configuration to the Logger	
	Send Configuration to SD Card	
٩	Server	٠
III)	Import Configuration	
	E <u>x</u> port	×

The Following items are the Advanced features:

- New/Edit Triggers
- New/Edit Conversion Table
- New/Edit Output Signal
- Message Constructor



8.2—Triggers

The 'Trigger' facility within DiaLog allows the user to create conditions, which upon being met, a number of programmable actions can be assigned. To create a new 'Trigger' use the 'Local Projects' panel 'right click' menu.

The 'Trigger Options' window is shown below.

ŧ.					Trigger Opti	ons								□ ×
New C	Condition 📝	Edit Condition 🖳 D	elete Condition 🗙 Delete All											
Available C	onditions Parameter	0	Operand Parameter 2			Value	Operand	Parameter 3			Value BitM	ask		
Engine Start	Conti xCP->B	nmot sim and thr[0]	Not Used				On Rising				Öx1)		
Key Off	Conti_xCP->b	_kl15_sim_vb	Not Used				On Falling				0x1	l.		
Active Trigg	rigger 🖵 Edi	it Trigger 🖳 Delete	Trigger X Delete All	Durlaut	D-11-7-1	custers -		- cate o	1	Condition C	Discontra	100	2	Red C
Trigger Name	Action	Sample Method	Options	Pre Log Time	Post Log Time (sec.	Condition 1	Log	ic Condition 2	Logic	Condition 3	Debounce (mSec)	LED	Buzzer	Digital Out
InitialLog	Run DAQ list	Sample Initial	After all events log for defined b		2	Engine Star	t ON	.Y	ONLY	-	0	F5	Off	None
FinalLog	Sample	Sample Final				I KEY ON	ON	.1	ONLT		U	F#	UI	None
											I	<u>0</u>	K	<u>C</u> ancel

Creating Trigger Conditions

To create a new 'Trigger' there must first be at least one 'Condition' for the 'Trigger' to depend on. Once the required 'Conditions' have been created the 'Trigger' can be set. The 'Available Conditions' panel is controlled by the toolbar at the top of the panel.

New Condition Allows the user to create a new condition based on any 'Data Item' in the current 'Configuration Structure'. Opens the window shown below.

	New Condition	×
General Settings		
Name		
Condition 1		
Condition :		
Parameter	Parameter 2 Value:	
	▼ Not Used ▼ O Date Item 2	
Parameter 3		
Alue	Value: BitMask:	
Data Item 3	U	
		<u>O</u> K <u>C</u> ancel

General Settings:

• Name—Assigns the name for the condition.

Condition:

• Parameter—Drop down menu selects a 'Data Item' the condition depends on.



- Parameter 2—Allows the user to add or subtract an additional 'Data Item' or value.
- Parameter 3—Specifies the condition with an operand and dependant on either a 'Data Item' or a value.
- BitMask—This allows the user to specify a particular section of a 'Data Item' message to be filtered by the condition. Set the required bits to 1 and the rest to 0.

The completed 'Condition' is summarised as it is built in the 'Condition' bar.

Edit Condition—Re-opens the 'Condition' window above for the selected 'Condition' to allow the user to adjust the settings. 'Condition' settings can also be edited directly in the 'Trigger' window.

Delete Condition-Removes the selected 'Conditions' from the 'Trigger Options' window.

Creating a Trigger

Once a minimum of one 'Condition' has been created, a 'Trigger' can be set to act upon this 'Condition' being satisfied. A 'Trigger' can be created to depend on up to two 'Conditions' and associated logic.



New Trigger Allows the user to create a new 'Trigger' for the current 'Configuration Structure'. Opens the window shown below.

÷	New	Trigger	×
General Settings	Assigned LED Buzzer	Dinital Output	
Trigger 1	None Off	None	
Start for unlimited time			
Action Sample metho	Options Continuous	Pre Log Time Post Log Time Debound Image: None Image: Imag	ce mSec
Condition1	Con Log	dition 2 gic Condition 2 NLY	•
Condition 3 Logic Condition 3 ONLY 💌	▼		Cancel

General Settings:

- Name—Assigns the name for the trigger. •
- Assigned LED—Assigns a function LED on the Rebel to indicate trigger activation

Trigger summary:

- Action—Drop down menu selects the action the trigger will perform.
- Sample Method—If a sampling action is chosen, selects the type.
- Options—Selects the action period.
- Pre Log Time—Specifies the pre trigger logging time.
- Post Log Time—Specifies the post trigger logging time.
- Debounce—Allows the user to specify a minimum time the condition must be satisfied before the trigger is set.
- Condition 1—Drop down menu selects the first condition for the trigger.
- Condition 2—Drop down menu selects whether it is only condition 1 dependant or applies logic with a Condition 2.
- Condition 3—Drop down menu selects whether it is only dependant on two conditions or applies logic with a • Condition 3 or logic to the two previous conditions.

Each option for a trigger is summarised below:

Action:

- Stop—Stops all current data logging action.
- Start—Starts logging the complete current configuration.
- Stop and sample—Stops all current data logging action and performs the chosen sampling.



