



Manual

CANcardXL CANcardXLe

Version 5.0

English

Imprint

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1 Introduction

In this chapter you find the following information:

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1.1 About this User Manual

To find information quickly








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bold	Blocks, surface elements, window- and dialog names of the software. Accentuation of warnings and advices. [OK] Push buttons in brackets File Save Notation for menus and menu entries
Microsoft	Legally protected proper names and side notes.
Source Code	File name and source code.
Hyperlink	Hyperlinks and references.
<CTRL>+<S>	Notation for shortcuts.

Symbol	Utilization
	Here you can obtain supplemental information.
	This symbol calls your attention to warnings.
	Here you can find additional information.
	Here is an example that has been prepared for you.
	Step-by-step instructions provide assistance at these points.
	Instructions on editing files are found at these points.
	This symbol warns you not to edit the specified file.

1.1.1 Certification

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2 CANcardXL and CANcardXLe

In this chapter you find the following information:

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	CANcardXLe	

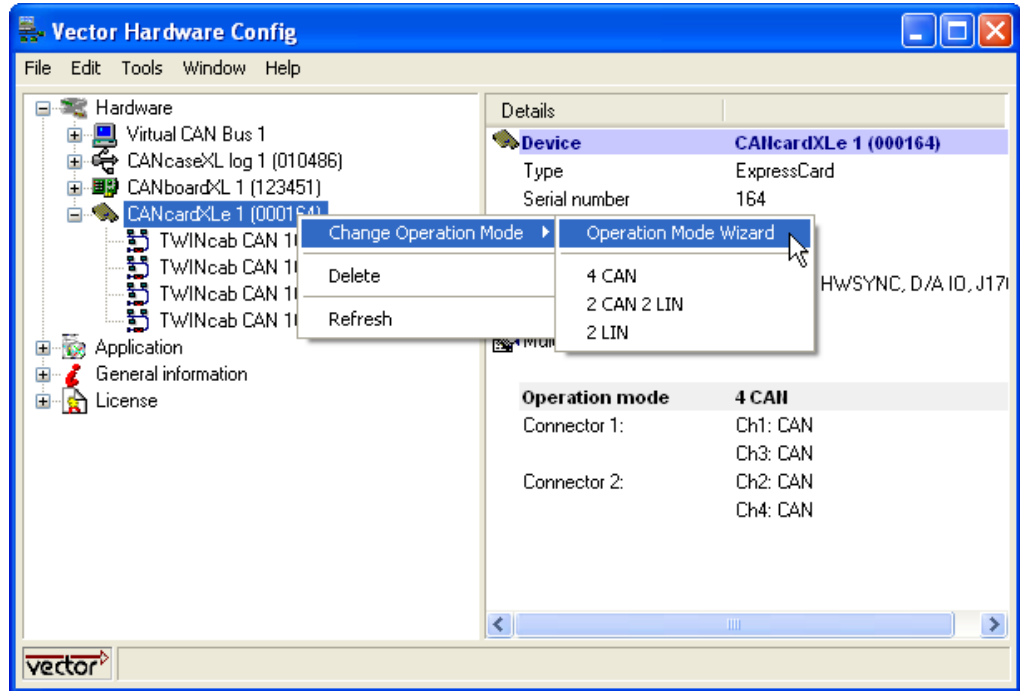
2.1 Introduction

- CANcardXL** The CANcardXL is a PC card according to the PC-Card-standard (PCMCIA) with the powerful 32 bit 64 MHz microcontroller from ATMEL with ARM7 Core and two SJA1000 CAN controllers from Philips. The SJA1000 handles CAN messages with 11 bit as well as 29 bit identifiers. The reception and analysis of remote frames is possible without restrictions. The CANcardXL is able to detect and to generate error frames on the bus. It may also be inserted in any free PC-Card (PCMCIA) slot that is capable of accommodating Type II or Type III cards. The PC power does not have to be switched off before inserting or removing the card.
- CANcardXLe** The CANcardXLe uses a certified and Vector specific FPGA CAN Core and has an ExpressCard|54 interface. Up to four independent channels are available with two TWINcabs (see accessories manual on the driver CD).
- Configuration** The CANcardXL/XLe can be configured with the **Vector Hardware Config** tool (**Windows | Start | Settings | Control Panel | Vector Hardware**). Further details about the tool can be found in the separate installation instructions at the end of this manual.
- Bus types** In order to connect the CANcardXL/XLe to a specific bus type, a number of CAN/LIN transceivers and DAIO transceivers are available which are integrated into the connection cables (Cabs). See the accessories manual for further details on the driver CD: `\Documentation\Accessories_for_Network_Interfaces.pdf`

2.2 Channel Configuration

- CANcardXLe** The bus types on the CANcardXL (max. two channels) are selected by specific CANcabs or LINCabs. The CANcardXLe (max. four channels) requires a previous selection of the operation mode. The following modes are available:
- **CAN**
Full-featured CAN channel for sending and receiving.
This type is also suitable for D/A IO and J1708.
 - **LIN**
Full-featured LIN channel for sending and receiving.
- The mode is chosen with the **Vector Hardware Configuration** tool (**Start | Settings | Control Panel | Vector Hardware**) by right-clicking a CANcardXLe item, followed by **Change Operation Mode**.

