

# CANfilter

## *User Manual*

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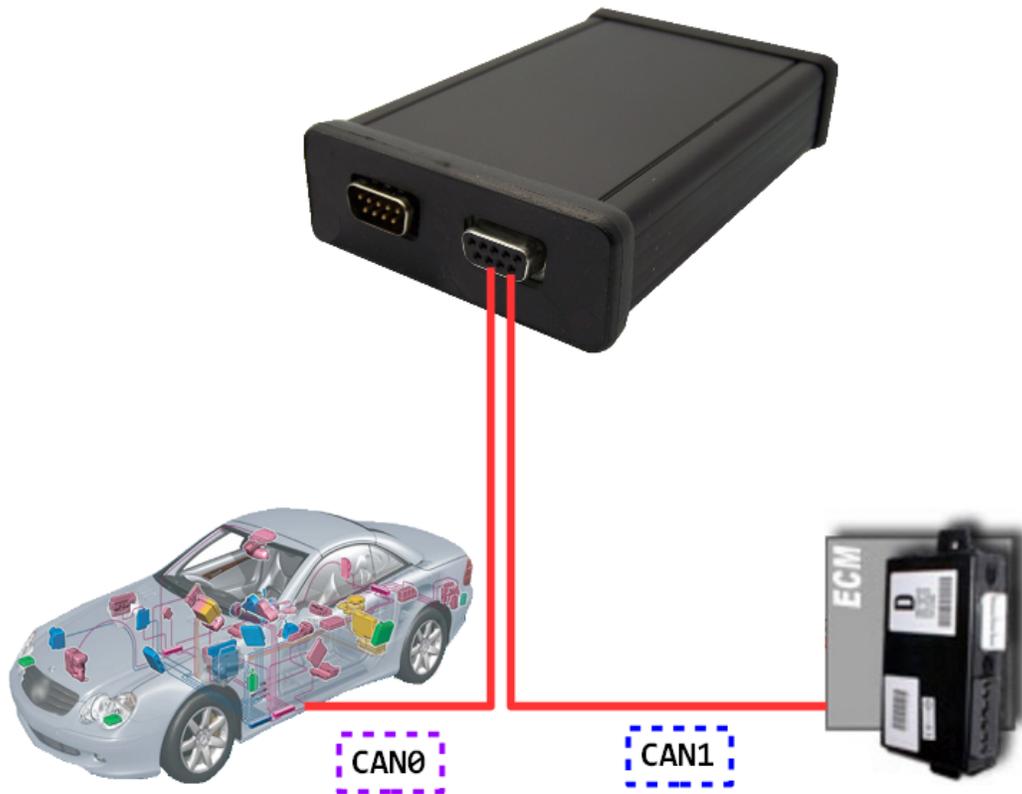
## 1. Safety Precautions and Warnings

To prevent personal injury or damage to vehicles and/or the tool, read this instruction manual first and observe the following safety precautions at a minimum whenever working on a vehicle:

- ✓ Always perform automotive testing in a safe environment.
- ✓ Wear safety eye protection that meets ANSI standards.
- ✓ Keep clothing, hair, hands, tools, test equipment, etc. away from all moving or hot engine parts.
- ✓ Operate the vehicle in a well ventilated work area: Exhaust gases are poisonous.
- ✓ Put blocks in front of the drive wheels and never leave the vehicle unattended while running tests.
- ✓ Use extreme caution when working around the ignition coil, distributor cap, ignition wires and spark plugs. These components create hazardous voltages when the engine is running.
- ✓ Put the transmission in PARK (for automatic transmission) or NEUTRAL
- ✓ (for manual transmission) and make sure the parking brake is engaged.
- ✓ Keep a fire extinguisher suitable for gasoline/chemical/electrical fires nearby.
- ✓ Don't connect or disconnect any test equipment while the ignition is on or the engine is running.
- ✓ Keep the tool dry, clean, free from oil/water or grease. Use a mild detergent on a clean cloth to clean the outside of the scan tool, when necessary.

## 1.1 Safety Precautions and Warnings(Before Using CANfilter)

- CANfilter specifically designed for **qualified Automotive Service technician** and **Automotive Accessory Repairing Technician** those have fundamental **knowledge of CAN network** to **diagnosing and fixing CAN bus error** by examine **physical CAN bus Network** in vehicle or **workbench**.
- User must use manufacturer service and scan tool to scan and fix error after conduct diagnosing by CANfilter tool on vehicle.
- Before connect CANfilter, park vehicle in **Park Mode** in safe place in workshop.
- The User must **read Service Manual** or other vehicle related document to identify CAN network in vehicle as well as **CAN high** and **CAN Low** connection wires. Wrong **module,wiring connection, bit rate and bus type** can cause **malfunction** in vehicle .
- Always connect **CAN0** in listen mode to **CAN bus network** of vehicle.



## 2. General Information

Thank you for choosing CANfilter tool. This manual includes the use of equipment notes, please read this manual carefully before use so that you can correctly use it. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form, or by any means, mechanical, electronic, photocopying, recording, or otherwise, without the prior written permission. All copyright and trademarks acknowledged. No patent liability is assumed with respect to the use of the information contained herein. Moreover, because we are constantly striving to improve its high-quality products, the information contained in this manual is subject to change without notice. Every precaution has been taken in the preparation of this manual. Nevertheless, we assume no responsibility for errors or omissions. Neither is any liability assumed for damages resulting from the use of the information contained in this publication.

### 2.1 FEATURES AND USAGE

#### Features

- ✓ Four Selectable transceivers (TJA 1055/ TJA 1050) on two CAN channels.
- ✓ Two TJA 1055 fault tolerance transceiver.
- ✓ On click fault tolerance CAN bus creation.
- ✓ Two TJA 1050 High speed transceiver.
- ✓ Filter 200 CAN bus Identifiers.
- ✓ Auto Detect CAN bus bit rate.
- ✓ HID USB interface, No Specific USB driver required
- ✓ Light weight PC software, No powerful PC required.
- ✓ Identify Module related IDs

#### Usage

- ✓ Convert Bus Type from **ISO 11898-2** (\* TJA1050 High speed CAN transceiver ) to **ISO 11898-3** (\* TJA1054/TJA1055 fault-tolerant CAN transceiver)
- ✓ Convert Bus Type from **ISO 11898-3** (\* TJA1054/TJA1055 fault-tolerant CAN transceiver) to **ISO 11898-2** (\* TJA1050 High speed CAN transceiver)
- ✓ Auto Detect Bit rate.
- ✓ **Convert** Bit rate from **33 Kb** to **1000 Kb**.
- ✓ **Convert** Bit rate from **1000 Kb** to **33 Kb**.
- ✓ CAN Ids **filter**