- Start and sample—Starts logging the complete current configuration and performs the chosen sampling.
- Run DAQ list—Runs the selected DAQ list to specified options.
- Fast sampling—Switches the current data logging to fast sample rate while trigger conditions are satisfied.
- Slow sampling—Switches the current data logging to slow sample rate while trigger conditions are satisfied.
- Sample—Performs the chosen sample method while the trigger conditions are satisfied.

Sample method:

- Mark event—An option for 'Start and Sample', 'Stop and Sample' and 'Sample'. Records the time of trigger event in IVD for later review in oscilloscope.
- Reinitialise triggers—An option for 'Start and Sample', 'Stop and Sample' and 'Sample'.
- Read emissions related DTCs—An option for 'Start and Sample', 'Stop and Sample' and 'Sample'. Retrieves and stores all supported EOBD/OBD diagnostic trouble codes. (Modes 0x3, 0x07 and 0x0A.)
- Read advanced DTCs—An option for 'Start and Sample', 'Stop and Sample' and 'Sample'. Retrieves and stored all advanced diagnostic trouble codes. (Mode 0x18 or 0x19 depending on protocol)
- Read OBD—An option for 'Start and Sample', 'Stop and Sample' and 'Sample'. Performs and stored a complete EOBD/OBDII report of all supported services.
- Read Monitored Status—An option for 'Start and Sample', 'Stop and Sample' and 'Sample'.
- Sample Event List—An option for 'Start and Sample', 'Stop and Sample', 'Sample' and 'Run DAQ list'. For 'Stop and Sample' and 'Sample' it performs the sampling as configured in the 'Event List'. (See Section for creating an 'Event List'.) For 'Start and Sample' and 'Run DAQ list' the 'Event list' is also sampled according to the subsequent chosen options.
- Custom X—An option for 'Start and Sample', 'Stop and Sample' and 'Sample'. This options activates a pre-defined group of user messages to be sent to the vehicle. The message groups are created using the 'Message Constructor' tool

Options:

- Continuous—Selects to log the selected 'Sample Method' continuously.
- After all events log for defined time—Selects to log the 'Sample Method' during the period defined by the 'Post Log Time' after the occurrence of the last event.
- After first event log for defined time—Selects to log the 'Sample Method' during the period defined by the 'Post Log Time' after the first occurrence of the trigger event.
- Whilst conditions are satisfied—Selects to log the 'Sample Method' only while the trigger conditions are satisfied.

For 'Triggers' selected to sample or run an 'Event List', this list must be created separately within the 'Configuration Structure' in order to be sampled. The process for creating an 'Event list' is covered in the section below.

Edit Trigger—Re-opens the 'Trigger' window to allow the user to edit the settings for the selected 'Trigger'. 'Trigger' settings can also be edited directly in the 'Trigger' window.

Delete Trigger—Removes the selected 'Trigger' from the 'Trigger Options' window, but does not affect any 'Conditions'.

Delete All—Removes all 'Conditions' or 'Triggers' from the 'Trigger Options' window and as such the 'Configuration Structure'.

Once the required 'Triggers' have been created, clicking 'OK' will automatically close the window and apply the 'Trigger' settings to the 'Configuration Structure'. For a 'Configuration Structure' with 'Triggers' applied to it the 'Configuration' logo in the 'Local Projects' panel changes to display the presence of 'Triggers' as can be seen below.





8.2.1—Creating an One-Shot List

A 'One-Shot List' can be chosen to be sampled within a 'Trigger'. However, the 'Data Items' to be sampled/ran in the 'One-Shot List' must first be defined and the list created. This is performed within a 'Configuration Structure' using the 'Protocol' 'right click' menu shown below:

8+	<u>N</u> ew Protocol	
2	N <u>e</u> w Data List	
	Ne <u>w</u> Address	
	Import Items	•
*•	<u>P</u> roperties	
F	Сору	
ĥ	Paste	
×	Delete	Del
1	Save To Presets	
LAB	Export All Items to *.LAB file	
	E <u>x</u> port	•

This opens a 'New One-Shot List' window shown below:

£	New Data List	×	Access Mode—Selects the method
Settings Name: DataList1 Access Mode: DAQ Acquisition Sampling Time 1000 m	Addr Size:	Sampling Mode Triggered Read ▼ Data Size: 1 ▼ <u>O</u> K <u>C</u> ancel	 to be used to acquire the 'Data Items' to be added to the list. (Polling for Diagnostic protocols and DAQ for CCP/xCP.) Sampling Mode—Selects the how the list will be sampled. Sampling Time—Specifies the sampling period if relevant. Addr Size—Selects the address size: used protocol to be used to sample the list. Data Size—Selects the data sizes fo the protocol to be used to sample the list.