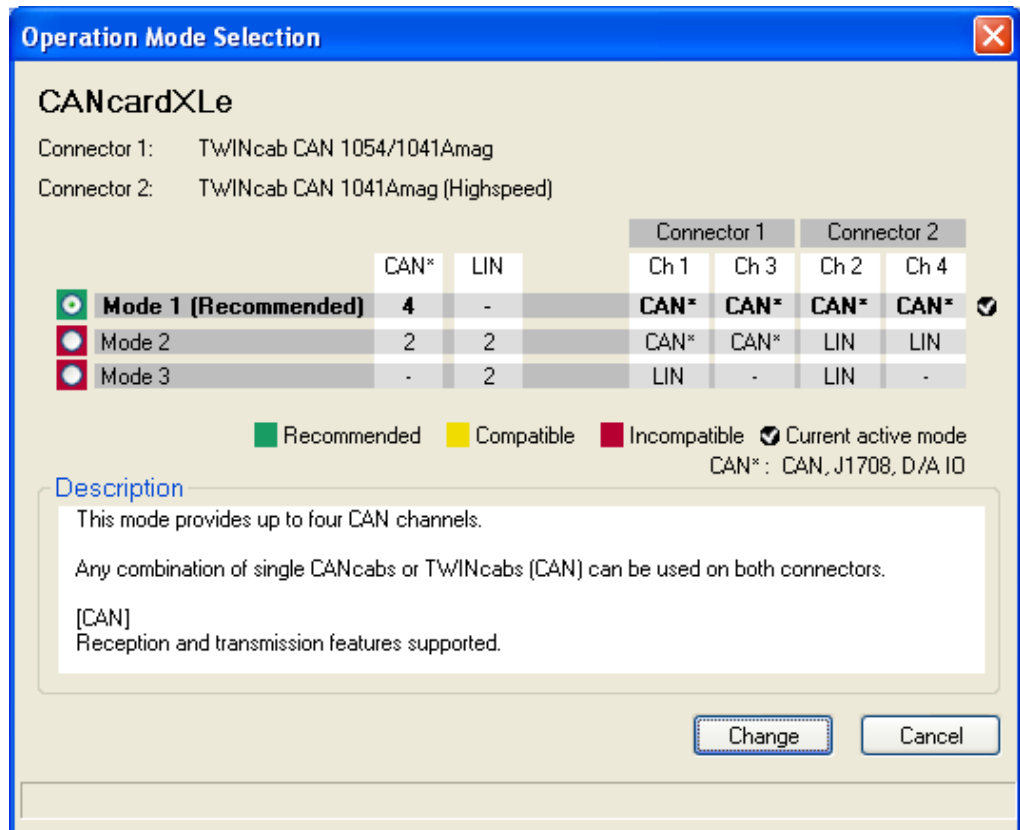
CANcardXLe:
Changing the operation mode



Change Operation Mode context menu

In the context menu, one of the operation modes can be chosen. Alternatively, the **Operation Mode Wizard** can be selected which provides an overview over several channel configurations.

Operation Mode Wizard



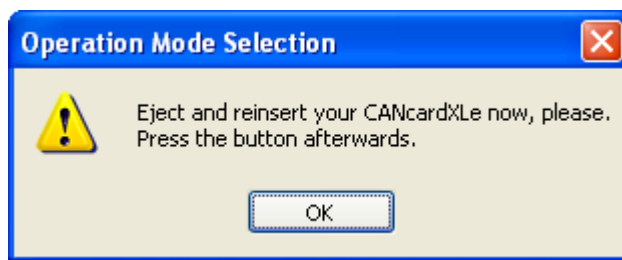
Depending on the used CAN-/LIN- or TWINcabs with the CANcardXLe, the dialog marks the mode compatibility:

- **Recommended**
This mode is the best choice for the connected Cabs.
- **Compatible**
This mode is only suitable to a limited extent for the connected Cabs. Some channels may not be available (e. g. due to a connected single CANcab which has not a second physical channel).
- **Incompatible**
This mode is incompatible for the connected Cabs (e. g. by choosing a 4x-CAN configuration, but having two TWINcabs for LIN connected).

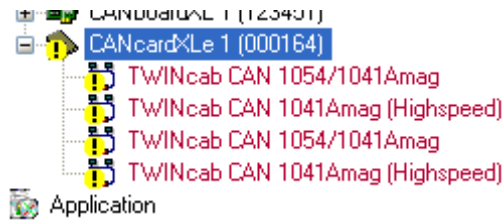
The selected mode can be activated by pressing the button **[Change]**.