**Note** \* This tool support every ISO 11898-2/3 specification Transceiver

### 3. Hardware Overview



USB Cable

Power Supply

### 3. Hardware Overview Continue.....



### 3.1 Hardware Overview( Specifications )

<b>ITEM</b>	<b>DESCRIPTION</b>
Operating Voltage	-20 to 70 °C ( -4 to 158 °F )
Storage Temperature	-40 to 85 °C ( -40 to 185 °F )
CAN Interface	D-SUB 9 PIN Female
USB Interface	USB 2.0
Power	DC 12 V
Consumption	MAX 1 W
Dimension	128mm 82mm 32mm

## 4. System Requirements

### 4.1 System Requirements(User)

#### *PC/Laptop Minimum Specifications*

	<b>Minimum Specification</b>	<b>Recommended Specification</b>
CPU	Pentium 3/1GHz or above	Pentium 4/1.6GHz or above
Memory(RAM)	512M or above	1G or above
HDD	20G or above	60G or above
Display	800 x 600 or above	1024 x 768 or above
OS	Windows XP(32 Bit)	Win 7/8/10 (32/64 Bit)
Port	USB 2.0	USB 2.0
Microsoft .Net Framework	Version 3.5 SPI or later.	Version 4.5 SPI or later.

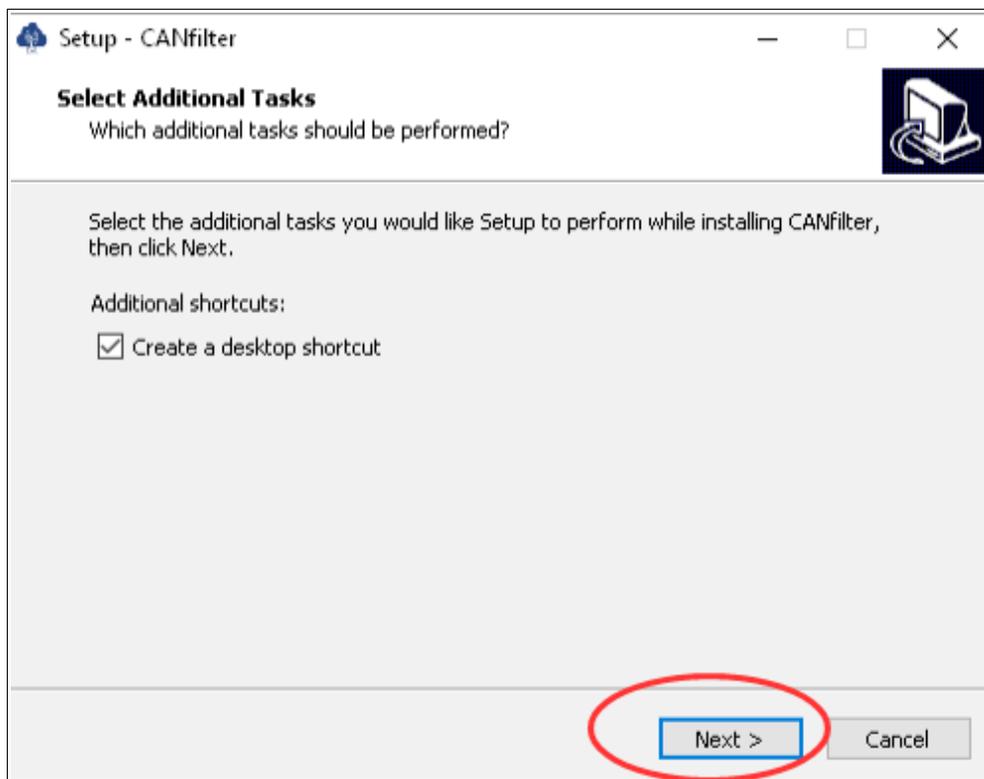
### 4.2 System Requirements(Supplied)

<b>Item</b>	<b>Description</b>
CANfilter Unit	CAN Ids Filter, Bus Converter and Bit rate Converter Tool
USB cable	USB 2.0 B Cable
CAN Interface Connector	D-SUB 9 Pin Male Connector
CD ROM	CANfilter PC App, User Manual

## 5. Software Overview

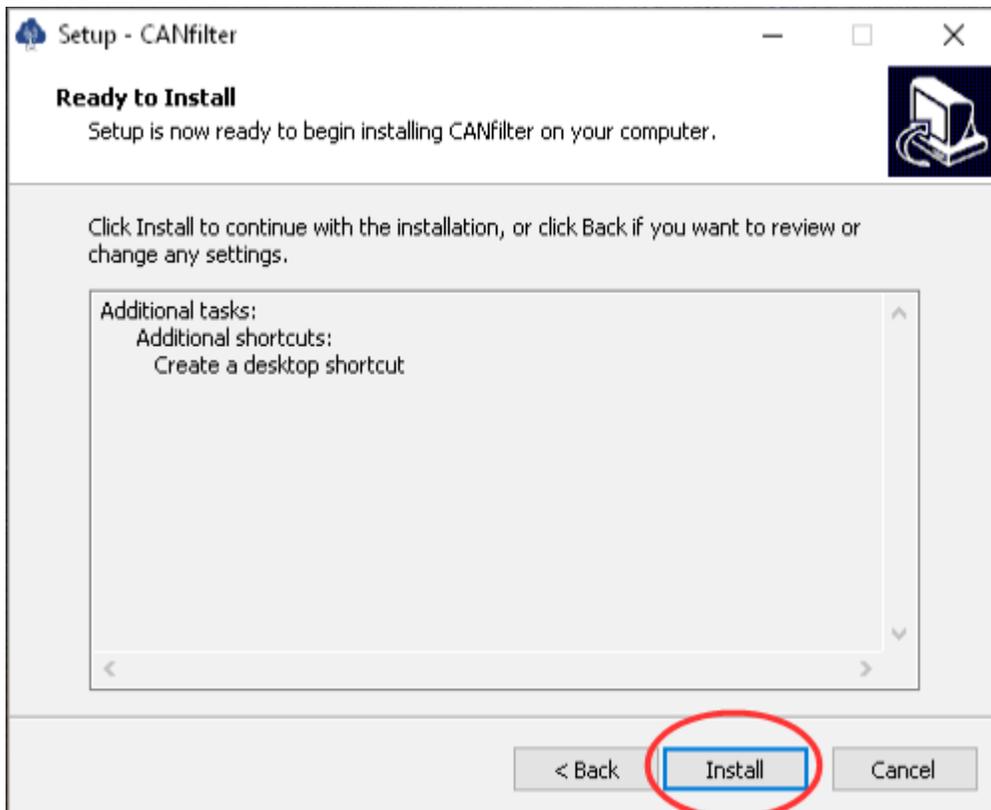
### 5.1 Software Overview( INSTALLATION )