Once the chosen settings have been selected, clicking 'OK' creates a new 'Event List' in the 'Configuration Structure' under the selected 'Module' as shown below:



Once an 'One-Shot List' has been created it can be populated with the 'Data Items' to be sampled. This is performed in the same manner as adding 'Data Items' to any 'Protocol'. 'Data Items' can be copied and pasted from within the 'Local Projects' or can be imported from industry standard files.

The transmission rate is set by the 'One-Shot List' settings. However, the user can select to stream item from a 'One-Shot List' to StreamLog.

Up to 120 items can be selected within a single 'One-Shot List' with up to 15 lists per structure.



8.3—Output Signals

DiaLog contains a feature which allows a user to program an 'Output Signal' in to a 'Configuration Structure' which configures the Rebel data logger to output a specific signal on a specified 'Bus'. To create a new 'Output Signal' use the 'Local Projects' panel 'right click' menu.

The 'Output Signals' window is shown below.

			Out	out Signals				×
📴 New Ident 🔟 Edit Ident	Delete Ident	- Add Item	/ Edit Item	X Delete Item	Set Output CAN	Export 🗸		
Output Idents	Output Signal Set	tings			Output Signal Byt	e Configuration		
	Transmit Rate	ms			I	tems No No No No No	Item Assigned Item Assigned Item Assigned Item Assigned Item Assigned Item Assigned Item Assigned	Bytes 0 1 2 3 4 5 6 7
					Selected Item Se	ttings		
					Start Byte	Size	Scaling	
					Min Value	Max Value	Byte Orc	ler
						2 1	<u>o</u> k	<u>C</u> ancel

Creating an Output Identifier

An 'Output Identifier' designates the CAN message carrying the required data. Each 'Output Identifier' specifies lines of CAN message and as such can hold 7 bytes of data each.

D New Ident

Ident Allows the user to specify a new 'Output Identifier' and the transmission rate. Opens the window shown below.

ê.	New Out	New Output Ident					
Ident 600		Transmit Rate	•				
		<u>0</u> K	<u>C</u> ancel				

• Ident—Specifies the 'Output Identifier', automatically defaults to a suitable value.

• Transmit Rate—Designates the rate at which the data signal will be sent by the data logger.

Edit Ident—Re-opens the 'Output Identifier' window above to allow the user to edit the settings for the selected 'Output Identifier'.

Delete Ident-Removes the selected 'Output Identifier' from the 'Output Signals' window.



Adding Data Items to an Output Signal

Once an 'Output Identifier' has been created, 'Data Items' can be selected to fill the individual bytes of the associated CAN message. If more items are required a new 'Output Identifier' must be created to provide seven more data bytes.

Add Item—Allows the user to select the required 'Data Items'. Opens the window shown below.

Received and the second se	Select	Item			×
Vehicle Items		Selected Output Signal	Byte Configu	ration	
Resch P13 Gen CAN 1 (MS) CCP CCP		Items		No Item Assigned No Item Assigned	Bytes 0 1 2 3 4 5 6 7
······································		Selected Item Settings			
	•	Start Byte 0 Min Value 0	Size 1 Max Value 1	Scaling 3 Byte Order MSB First OK	▼ Incel

The 'Select Item' window displays the complete selected 'Configuration Structure'. To select a 'Data Item' to add to the 'Output Signal', click on the required item and the left hand panel will display its position in the current 'Output Identifier'.

Selected Item Settings:

- Start Byte—Designates the Byte position in the CAN Messages the data for the item will begin.
- Size—Designates the number of bytes of data for the item.
- Scaling—Designates any scaling to be applied to the data values

Edit Item—Opens the two right hand panels of the 'Item' window above to allow the user to edit the selected item.

Delete Item-Deletes the selected 'Data Item' from the 'Output Identifier'.

Setting Output Signal CAN Bus

Once an 'Output Signal' has been created, the user must select the CAN Bus the signal will be transmitted on.

Set Output CAN—Allows the user to specify which of the Rebel data logger 'CAN Buses' the 'Output Signal' will be transmitted through. Opens the window shown below.



	Choose Output (CAN 🗙
CAN BI	usses IS	•
	<u>0</u> K	<u>C</u> ancel

CAN Buses—Drop down menu selects the Output CAN Bus from the available connections on the Rebel Data Logger.

The 'Output Signals' window is shown below.

Exporting an Head Up Display File

The 'Output Signal' tool also contains a feature which allows the user to create a file designed to configure an Head Up display.

Export HUD—File-Exports the completed 'Output Signal' as a dedicated file to configure the Head-Up Display unit, providing an option of two display formats as shown below.



Clicking 'OK' closes the 'Output Signal' window and applies the settings to the 'Configuration Structure'.

Exporting Rebel Dash File

The 'Output Signal' tool also contains a feature which allows the user to create a file designed to configure Rebel Dash display.

Export Rebel Dash—Creates a USB configuration stick for the Rebel Dash, you will need a blank USB pen drive that fits into the Rebel Dash and is compatible with it.

Exporting DBC File

Export DBC—Allows the user to export the selected output signal settings as a DBC file.