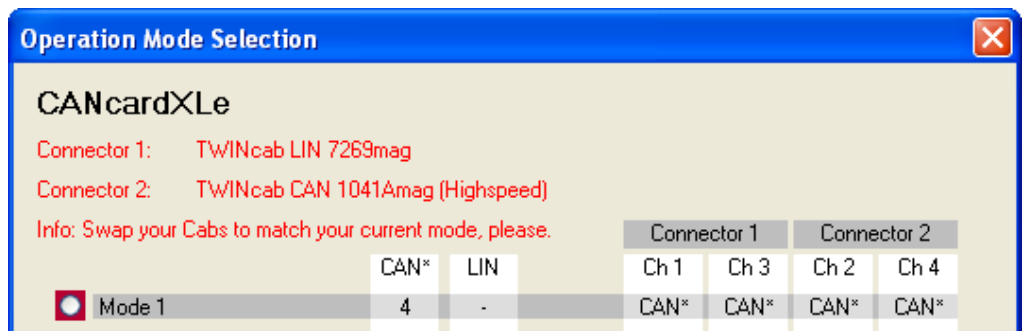
Info: Please follow the warning message after a mode has been changed. The CANcardXLe has to be ejected and reinserted again to run the new mode. Close the warning message afterwards.



Info: Please take care of correctly connected and compatible Cabs. Any incompatibility is marked with a yellow icon.



If two Cabs are being used, but incorrectly connected for the selected mode, the **Option Mode Wizard** displays a notification for swapping.



2.3 Synchronization

General information Time stamps, which are created during a measurement by two or more devices of the Vector interface family, can be synchronized by software or hardware.

2.3.1 Software Sync

Synchronization by software The software synchronization is driver-based and available for all applications without any restrictions. This kind of synchronization can be switched on in **Vector Hardware Config | General information | Settings | Software time synchronization**.

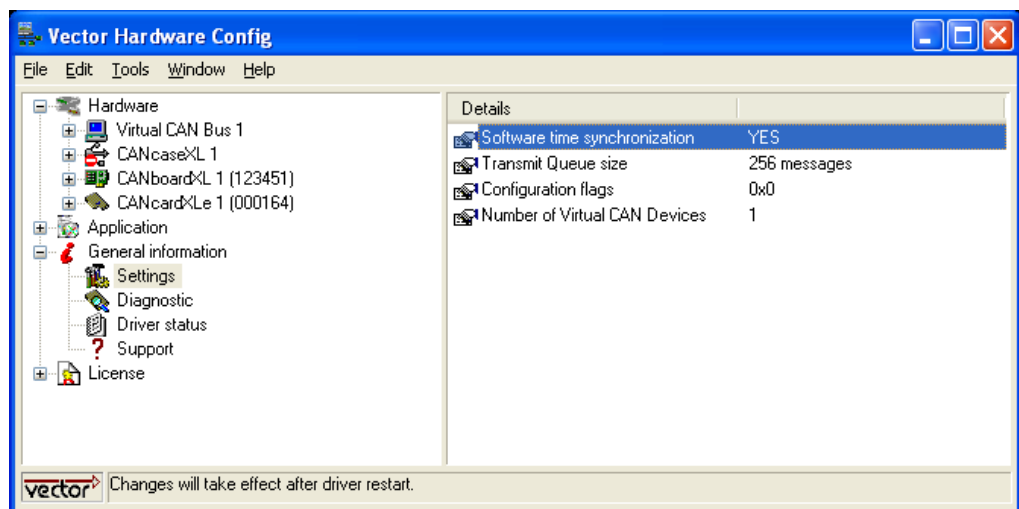


Figure 1: Switching on the software synchronization.

The accuracy of the time stamp correction depends on the device and is typically 50 μ s.

2.3.2 Hardware Sync

Synchronization by hardware

A more precise synchronization of multiple devices is possible via the hardware synchronization. The hardware synchronization with a maximum of four devices is done with the SYNCcableXL (see accessories manual, article number 05018) and has to be supported by the application. The accuracy of the time stamp correction depends on the application and is typically 1 μ s.



Info: To connect a SYNCcableXL to the CANcardXL/XLe a SyncBox XL (see accessories manual, article number 22013) is required.

Functionality of the hardware synchronization

The devices to be synchronized must be interconnected by a two-wire bus (signals: SYNC and GND). The devices have a 3-pin connector for this use case (Binder type 712).

Pin	Assignment
1	Not connected
2	Synchronization line
3	Ground



At each high-low edge of the sync line the CANcardXL/XLe generates a time stamp that is provided to the application. This allows the application to synchronize the time stamps of different devices to a common time base.

The synchronization edges can be generated by the VN or the XL interface family.