1. Open setup folder from supplied CD ROM
2. Click on CANfilter "Setup.exe" file



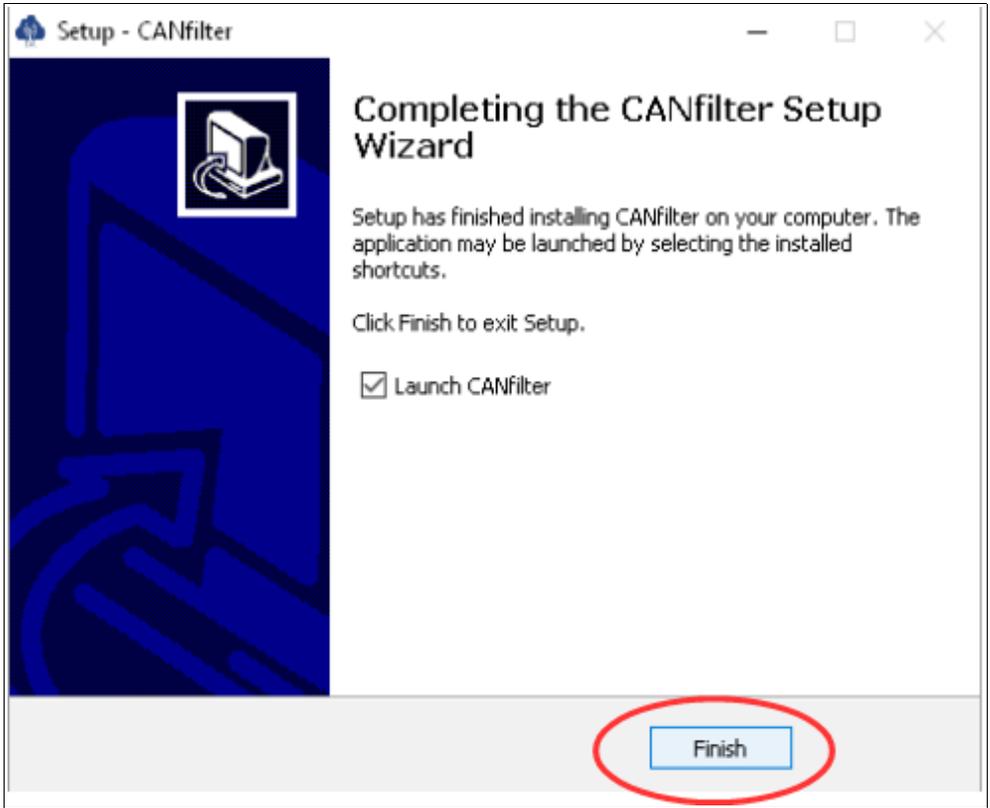
3. Click on "Next"

5. 1 Software Overview( INSTALLATION Continue.....)



4. Click on "Install"

5. 1 Software Overview(INSTALLATION Continue.....)



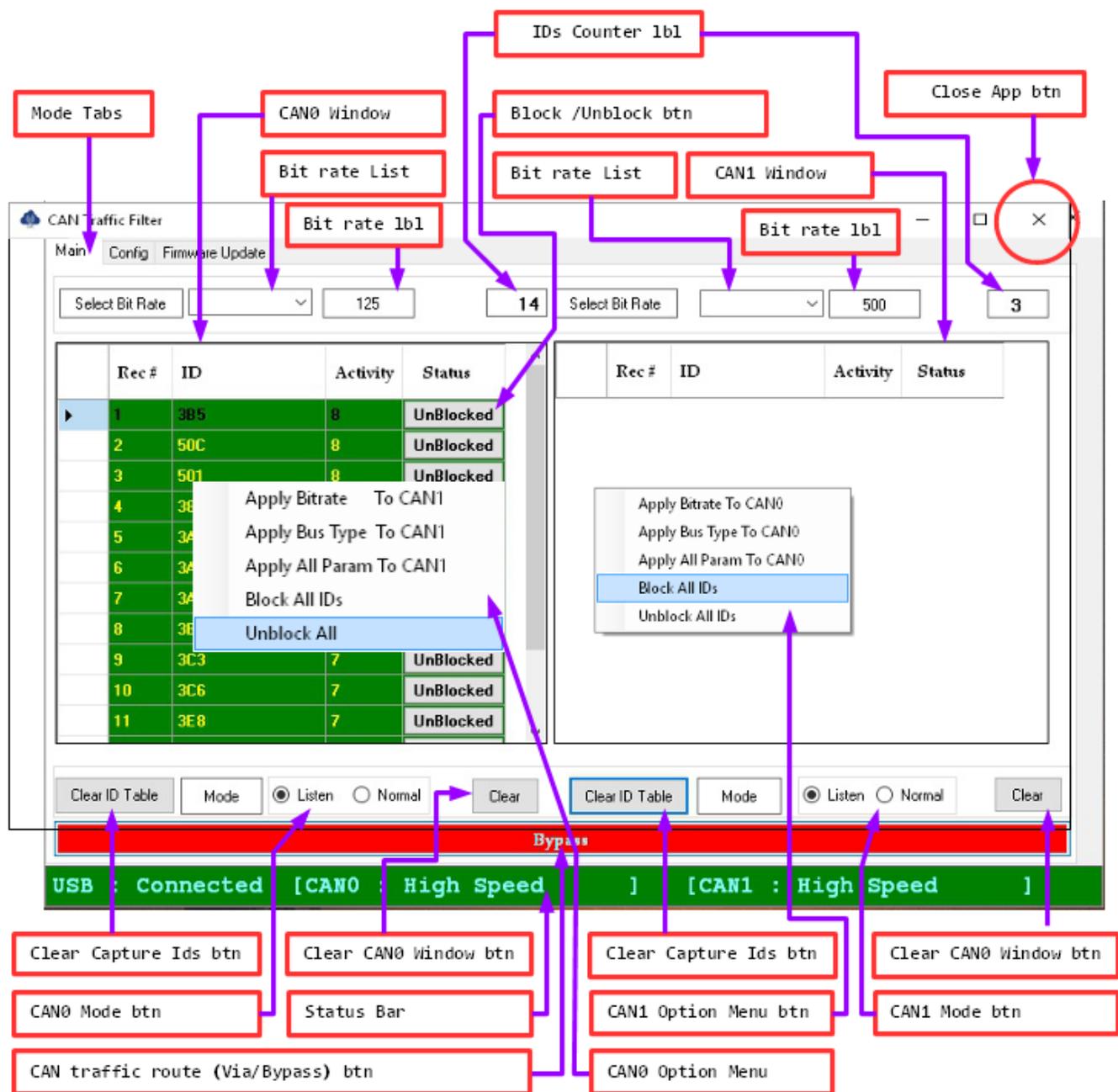
5. Click on “Finish” to close set and run Application.