8.4—Conversion Tables

Conversion tables allow the user to automatically convert raw data to engineering units or apply any predetermined scaling. Using a conversion table to determine the method for converting data, the user is not dependent on a single formula. To create a new 'Conversion Table' use the 'Local Projects' panel 'right click' menu.

The 'Conversion Table' window is shown below.

e ⁱ Cre	ate Conversion Table		×
🖶 New 🖳 Delete 🎽 Save To Library 👻 🌉	Import From Library 🛛 🎦 Export	Table 👻 拱 Import Table	
Table List	Conversion Values		
	Input Value Output Value HEX Values		
	Input Value	Output Value	
Table Properties			
Raw Value	0		
Uutput Axis Uutput Units			
Method			
Linear Interpolation		O	
		<u>O</u> K <u>C</u> ancel	

The 'Conversion Table' window contains three main panels: The 'Table List' panel lists all existing 'Conversion Tables' for the selected 'Configuration Structure'. The 'Tables Properties' panel lists all the details of the selected 'Conversion Table' and is used to edit or create a new table as required. The 'Conversion Values' panel then allows the user to input 'Conversion Values' into the table to construct the table.



Creating a Conversion Table

New—Creates a new entry in the 'Table List' panel, the user must then edit the settings to determine the new table.

Table Properties:

- Table Name—Allows the user to specify or edit the 'Conversion Table' name.
- Input Axis—Designates the input signal for the conversion table.
- Input Units—Specifies the units of the input signal.
- Output Axis—Designates the output signal for the 'Conversion Table'.
- Output Units—Specified the units of the output signal.
- Method—Drop down menu allows the user to select the method with which the converted outputs will be calculated.

Conversion Values:

- Input Value—Allows the user to give an input value with a known output value.
- Output Value—Allows the user to specify a known output value for the given input value.
- HEX Values—Selects the 'Values' to be displayed in Hexadecimal format.

Importing a Conversion Table

The window also contains an 'Import Table' option which allows the user to import a 'Conversion Table' from elsewhere in the 'Local Projects' panel.

Import Table—Allows the user to copy a 'Conversion Table' already in existence

Assigning a Conversion Table

Once a 'Conversion Table' has been created it must be assigned. To do this a 'Data Item' must be selected and the 'Properties' window displayed as shown below.

e de la companya de la	Edit Measurement	×
PID Settings:	Memory Layout:	Conversion Method
Data Item:	Data Type:	🔿 Formula 💿 Table
Data Item	Signed Word 🗨	Conversion Table
Units:	Msg Size: Byte Position:	Table Name
[%]	2 0 🗸	Convert mV to m/s
Address	Precision: Byte Order:	Paralant and the second
0xD0015590	3 MSB Last 👻	
Sampling method:	Shift Left Shift Right	
Only Sample Once	0 0	Output Axis
Min Value: Max Value:	Bit Mask:	m/s
-100 99.9969482422	OxFFFF	Input Units Output Units
Rate:	Output Ident	mVolts m/s
Time Synchronous 10ms 🔹	0x0 Assign Ident	Edit Table
		Description
Stream Rate		
None		~
Default		<u>D</u> K <u>C</u> ancel

Selecting the 'Table' satellite button displays the 'Conversion Table' panel and allows the user to select the 'Conversion Table' to be applied to this 'Data Item' from the list. It also gives a brief summary of the 'Conversion Table' and the option to 'Edit Table, which reopens the 'Conversion Table' window.



8.5—Message Constructor

The 'Message Constructor' tool allows the user to create custom messages to be transmitted to a module by the Rebel. To create a new 'User Message' group use the 'Local Projects' panel 'right click' menu.

The 'User Messages' window is shown below.

ii i									Custom Messag	jes			×
Grou	New (Grou	p	Ŗ	Dele	ete G	roup	Ŗ	Import Group	Export Group	Export All G	iroups	4 Þ
Group Activ Activ	o Prop e ve	pertie	es •			Rati 100	e (mS 10	ec)	Outpu	t CAN HS 💌			
U Messa	se Alte ages	rnativ (pre	ve Ide :ss "I	entifie Retu	rs rn" t	Px1 0x7	dent E8 Id ne	w mes	T×1de 0x7E0	ont.			
Messa	Add N ages	Mess	age	CHN	Inse	ert M	essa	ge 🤗	Delete Message Message Type	Triggered	Trigger Event	Store	
1 2 3	02 03 00	10 10 00	03 02 00	00 0C 00	00 00 00	00 00 00	00 00 00	00 00 00	Diagnostic Diagnostic Diagnostic	Not Triggered Not Triggered Not Triggered	Custom A Custom A Custom A	Store Reply Store Reply Store Reply	
	-10												
												<u>0</u> K	Cancel

The window allows user to create any custom message and to set the transmission settings.

Creating a User Message

The window opens with a 'Group' automatically open, messages can be created in 'Groups' with each subject to their own settings. 'Groups' can be created and deleted using the icons at the top of window. Once the required group has been created, to create a message simply begin typing the required message in the second byte of the message line. The zeros will automatically be replaced with the typed characters and the message length byte automatically adjusted as the message is constructed. Additional lines can be added or inserted and lines removed using the 'Messages' toolbar icons.