Note: The hardware synchronization must be supported by the application. For further information please refer to the relevant manual. Please note that the software synchronization must be disabled (see **Vector Hardware Config | General information | Settings | Software time synchronization**) if the hardware synchronization is used.

2.4 Technical Data

2.4.1 CANcardXL

Area of application	Mobile, stationary
Microcontroller	ATMEL AT91 (ARM7 TDMI with 64 MHz)
CAN channels	Two independent channels (NXP SJA1000)
Identifier	11/29 bit
Transceiver (magnetical decoupling)	See CAN-/LINcab in bus transceiver overview Support of IOcab 8444opto
PC interface	PCMCIA Type II - 16 bit
Hardware time synchronization	With SyncBox XL and SYNCcableXL
Temperature range	Operation: -20..+65 °C Storage: -40..+85 °C
Driver libraries for	C++, C, .NET (C#, Visual Basic, Delphi)
Operating system	Windows XP (SP3) Windows Vista (SP1) Windows 7 (32 bit / 64 bit)
Error Frame/Remote Frame	Detection & Generation
Max. baud rate	1 Mbit/sec
Dimensions approx.	85 x 54 x 5 mm
Power consumption (typ.)	1 W
Time stamp accuracy	1 µs
Average response time	100 µs

2.4.2 CANcardXLe

Area of application	Mobile, stationary
Microcontroller	ATMEL AT91R40008 32bit 64 MHz
CAN channels	Up to four independent channels, according to the Cab; sending and receiving 100% bus load; certified Vector CAN controller (FPGA)
LIN channels	Up to two independent channels, according to the Cab; sending and receiving 100% bus load; Conformance tests of LIN2.1 specification (CANoe/CANalyzer V7.1 SP5 or higher); Restricted four channel support planned.
Identifier	11/29 bit
Transceiver (magetical decoupling)	Support of all CAN/LINcabs and of the new TWINcabs (see bus transceiver overview)
PC interface	ExpressCard 54 (PCI Express 1x); From driver version V6.8 on and only with the Vector ExpressCard Drive the CANcardXLe can also be used in Desktop PCs.
Hardware time synchronization	With SyncBox XL and SYNCcableXL
Temperature range	Operation: 0..+55 °C Transport and storage: -40..+85 °C
Driver libraries for	C++, C, .NET (C#, Visual Basic, Delphi)
Operating system	Windows XP (SP3) Windows Vista (SP1) Windows 7 (32 bit / 64 bit)
Error Frame/Remote Frame	Detection & Generation
Max. baud rate	1 Mbit/sec
Dimensions approx.	ExpressCard 54 (75mm x 54mm, 26 Pin)
Power consumption (typ.)	1.9 W
Time stamp accuracy	1 µs
Average response time	≤ 100 µs



Caution: ExpressCards have a restricted hot-plug capability by BIOS. Please refer to the Application Note **AN-INI-1-004** at www.vector-worldwide.com/appnotes for further details.

3 CANcardXL/XLe Accessories

In this chapter you find the following information:

3.1 Accessories

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3.1 Accessories



Reference: Further information about the available accessories can be found in the separate accessories manual on the driver CD:
`\Documentation\Accessories_for_Network_Interfaces.pdf`

4 Appendix A: Addresses

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Vector Korea IT Inc.	<p>Vector Korea IT Inc. #1406 Mario Tower 222-12 Guro-dong, Guro-gu Seoul, 152-848 Republic of Korea</p> <p>Support: : +82 2 807 0600 Ext.2 Phone: +82 2 807 0600 Fax: +82 2 8070601</p> <p>mailto:info@kr.vector.com http://www.vector.com</p>

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<http://www.vector.com>

Manual

Installation Instructions

Version 3.0

English

Imprint

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1 Introduction

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2 Driver Installation

In this chapter you find the following information:

2.1	Minimum Requirements	page 8
2.3	Vector Driver Setup	page 9
2.4	Vector Hardware Configuration	page 11

2.1 Minimum Requirements

Hardware	CPU	Pentium 4 or higher
	Memory	512 MB or more
Network interface	CANcardXL	: PCMCIA
	CANcardXLe	: ExpressCard 54
	CANboardXL PCI	: PCI
	CANboardXL PCIe	: PCI Express 1x
	CANboardXL PXI	: Compact PCI/PXI
	CANcaseXL	: USB
	CANcaseXL log	: USB
	VN1610	: USB
	VN1611	: USB
	VN1630	: USB
	VN2610	: USB
	VN2640	: USB
	VN3300	: PCI
	VN3600	: USB
VN7600	: USB	
VN8910	: USB	
Software	Operating system	Windows XP SP3 (32 bit) Windows Vista SP1 (32 bit) Windows 7 (32/64 bit)
	Driver version	8.x
	Measurement application	The devices can be run with several applications from Vector (e. g. CANoe, CANalyzer) or with measurement applications from other companies. Therefor the devices require a related license. Applications based on the Vector XL Driver Library can be run without a license.