## 5.2 Software Overview(Intro to PC app.)

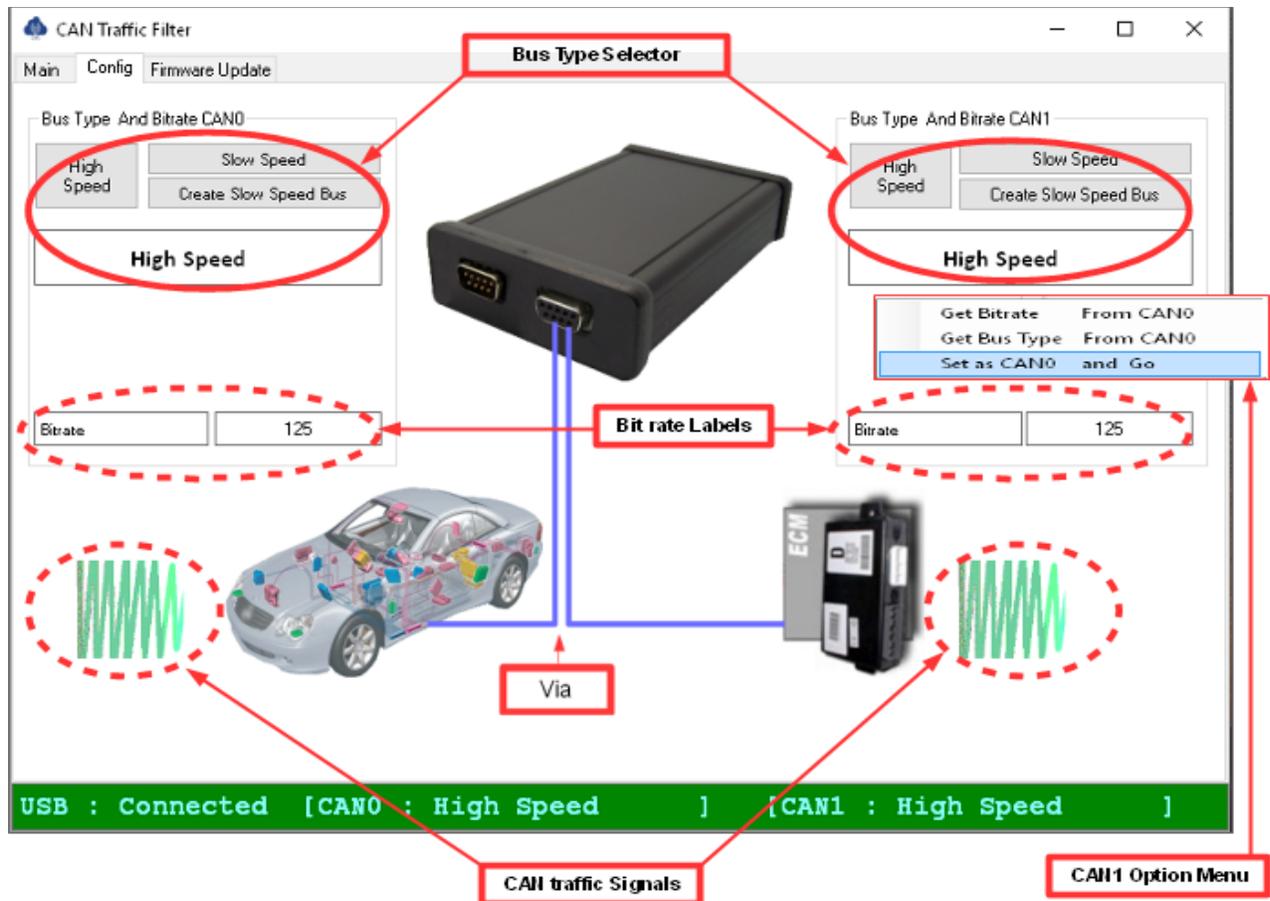
The CANfilter PC application software facilitate the user to apply filter on CAN traffic going through CAN channels, configure, and update CANfilter tool. There are three tabs;

- Main tab use to control the CAN traffic by block or unblock CAN Ids. The User can easily configure CAN channels by select appropriate Bit rate and CAN modes.
- Config tab use to select appropriate Bus Type for CAN channels. The Config tab is select automatically on application loading time.
- Update tab use to update firmware updating.