The window contains a number of settings:

Group Properties:

- Active—Allows the user to determine if the message group is currently active or not, and therefore whether it will be transmitted.
- Rate—Specifies the transmission rate.
- Output CAN—Drop down menu selects the CAN bus for the message transmission.
- Use Alternative Identifiers—Allows the user to specify to use alternative message identifiers for this message group.
- Rx Ident—Designates the identifier for the tester.
- Tx Ident—Designated the identifier for the receiving module.

Messages Properties: (For each individual message line.)

- Diagnostic—Allows the user to select to use the Diagnostic CAN message format for the current message line being created.
- Triggered—Allows the user to select if the transmission is linked to a 'Trigger' event.
- Trigger Event—Assigns the message group to a 'Trigger' 'Sample Method'.
- Store—Determines whether the reply to the message 'Group' is stored.

Once all the required settings have been determined and the message(s) constructed, click 'OK' to close the window and apply the changes to the 'Configuration Structure'.



A—Appendix 1

This Appendix will consider the more advanced user settings within DiaLog to allow the full potential and flexibility of the software to be exploited.

A.1-Reflash

This section details the different settings available within the Reflash window for the Rebel data logger connected to the software The 'Reflash window' is accessed using the Logger Tab and menu button as shown below:



The 'Reflash' window is shown below. The window opens with the 'Firmware' tab as default.

Firmware	Diagnostics	Events		
		Connected Rebel firmware	version D1049P_L1048R	i
			200 🔿	
File name	RLCT_D	1049_L1049R_T8_1802	2.frm 🗸 🧹	
Developed	by	Stefan Nikolov		
Version		D1008R_L1049		4
Date/Time	8	18.02.2016 14:33:42		
		Browse firmwa	are Reprogram	

- Current Rebel Firmware Version—Specifies the firmware currently installed on the connected Rebel.
- File Name—Drop down menu selects the Firmware file.
- Developed by—Specifies the developer of the Firmware file selected.
- Version—Specifies the version of the firmware currently selected.
- Date/Time—Specifies the time the current firmware file was uploaded.



The Diagnostics Tab shown below allows you to easily identify your exact configuration:

Reflash						×
Firmware	Diagnostics	Events				
Serial Number - RE Firmware version D	3LL832 01049P_L1048F	1		^		
FW level CT/LT Board - CT/LT					<u>C</u> lear	
GPRS - Q26xx GPS - CMS1010					Save	
ADC external - HB ADC internal - Pres	ox sent					
Accelerometer - Ll WiFi - RS9110	S3DH					
Wirless connection	n - GPRS	22 201 00210	024051 1975			
SD Free space - 1	4003616 KB	332_20160213	_024951.1VD			
SD Sector 0 - EB GPRS FW - not re	40 D6 46 41 ! auested	54 33 32 55	AA			
GPRS APN -	1					
GPRS Password -				~	Close	

The Event Log details the communication that has occurred:

Reflash						×
Firmware	Diagnostics	Events				
Tx: 05 C0 00 0	0 CO 0 00 56 C6 82			^		
:: F0 00 00 00 00 00 00 00 00 00 00 00 00	000000002				<u>C</u> lear	
Rx: 44 44 31 3	0 34 39 50 5F				Caura	
: 4C 31 30 3 : 00 00 00 00	4 38 52 00 00 0 00 00 00				Save	
Tx: 15 BC 02 0	0 00 00 00 00 00 00	00 00 00 00 00 00 0	0 00 00 00 00 00		Events Log Enabled	
Rx : C0 09 08 0	2 10 7A 02 00					
:: 00 00 00 00	L 38 33 32 00]					
Tx: 04 DC 00 D Rx: 44 44 31 3)C 0 34 39 50 5F					
: 4C 31 30 3	4 38 52 00 00 1 00 00 00					
Tx: 1D BC 04 0		00 00 00 00 00 00	0 00 00 00 00 00			
		-0		~		



A.2—Edit PID Presets

This section details the facility for editing the 'PID Presets'. The 'PID Presets' window is shown below.

		PI	ID Presets			×
PIDs	DTCs					
Filter	T Clear Filters 0 🙀 Import ODX	Export O	DX			
Filter						
PID (Hex)	Label:	ι	Jnits:	Datatype	Mode:	
		1	1		•	-
O Add	🗴 Delete 🕖 Edit 🖉 Post 🧲	Cancel	22 Dele	ete All Mode 0x22		
Presets	ll shal		PID Setting:	5	Memory Layout	
Tim	OBD Monitor IDs supported (\$01 - \$20)	_^^	Units	Mode (Hex)	Data Type:	
	ACRE BDY	- 19		0x6	Signed Word	•
01	ACRE SUP		Formula:		Size:	Byte Position:
01	AIR BDY		x		8	0
101	AIR SUP		MinValue:	MaxValue:	Start Bit:	Bit Count:
01	CAT RDY			0	0 0	0
01	CAT_SUP		Description		Precision:	Byte Order:
01	CCM_RDY		Description	5		MSB First 💌
01	CCM_SUP					MODIFIE
01	DTC_CNT					
01	EGR_RDY				.0	
01	EGR_SUP					
01	EVAP_RDY					
01	EVAP_SUP					
01	FUEL_RDY					
01	FUEL_SUP					
01	HCAT_RDY	_				