2.2 Hints



Note: Many desktop PCs have power managers which block the CPU for a specific time. This impairs accuracy of the time system. If your application has stringent timing requirements (e. g. time-driven sending of messages or time-driven evaluations), you have to deactivate these power managers. Power management settings may be contained in the BIOS setup or on the Control Panel of **Windows XP / Vista / Windows 7** (e. g. Power options).

No further mention will be made of the power manager in this document.



Info: Please note that you will need **Administrator Rights** for the following steps.

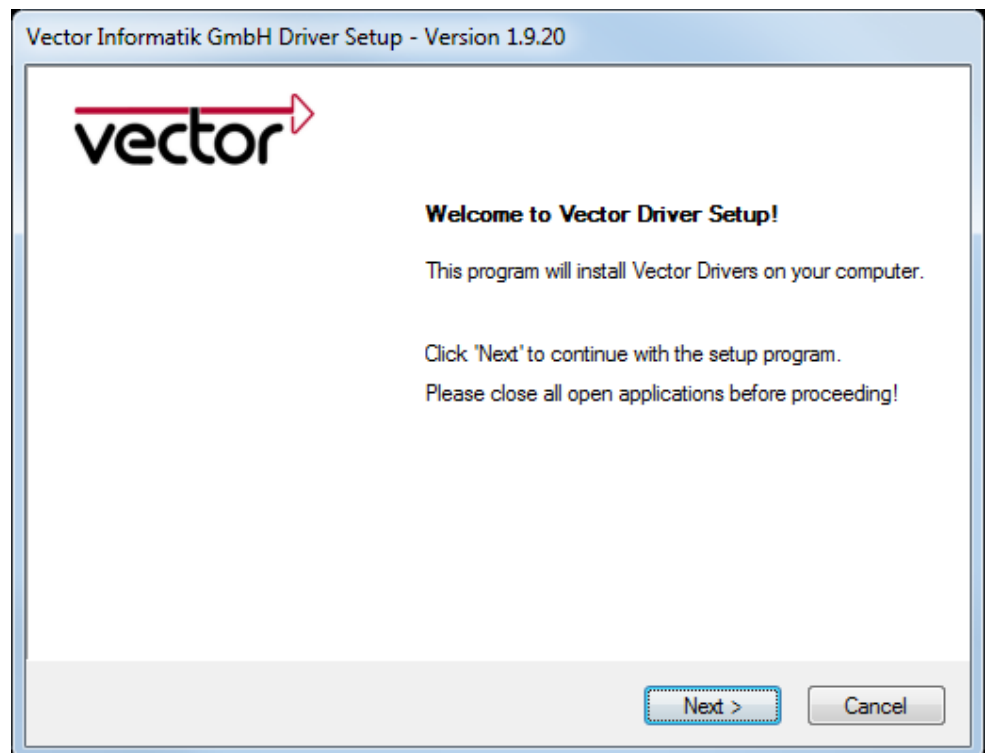
2.3 Vector Driver Setup

General information The Vector Driver Disk offers a driver setup which allows the installation or the removal of Vector devices.