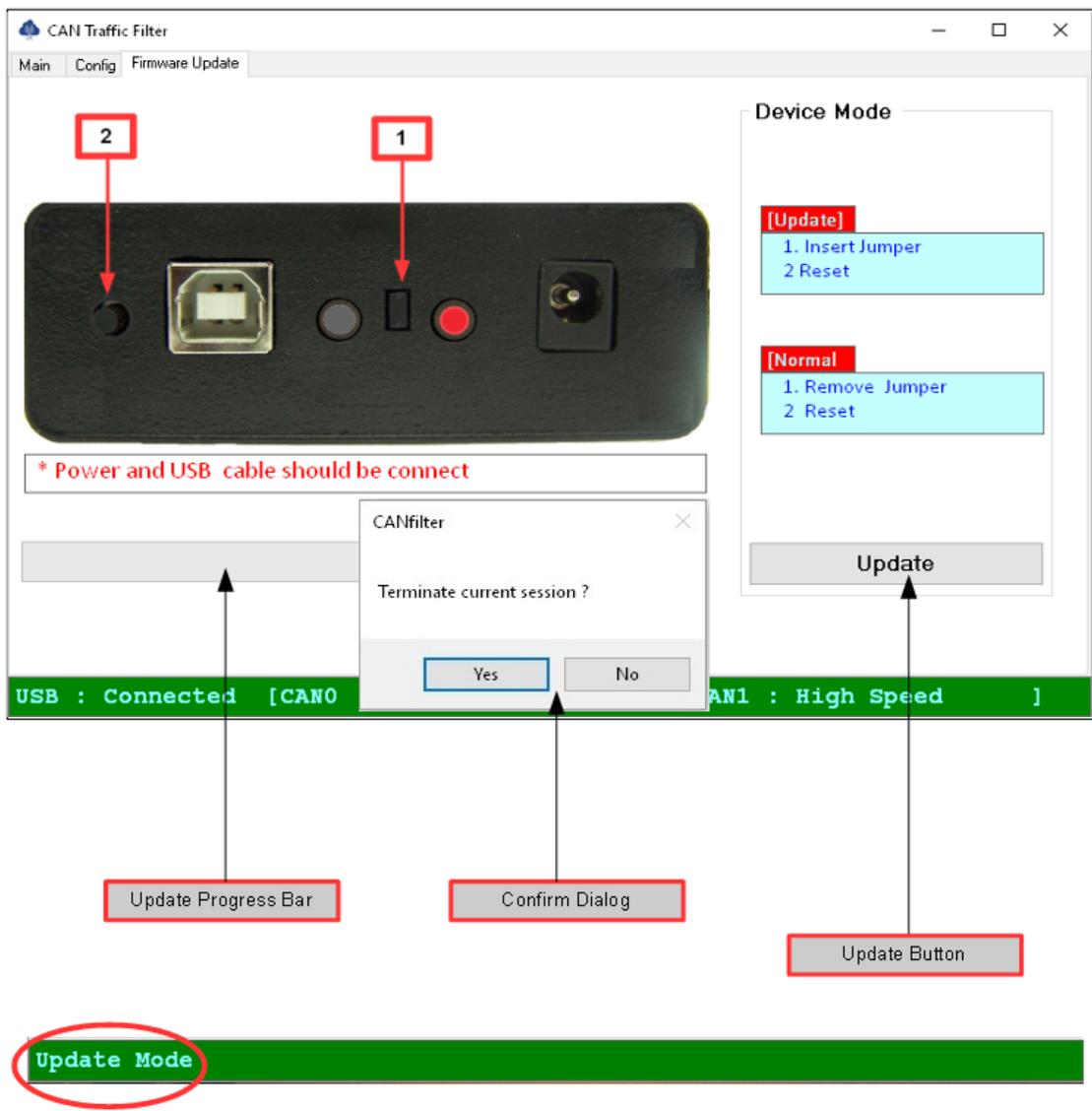
## 5. 2.1 Software Overview( Intro to PC App -Main Tab )



## 5. 2.2 Software Overview( Intro to PC App -Config Tab )



## 5. 2.3 Software Overview( Intro to PC App -Update Tab )



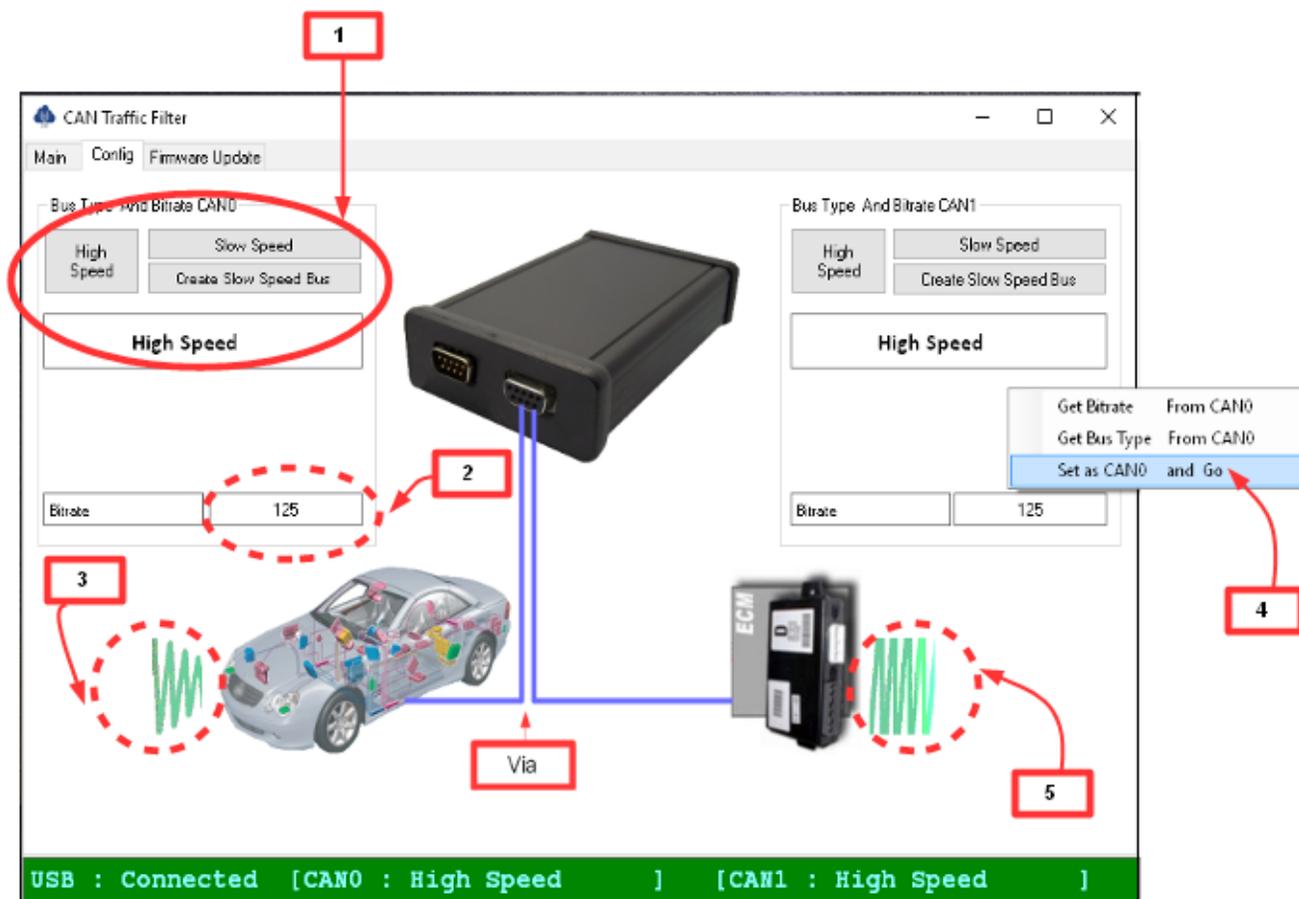
## 6. Functions

### *Default Configuration of CAN Channels*

	<b>CAN0</b>	<b>CAN1</b>
<b>Designation</b>	Source CAN	Destination CAN
<b>Bus type</b>	High Speed	High Speed
<b>Bit rate</b>	Auto bit rate	500 Kb
<b>Mode</b>	Listen	Listen

## 6.1 Function (Router)

1. Select Bus type same as connected CAN network.
2. Automatically detect and set bit rate if appropriate bus type is selected.
3. CAN0 traffic signal Appears if CAN frames receive by the CANfilter.
4. Right click on Bus type and Bit rate CAN1 and select last option “Set as CAN0 and Go”
5. CAN1 traffic signal Appears if CAN frames receive by the CANfilter.