The window contains 'Filters' to allow the user to quickly identify the 'PID Preset' to be edited. Once the required 'PID Preset' has been identified and selected a summary of the settings is displayed the two right hand panels, the fields are user editable and the changes can be confirmed or cancelled using the 'Tick' and 'Cross' buttons. The toolbar also contains an option to delete all Mode 0x22 PID presets from the library.

PID Settings:

- Label—Designates the name of the 'PID Preset'.
- Units—Specified the units.
- PID—Hexadecimal address for the PID.
- Mode—Designates the Diagnostic Service utilised to read the PID.
- Formula—Allows a conversion formula to be specified to be automatically applied.
- Min Value—Allows the determination of a minimum permitted value for the PID.
- Max Value—Allows the determination of a maximum permitted value for the PID.

Memory Layout:

- Data Type—Drop down menu selects the data type for the PID.
- Size—Designates the number of bytes for each data item.
- Byte Position—Location of first data byte in returned CAN message.
- Start Bit
- Bit Count
- Precision—Displayed decimal places.
- Byte Order—Selects the order in which the data bytes for the PID are transmitted.



A.3—License Manager

All Influx Technology products are licensed through a central database system. Each product allows the user to manage the licenses for the computer it is installed on. The license manager is accessed through the Help 'Navigation Tab' menu as shown below.

đ.	,			d		DiaLOG 5	.0.0.0 [Conti Test	[2]						□ ×
Projects	Logger	Analysis	StreamLog	Import	Export	Project	Configuration	Advanced Config	Presets	Logger	Analysis	StreamLog	Settings	Help
P Help	o 🚺 Rel	ease Notes	StreamL	og Help 🖡	Rebel Drive	er Guide 📕	Reprogrammi	ing Guide 🎼 Bate	ch processi	ng guide	E Licen	se manager	O About D	iaLOG

The License Manager for all software licenses opens as shown below.

	License manager	×
📕 🔕 🧿 🍪 🤱		
Installed licenses	License properties	
DiaLOG Plus Expired on 20/01/20 Single user license	License identification code	
	Activation identification code	
	Product Allowed seats	
	DiaLOG Plus 3	
	Generated Activation date Expire date	- 165
	20/01/16 20/01/16 20/01/20	
	License status	- 965
	Active	
	Issued to	- 975
	Single user license	< >
	Close	

For full details of Influx Technology product licensing please see the Product Licensing Guide.



A.4—Protocol Priorities

This section details the working priorities within a Configuration Structure regarding CCP and Diagnostic protocols. If either of these protocols is present in structure by themselves then there are no priorities to be considered. However, if both protocols are present then in a single configuration, then the priority needs to be considered by the user.

In the case of both CCP and Diagnostic protocols running, the CCP protocol has the priority as shown below.

- When the logger is powered up, it will first attempt to communicate via CCP to establish the connection.
- Once the CCP/xCP connection has been established then the module will attempt to communicate via the Diagnostic protocol.
- If no CCP connection can be established then the logger will not attempt communication via the Diagnostic protocol.

This means that the CCP module is the master and has priority. Therefore the user must always ensure, that if a structure is configured with a CCP protocol, that this connection can be established.

This priority is established to stop any unwanted waking of modules by Diagnostic polling. Only when the vehicle is awake and therefore allowing CCP/xCP communication, will Diagnostic polling be possible.



B—Appendix 2

This Appendix contains a number of user aids and references, designed to help understanding of the different services and protocols utilised in the software to enable fully exploitation of the software abilities by the user.

B.1—Glossary

Terminology	Definition
A2L	ASAM MCD 2 MC-language
CAN	Controller Area Network
ССР	CAN Calibration Protocol
CSV	Comma Separated Values file
DBC	CAN Database file
DPV	DiaLog Project Vehicles file
DTC	Diagnostic Trouble Code
EEPROM	Electrically Erasable Programmable Read-Only Memory
FAT32	File Allocation Table 32 bit
FEPS	Flash EEPROM Programming Signal
IVD	Influx Vehicle Data file
IVS	Influx Configuration Structure file
KML	GPS data file extension—supported by Google
LIN	Local Interconnect Network
LDF	LIN Database File
LSB	Least Significant Byte
MSB	Most Significant Byte
OBD	On-Board Diagnostics
ODX	Open Diagnostics Exchange file
PID	Periodic Identifier
ROB	
ТХТ	Text file