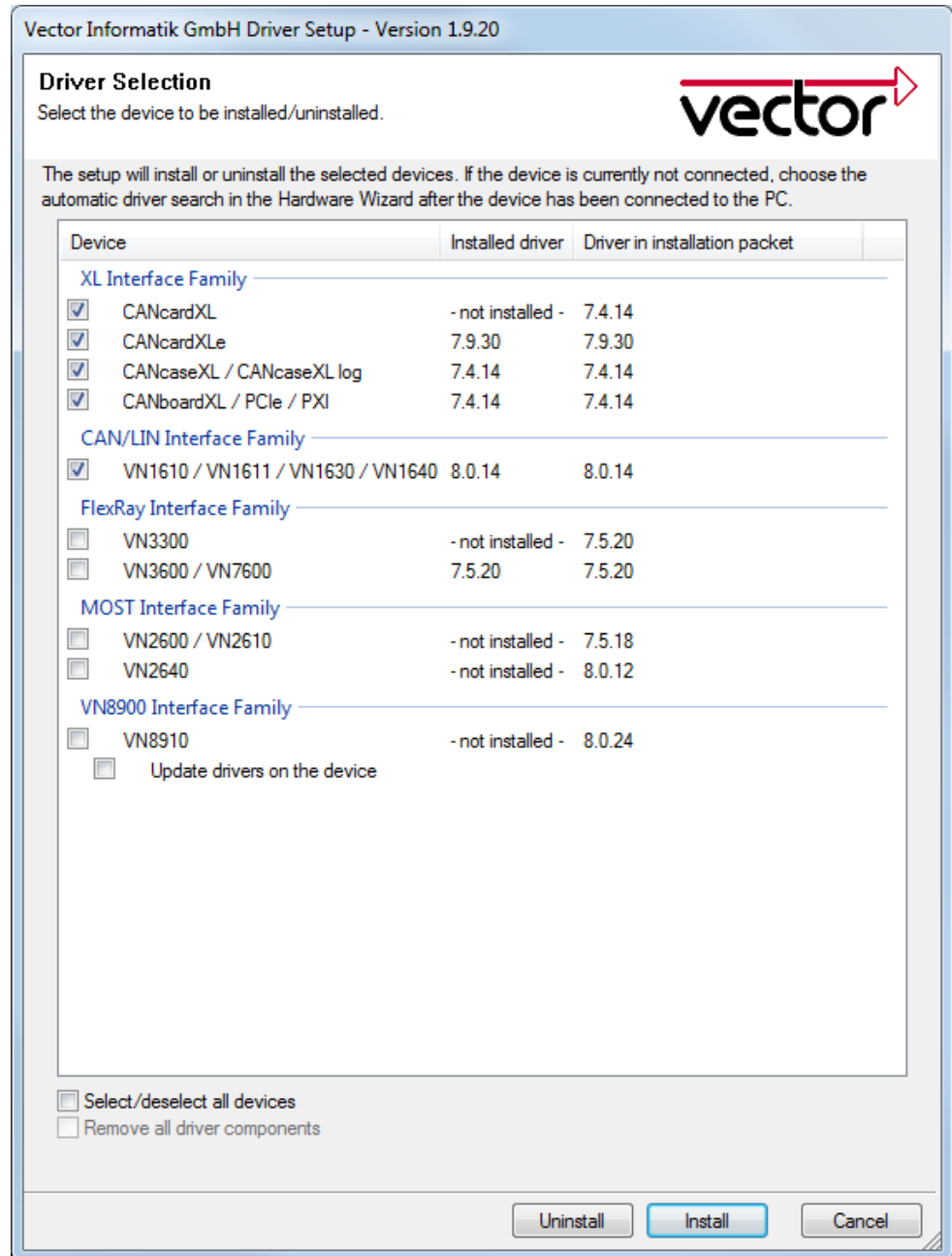
1. Execute the driver setup from the autostart menu or directly from `\Drivers\Setup.exe` before the device is inserted or connected to the PC with the included USB cable.

If you have already inserted or connected the device to the PC, the **Windows found new Hardware** wizard appears. Close this wizard and then execute the driver setup.



2. Click **[Next]** in the driver setup dialog. The initialization process starts.

3. In the driver selection dialog select your devices to be installed (or to be uninstalled).



4. Click **[Install]** to execute the driver installation, or **[Uninstall]** to remove existing drivers.
5. A confirmation dialog appears. Click **[Close]** to exit.
If the driver has been properly installed, the device can be inserted or connected to the PC with the included USB cable. The device is ready for operation now.
6. For Windows XP users only:
If the **Windows found new Hardware** wizard appears, select the option for automatic driver search to complete the installation.

2.4 Vector Hardware Configuration

Executing Vector Hardware Config

After the successful installation you will find the configuration application **Vector Hardware** in the Control Panel (see below). The tool gives you information about the connected and installed Vector devices. There are also several settings that can be changed.

Control panel Windows XP

→ Category view
Start | (Settings) | Control Panel, click in the left part of the window for further Control Panel options followed by **Vector Hardware**.

→ Classic view
Start | (Settings) | Control Panel, click **Vector Hardware** in the list.

Control panel Windows Vista

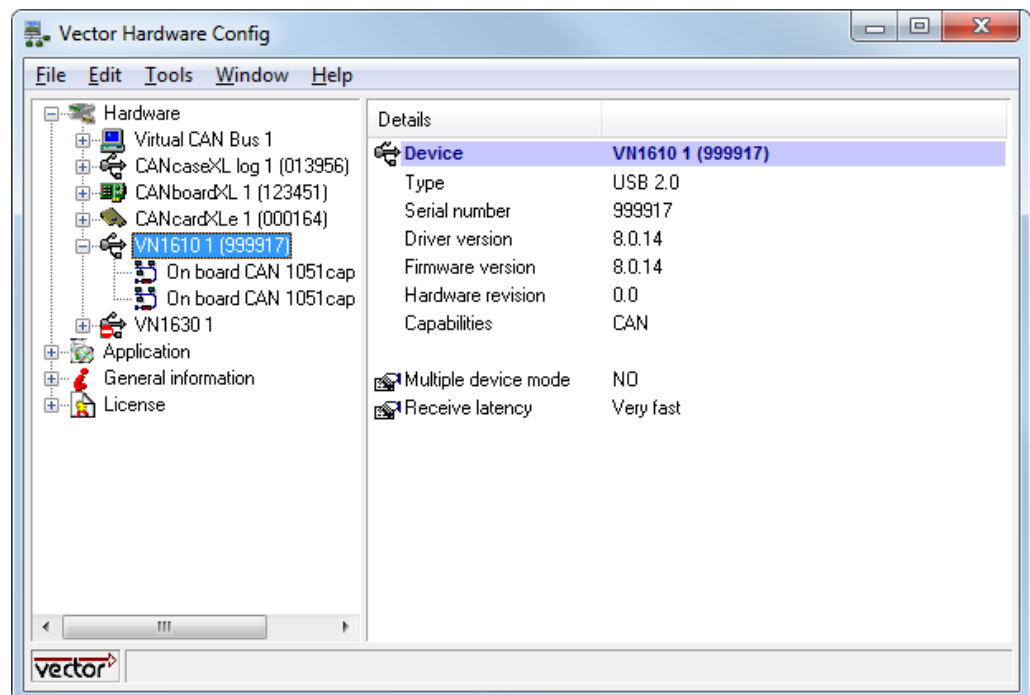
→ Category view
Start | (Settings) | Control Panel, click in the right part of the window for Additional Options followed by **Vector Hardware**.