## 6.2 Function (Bus Type Converter)

CANfilter support two CAN channels. Each channel can be configure as Fault Tolerance(Slow Speed) or high speed Bus type. This facility allow user to convert Bus type between two CAN channels. By default these channels configured as high speed bus type.

The image displays two screenshots of the CAN Traffic Filter software interface. The top screenshot shows the configuration screen with two CAN channels. The left channel (CAN0) is set to High Speed, and the right channel (CAN1) is set to Slow Speed. A central diagram shows a USB device connected to a car (CAN0) and an ECU (CAN1). A 'Bypass' button is located between the car and ECU. A context menu is open over the CAN1 configuration, showing options: 'Get Btrate From CAN0', 'Get Bus Type From CAN0', and 'Set as CAN0 and Go'. The status bar at the bottom indicates 'USB : Connected [CAN0 : High Speed] [CAN1 : Slow Speed]'. The bottom screenshot shows the data capture interface with two tables of recorded data. The left table shows 11 records for CAN0, and the right table shows 3 records for CAN1. The status bar at the bottom indicates 'USB : Connected [CAN0 : High Speed] [CAN1 : Slow Speed]'. A 'Vis' button is highlighted in the bottom screenshot.

**Figure 1: CAN Traffic Filter Configuration and Data Capture**

**Top Screenshot: Configuration**

- 1: High Speed button (CAN0)
- 2: Btrate 125 (CAN0)
- 3: Car icon (CAN0)
- 4: Slow Speed button (CAN1)
- 5: Status bar: [CAN1 : Slow Speed]
- 6: Main menu button
- 7: Vis button
- 8: Clear ID Table button
- 9: Select Bt Rate 125 (CAN1)
- 10: Normal mode button
- 11: ECU icon (CAN1)

**Bottom Screenshot: Data Capture**

**Table 1: CAN0 Data**

Rec #	ID	Activity	Status
1	50C	32	UnBlocked
2	3E0	32	UnBlocked
3	3F1	32	UnBlocked
4	5011	44	UnBlocked
5	3B5	44	UnBlocked
6	3A0	44	UnBlocked
7	3A5	44	UnBlocked
8	3A8	43	UnBlocked
9	3B1	43	UnBlocked
10	3B5	44	UnBlocked
11	3C3	43	UnBlocked

**Table 2: CAN1 Data**

Rec #	ID	Activity	Status
1	50C	18	UnBlocked
2	3E8	10	UnBlocked
3	3F1	11	UnBlocked

## 6.2 Function (Bus Type Converter Continue.....)

### Procedure to Convert Bus Type

1. Select Source(CAN0) bus type default is High Speed.
2. Wait for Select Bit rate by the tool automatically.
3. Wait for CAN traffic signal.
4. Select Destination(CAN1) Bus Type.
5. Check for Applied bus type.
6. Click in Main tab.
7. Click On Via/Bypass toggle button for select Via.
8. Click on Click ID table button to clear CAN1 buffer.
9. Select appropriate bit rate for destination CAN(CAN1) bus.
10. Select Mode as "Normal".
11. Click on config page and check CAN traffic signal on Destination CAN(CAN0).

Example :-

#### **Scenario # 1**

Analyze **fault-tolerant CAN network** by a **high speed** supported CAN analyzer.

#### **Scenario # 2**

Receive CAN frame **from High speed network** and send **to fault-tolerant CAN network** .

#### **Scenario # 3**

Analyze CAN frames sending by isolated **fault-tolerant CAN network** supported radio.

Scenario #	Bus Type	Source Channel	Config Code	Required bus Type	Destination Channel	Config Code
1	Fault-tolerant	CAN0	2	High Speed	CAN1	1
2	High Speed	CAN0	1	Fault-tolerant	CAN1	2
3	Fault-tolerant	CAN0	2	Fault-tolerant Bus network	CAN1	3

### **Config Code Table**

BUS	Config Code
High Speed	1
Slow Speed	2
Slow Speed + Bus	3

Note : [Slow Speed + Bus] configuration use to create **fault-tolerant type bus** to connect s tand alone **fault-tolerant type bus supported** CAN module.