B.2—CAN Modes

01	Current Powertrain Diagnostic Data
02	Powertrain Freeze Frame Data
03	Emissions Related Powertrain Diagnostic Trouble Codes
04	Clear/Reset Emissions Related Diagnostic Information
06	On-Board Monitoring Test Results for Non-Continuously Monitored Systems
07	On-Board Monitoring Test Results for Continuously Monitored Data
09	Request Vehicle Information
0A	Permanent Status Diagnostic Trouble Codes
10	Diagnostic Session Control Service
11	ECU Reset
14	Clear Diagnostic Information
19	Read Diagnostic Trouble Codes
22	Read Data by Identifier
23	Read Memory by Address
2C	Dynamically Define by Data Identifier
2E	Write Data by Identifier
31	Routine Control
3E	Tester Present
27	Security Access Service
2A	Read Data by Periodic Identifier



B.3—CAN Definitions

Protocol Control Information Name	Symbol	Byt e 1								Byte 2	Byte 3
		7	6	5	4	3	2	1	0		
Single Frame	SF	0	0	0	0	DL				N/A	N/A
First Frame	FF	0	0	0	1	DL higł	1			DL low	N/A
Consecutive Frame	CF	0	0	1	0	SN				N/A	N/A
Flow Control Frame	FC	0	0	1	1	FS				BS max	ST min

- Single Frame (SF) Protocol for short messages, contained in one frame, includes a length descriptor.
 - Data Length (DL) Encoded in at the beginning of the message, the PCI is not included in the data length calculation. DL high and DL low encodes the data length for long messages into twelve bits, allowing a message length of up to 4095 bytes.
- First Frame (FF) The procedure for starting a long message, to be therefore segmented into multiple frames. It is only generated once for each long message, by the sender of the segmented transfer.
 - Data Length (DL) DL high and DL low encodes the data length for long messages into twelve bits, allowing a message length of up to 4095 bytes.
- Flow Control Frame (FC) Used in a long message to control the Consecutive Frame transmissions. Generated by the receiver of a long message, it is the response to a First Frame or the last Consecutive Frame.
 - Flow Status (FS) Codes in the PCI of the Flow Control Frame, it instructs the Consecutive Frame transmission, with two possible values:
 - Clear to Send (CTS, 000B) Resume message transmission, BS max and ST min taken into account by sender on reception of the Flow Control frame.
 - Wait (WT, 001B) Pause transmission and wait for a CTS FC frame. ECU will only except not generate.
 - Block Size (BS max) Designates the maximum number of Consecutive Frames that are accepted in a block (between two Flow Control frames.) Possible values:
 - 0 No other Flow Control frame expected, therefore sender free to transmit all the following Consecutive Frames with the ST min value.
 - 108 BS max 255
 - Separation Time (St min) Specifies the minimum gap between the transmission of the Consecutive Frames only and not between the Flow Control frame and the next Consecutive Frame. Units are milliseconds.
- Consecutive Frame (CF) When sending segmented data in a long message, all frames from sender containing the data are encoded as Consecutive Frames. On receipt of Consecutive Frames the receiver shall assemble the data bytes until whole message received.
 - Sequence Number (SN) Designated the Consecutive Frame number in the current block. Used to detect duplication or loss of Consecutive Frames from a long message.



B.4—Standard OBD Periodic Identifiers

PID	Symbol	Units	Description			
00			Supported PIDs 01-20			
01			Status since DTCs cleared (Includes MIL and DTC status and number)			
02			Freeze DTC			
03	FUELSYS		Fuel system status			
04	LOAD_PCT	%	Calculated engine load value			
05	ECT	Deg C	Engine coolant temperature			
09	SHRTFT1	%	Short term fuel trim (bank 1)			
07	LONGTFT1	%	Long term fuel trim (bank 1)			
08	SHRTFT2	%	Short term fuel trim (bank 2)			
09	LONGTFT2	%	Long term fuel trim (bank 2)			
0A	FRP	kPa	Fuel rail pressure			
ОВ	MAP	kPa	Intake manifold absolute pressure			
ос	RPM	rpm	Engine Speed			
0D	vss	km/h	Vehicle speed			
OE	SPARKADV	Deg	Timing advance (cylinder 1)			
OF	IAT	g/s	Intake air temperature			
10	MAF	%	Mass air flow			
11	ТР	%	Throttle position			
12			Commanded secondary air status			
13			Oxygen sensors present			
14	O2S11	V	Oxygen sensor 1 (bank 1)			
15	02S12	v	Oxygen sensor 2 (bank 1)			
16	02513	v	Oxygen sensor 3 (bank 1)			
17	O2S14	v	Oxygen sensor 4 (bank 1)			
18	02521	v	Oxygen sensor 1 (bank 2)			
19	02522	V	Oxygen sensor 2 (bank 2)			
1A	02S23	V	Oxygen sensor 3 (bank 3)			
1B	02S24	V	Oxygen sensor 4 (bank 2)			
1C			OBD standard vehicle compliancy			
1D			Oxygen sensors present			
1E	PTO_STAT		Auxiliary input status			
1F		s	Run time since engine start			
20			Supported PIDs 21-40			
21	MIL_DIST	km	Distance travelled with MIL lamp			
22		kPa	Fuel rail pressure (relative to manifold vacuum)			
23	FRP_FF	kPa	Fuel rail pressure (diesel)			
24		V	Oxygen sensor 1 wide band lambda equivalence ratio			
25		V	Oxygen sensor 2 wide band lambda equivalence ratio			
26		V	Oxygen sensor 3 wide band lambda equivalence ratio			
27		V	Oxygen sensor 4 wide band lambda equivalence ratio			