→ Classic view
Start | (Settings) | Control Panel, click **Vector Hardware** in the list.

Control panel Windows 7

→ Category view
Start | Control Panel | Hardware and Sound, click **Vector Hardware** in the list.

→ Symbols view
Start | Control Panel, click **Vector Hardware** in the list.



The tool is split into two windows. The left window lets you access the installed Vector devices, the right window displays the details of the selection. The following nodes are available in the left window:

Hardware

Each installed Vector device is shown in **Hardware**. Additional details of available channels are shown in a tree view. Status information on the device components and the channels are also shown in this dialog.

Application

In **Application** all available applications are shown with their configured channels. If you click on an application, all of its channels are displayed in the right pane on the screen.

General information

The **General information** section contains general information on Vector devices and applications.

License

The **License** section contains information on all currently valid licenses.



Note: You will find a detailed description of **Vector Hardware Config** in the online help (**Help | Contents**).

3 Operating Test

In this chapter you find the following information:

3.1	Loop Test	page 14
	CAN	
	FlexRay	
	MOST	

3.1 Loop Test

Operating test

The test described here can be performed to check the functional integrity of the driver and the device. This test is identical for **Windows XP**, **Windows Vista**, **Windows 7** and independent of the application being used.

3.1.1 CAN

Device test

The operating test for CAN can be executed with the following devices:

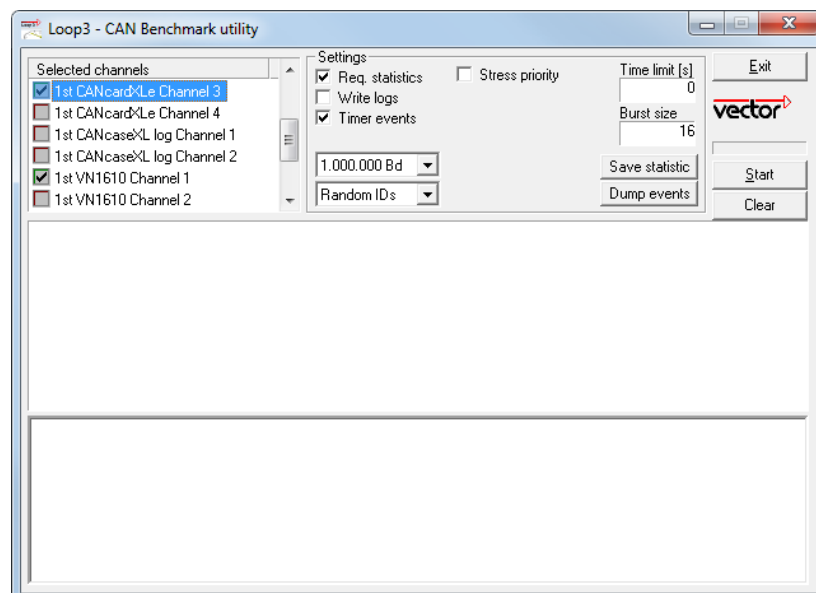
- CANcardXL
- CANcardXLLe
- CANcaseXL
- CANcaseXL log
- CANboardXL Family
- VN1610
- VN1630
- VN7600

Loop3.exe

Either two High-Speed or two Low-Speed transceivers are necessary for this functional test:

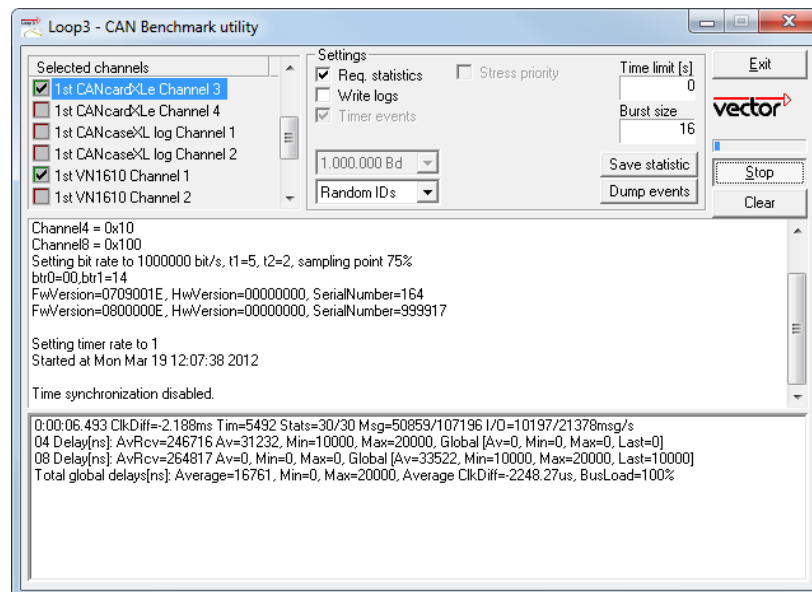


1. Connect two CAN channels with a suitable cable. If two High-Speed transceivers are being used, we recommend our **CANcable 1** (**CANcable 0** for Low-Speed transceivers).
2. Start `\Drivers\Common\Loop3.exe` from the driver CD. This program accesses the Vector devices and transmits CAN messages.
3. Select the connected CAN channels of the device(s) to be tested.
4. Set the appropriate baudrate depending on the transceiver being used (High-Speed max. 1,000,000 Bd, Low-Speed max. 125,000 Bd).
5. Click **[Start]**.

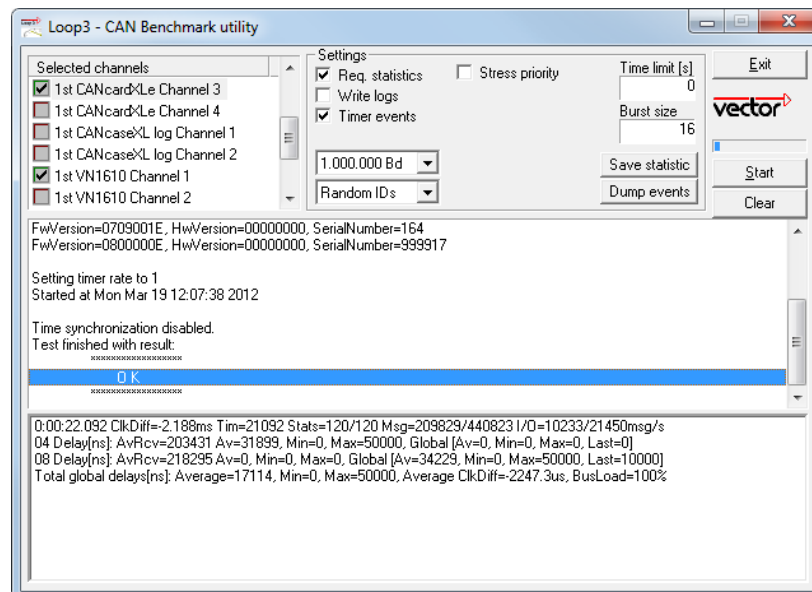


6. You will see statistical data in the lower part of the window if the system has been configured properly.

Loop3 application



7. The test procedure can be terminated with the **[Stop]** button. An **OK** should appear in the upper part of the window.



3.1.2 FlexRay

Device test

The operating test for FlexRay can be executed with the following devices:

- VN3300
- VN3600
- VN7600

FRLoop.exe

This operating test requires an inserted FRpiggy.



1. Remove the FlexRay cable if it is connected.
2. Start `\Drivers\Common\FRLoop.exe` from the driver CD.
3. Execute the test.
4. If no error messages occur, the operating test was successful.



3.1.3 MOST

Device test

The operating test for MOST can be executed with the following devices:

- VN2610
- VN2640

MLoop.exe

This functional test requires a MOST fiber optic cable and a fiber coupler for HFBR connectors.



1. VN2610
Start `\Drivers\Common\MLoop.exe` from the driver CD
- VN2640
Start `\Drivers\Common\M150Loop.exe` from the driver CD.
2. Select the VN2610/VN2640 to be tested from the list of detected devices.
3. Click **[Twinkle]** and check if the power LED of the VN2610/VN2640 is blinking at least for one second.
4. Connect the MOST fiber optic cable with the VN2610/VN2640 device, select **Master** mode and check if the program displays the status **Unlock**. Check if red light comes out of the Tx fiber of the MOST fiber optic cable.
5. Connect both ends of the fiber with one fiber coupler to a ring and check if the program displays the status **Lock**.
6. Close `MLoop.exe` with **[Exit]**.

4 Appendix A: Addresses

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