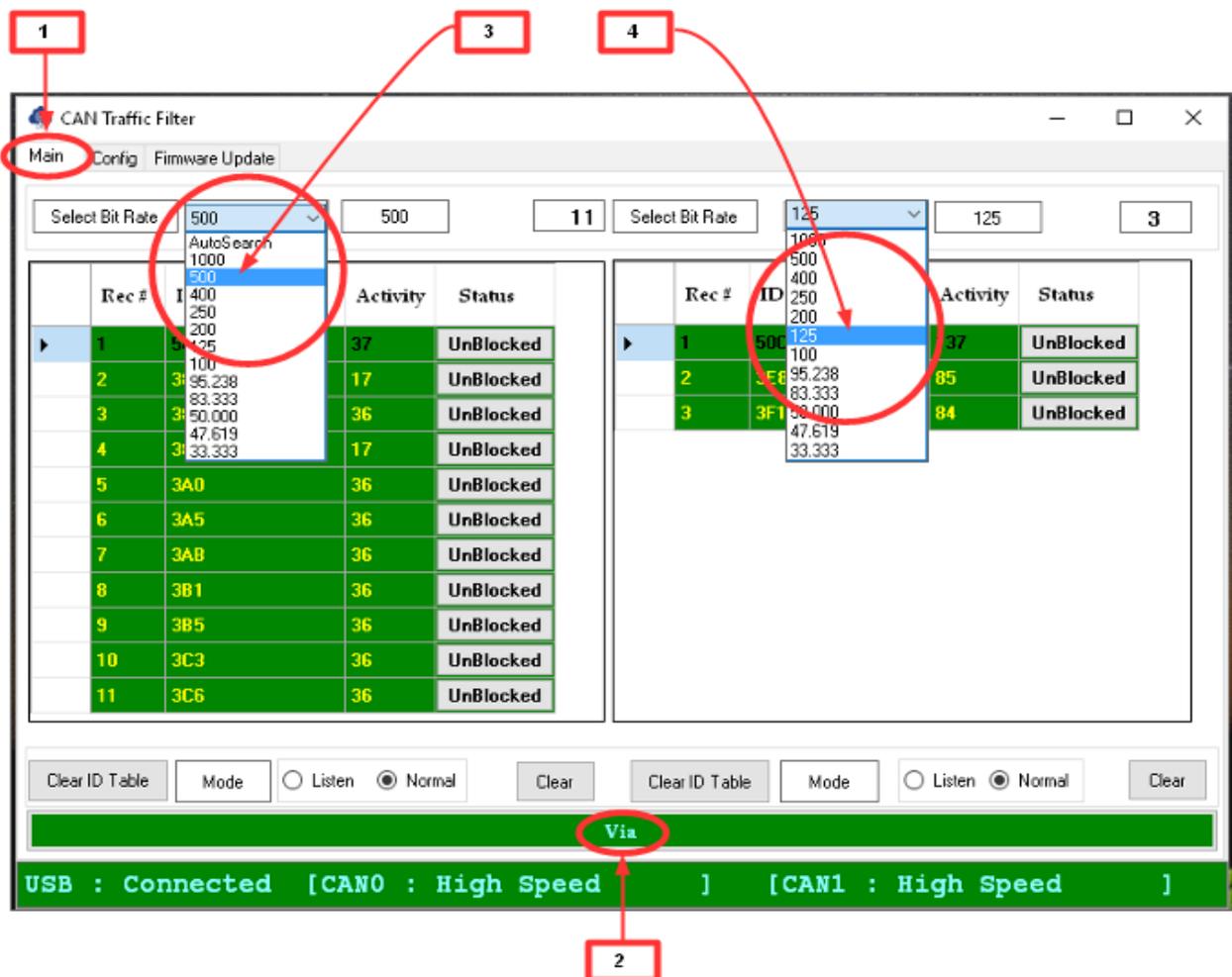
## 6.3 Function (Bit rate Converter)

CANfilter can convert bit rate from given bit rate at CAN0 into desired bit rate at CAN1 CAN bus.

By default CAN0 and CAN1 bit rate configured as followed:

	CAN0	CAN1
Bit rate	Auto bit rate	500 Kb

As Bit rate converter both CAN channel can be configure at desired bit rate from 33.33 Kb to 1000 Kb or vice-versa.



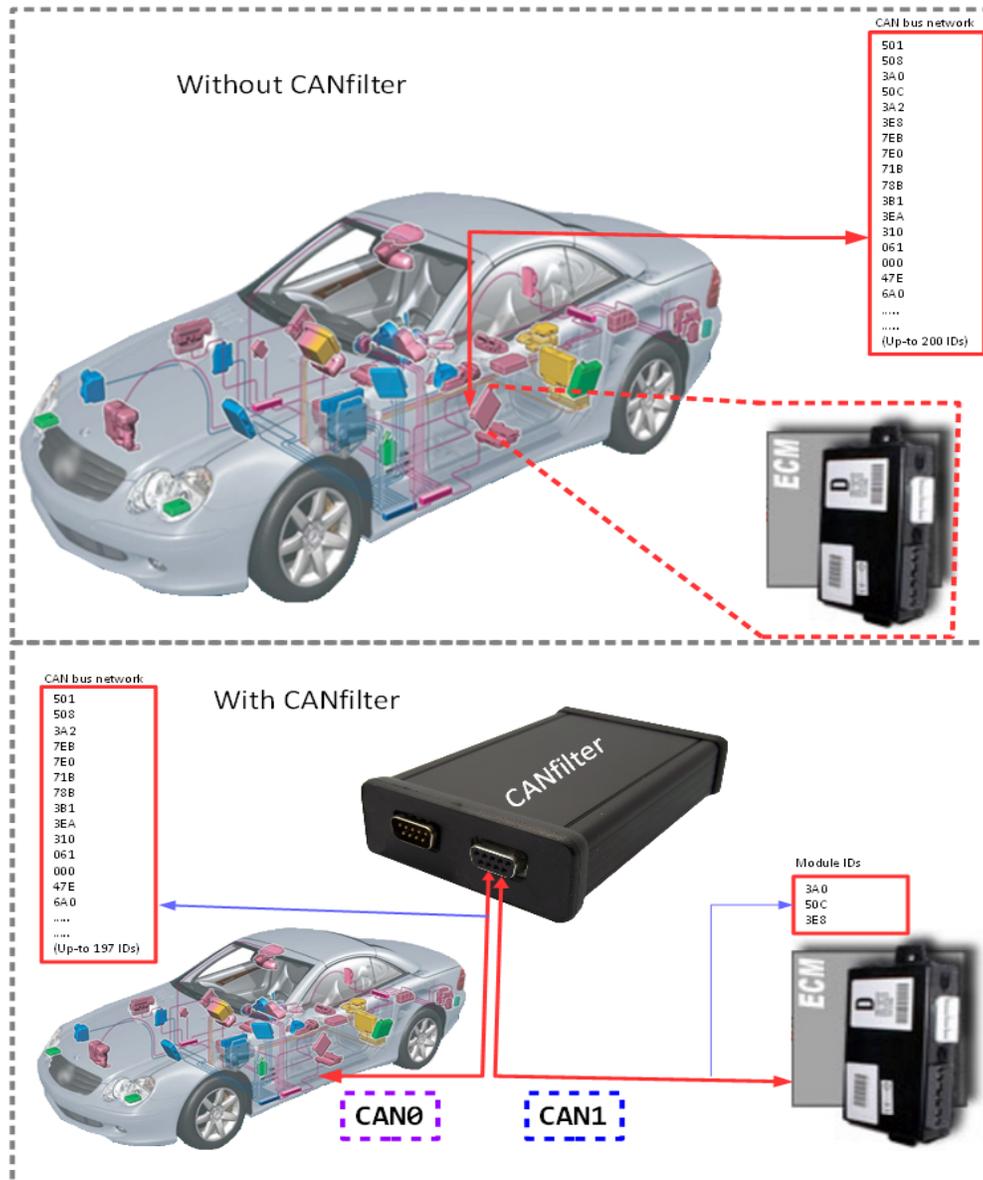
### Procedure to Convert Bit rate

1. Click on Main tab.
2. Select "CAN Traffic Route" toggle button as Via.
3. Select desired bit rate from CAN0 bit rate list.
4. Select desired bit rate from CAN1 bit rate list.