PID	Symbol	Units	Description
28		v	Oxygen sensor 5 wide band lambda equivalence ratio
29		v	Oxygen sensor 6 wide band lambda equivalence ratio
2A		V	Oxygen sensor 7 wide band lambda equivalence ratio
2B		v	Oxygen sensor 8 wide band lambda equivalence ratio
2C		%	Commanded exhaust gas recirculation
2D		%	Exhaust gas recirculation error
2E		%	Commanded evaporative purge
2F	FLI	%	Fuel level input
30			Number of warm ups since codes cleared
31		km	Distance travelled since codes cleared
32		Ра	Evaporative system vapour pressure
33	BARO	kPa	Barometric pressure
34		mA	Oxygen sensor 1 wide band lambda equivalence ratio
35		mA	Oxygen sensor 2 wide band lambda equivalence ratio
36		mA	Oxygen sensor 3 wide band lambda equivalence ratio
37		mA	Oxygen sensor 4 wide band lambda equivalence ratio
38		mA	Oxygen sensor 5 wide band lambda equivalence ratio
39		mA	Oxygen sensor 6 wide band lambda equivalence ratio
3A		mA	Oxygen sensor 7 wide band lambda equivalence ratio
3B		mA	Oxygen sensor 8 wide band lambda equivalence ratio
3C	CATEMP11	Deg C	Catalyst temperature sensor 1 (bank 1)
3D	CATEMP21	Deg C	Catalyst temperature sensor 1 (bank 2)
3E	CATEMP12	Deg C	Catalyst temperature sensor 2 (bank 1)
3F	CATEMP22	Deg C	Catalyst temperature sensor 2 (bank 2)
40			Supported PIDs 41-60
41			Monitor status (this drive cycle)
42	VPWR	v	Control module voltage
43	LOAD_ABS	%	Absolute load value
44	EQ_RAT		Command equivalence ratio
45	TP_REL	%	Relative throttle position
46	AAT	Deg C	Ambient air temperature
47		%	Absolute throttle position B
48		%	Absolute throttle position C
49		%	Accelerator pedal position D
4A		%	Accelerator pedal position E
4B		%	Accelerator pedal position F
4C		%	Commanded throttle actuator
4D		mins	Time run with MIL on
4E		mins	Time since DTCs cleared
51			Fuel type
52		%	Ethanol fuel
53		kPa	Absolute evaporative system vapour pressure
54		kPa	Evaporative system vapour pressure
55			Short term secondary oxygen sensor trim (bank 1 and 3)
56			Long term secondary oxygen sensor trim (bank 1 and 3)
57			Short term secondary oxygen sensor trim (bank 2 and 4)
58			Long term secondary oxygen sensor trim (bank 2 and 4)



PID	Symbol	Units	Description
59		kPa	Absolute fuel rail pressure
5A		%	Relative accelerator pedal position
5B			Hybrid battery pack remaining life
5C		Deg C	Engine oil temperature
5D			Fuel injection timing
5E			Engine fuelling rate
5F			Emission requirements vehicle designed to meet
61			Driver engine demand
62		%	Actual engine torque
63			Engine reference torque
64		%	Engine torque
65			Auxiliary in/output supported
66			Mass air flow sensor
67		Deg C	Engine coolant temperature
68		Deg C	Intake air temperature sensor
69			Commanded exhaust gas recirculation and EGR error
6A			Commanded diesel intake air flow control and relative intake air flow position
6B		Deg C	Exhaust gas recirculation temperature
6C			Commanded throttle actuator control and relative throttle position
6D			Fuel pressure control system
6E			Injection pressure control system
6F			Turbocharger compressor inlet pressure
70			Boost pressure control
71			Variable geometry turbine control
72			Wastegate control
73			Exhaust pressure
74		rpm	Turbocharger speed
75		Deg C	Turbocharger temperature
76		Deg C	Turbocharger temperature
77		Deg C	Charge air cooler temperature
78		Deg C	Exhaust gas temperature
79		Deg C	Exhaust gas temperature
7A			Diesel particulate filter
7B			Diesel particulate filter
7C			Diesel particulate filter
7D			NOx NTE control area status
7E			Particulate matter NTE control area status
7F			Engine run time
81			Engine run time for auxiliary emissions control device
82			Engine run time for auxiliary emissions control device
83			Nox sensor
84		Deg C	Manifold surface temperature
85			NOx reagent system
86			Particulate matter sensor
87		kPa	Absolute intake manifold pressure