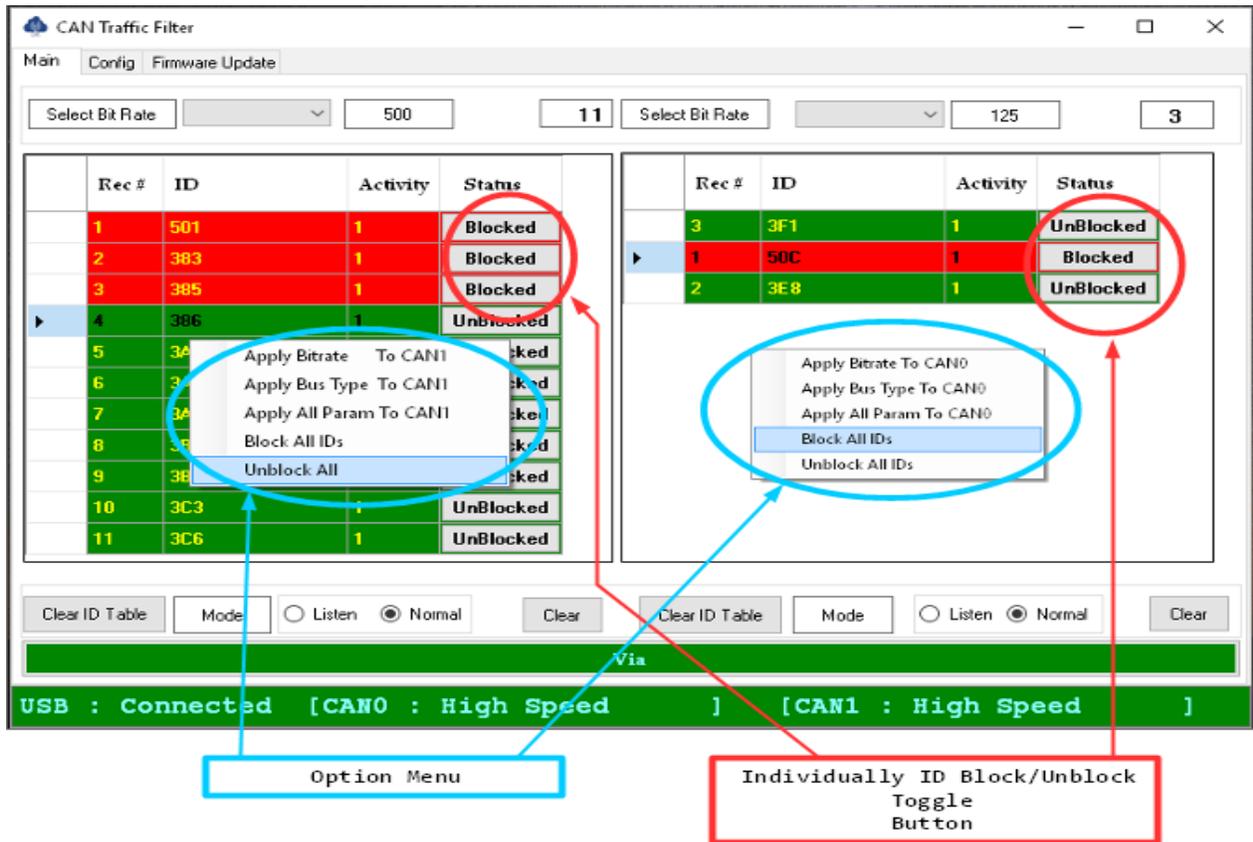
## 6.4 Function (CAN traffic Filter)

CAN traffic filter is the main feature of CANfilter automotive tool which make it unique automotive tool to help physically analyze CAN Bus network. Physical CAN bus analysis is use full in the situation when ordinary scan tool unable to detect a specific faulty module on a CAN bus network.

A CAN bus network may have hundreds of CAN frames. It is very hard to determine specific CAN frame of group of CAN frame from the CAN traffic relating to a module being analysis. To overcome this problem CANfilter to can be place between The module and rest of CAN bus network.



## 6.4 Function (CAN traffic Filter Continue...)

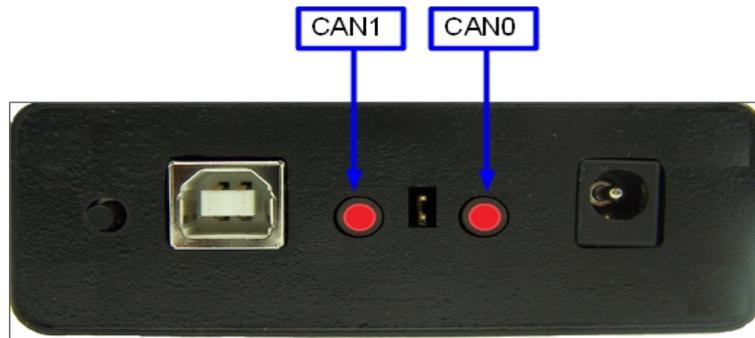


### Procedure to filter CAN traffic

1. Set CANfilter as router as direct in 6.1
2. Click on Main Tab.
3. Click on Block/Unblock toggle button to perform desired operation on ID(s) in CAN0 or CAN1 window.

**Note:** Both CAN channels configure as “normal mode” and Via/bypass toggle switch select as “Via” to apply filter.

## 7. CAN Channels Activities



State		CAN0	CAN1
Initialize		Red Blinking	Red Blinking
CAN0 Rx		Green Blinking	
CAN0 Rx	CAN1 Rx	Green Blinking	Green Blinking
CAN0 RxTx	CAN1 Rx	Green Blinking + Red Blinking	Green Blinking
CAN0 RxTx	CAN1 RxTx	Green Blinking + Red Blinking	Green Blinking + Red Blinking
	CAN1 Rx		Green Blinking
CAN0 Rx	CAN1 Rx	Green Blinking	Green Blinking
CAN0 Rx	CAN1 RxTx	Green Blinking	Green Blinking+ Red Blinking
CAN0 RxTx	CAN1 RxTx	Green Blinking + Red Blinking	Green Blinking + Red Blinking

**Rx** = Receiving CAN frames from CAN network

**Tx** = Sending CAN frames to CAN network

**RxTx** = Receiving and Sending CAN frame from/To CAN network