

USB-to-CAN V2 Starter Kit

USER MANUAL

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Important User Information

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1. User Guide

Please read the manual carefully. Make sure you fully understand the manual before using the product.

1.1. Target Audience

This manual addresses trained personnel who are familiar with CAN, LIN, and the applicable national standards. Only ESD trained staff is authorized to install the interface. The contents of the manual must be made available to any person authorized to use or operate the product.

1.2. Related Documents

Document	Author
Installation Guide VCI Driver	HMS

1.3. Document History

Version	Date	Description
1.0	March 2023	First release

1.4. Trademark Information

Ixxat[®] is a registered trademark of HMS Industrial Networks. All other trademarks mentioned in this document are the property of their respective holders.

1.5. Conventions

Instructions, Results and Lists

Instructions and results are structured as follows:

1. instruction 1
2. instruction 2
 - result 1
 - result 2

Lists are structured as follows:

- item 1
- item 2

Code

This font is used to represent program code and other types of data input and output such as configuration scripts.

```
Code
```

User Interaction Elements

User interaction elements (buttons etc.) are indicated with bold text.

Cross-References and Links

Cross-reference within this document: [Document Conventions](#)

External link (URL): www.ixxat.com

Safety Symbols



DANGER

Instructions that must be followed to avoid an imminently hazardous situation which, if not avoided, will result in death or serious injury.



WARNING

Instructions that must be followed to avoid a potential hazardous situation that, if not avoided, could result in death or serious injury.



CAUTION

Instruction that must be followed to avoid a potential hazardous situation that, if not avoided, could result in minor or moderate injury.



IMPORTANT

Instruction that must be followed to avoid a risk of reduced functionality and/or damage to the equipment, or to avoid a network security risk.

Information Symbols



NOTE

Additional information which may facilitate installation and/or operation.



TIP

Helpful advice and suggestions.

2. Safety Instructions



IMPORTANT

Risk of interference to radio and television if used in office or home environment!

Use exclusively included accessories. Use exclusively shielded cables.

Make sure, that the shield of the interface is connected with the device plug and the plug on the other side.

2.1. General Safety Instructions

- Protect product from moisture and humidity.
- Protect product from too high or too low temperature (see [Technical Data, p. 15](#)).
- Protect product from fire.
- Do not paint the product.
- Do not modify or disassemble the product. Service must be carried out by HMS Industrial Networks.
- Store products in dry and dust-free place.
- Only use indoors (without corrosive gas, flammable gas, dust and dirt etc.).

2.2. Intended Use

The interfaces are used to connect computer systems to CAN and LIN networks. The USB-to-CAN V2 Embedded is intended for installation in computer systems with closed housing. The USB-to-CAN V2 Compact, Professional and Automotive are intended for the connection to a computer via the USB interface.

Product versions that are not galvanically isolated are only allowed to operate inside buildings in CAN networks of maximally 30 m length (order number 1.01.0281.11001).

3. Scope of Delivery

The scope of delivery includes:

- 1 x USB-to-CAN V2 professional (2 x SUB-D9M) (1.01.0283.22002)
- 2 x termination resistors (1.04.0075.03000)
- 1 x female gender changer
- 1 x cable with four stamped plugs (2 x male, 2 x female)
- Manual
- Software and driver support available online at www.ixxat.com/support.

4. Product Description

The USB-to-CAN V2 starter kit makes it possible to easily set up and commission a CAN network and add additional components to it later on.

The USB-to-CAN V2 professional features two CAN channels which can be connected to one another using the included cable. For the purpose of bus termination, a termination resistor is to be added between SUB-D9 of the USB-to-CAN and the cable in each respective case. Additional CAN devices can be plugged in at one of the remaining available connections of the cable. If the sockets are of the wrong type, the included gender changer can be used.

Drivers for Windows and Linux can be downloaded online. canAnalyser3 Mini can be used for initial commissioning. It is a component of the VCI installation. More details to follow.

5. Installation

The USB-to-CAN V2 professional can be plugged into any USB connection of a computer. The required cables and termination resistors can be plugged in before or after connecting the USB-to-CAN to a computer.

The corresponding drivers must be downloaded online and installed accordingly. A basic monitor, canAnalyser3 Mini, is available in the Windows driver version. This can be used to send and receive CAN messages.

6. Use

A reliably functioning CAN network can be set up using the starter kit.

The following steps explain the basic process:

1. **Download and install the corresponding VCI drivers at www.ixxat.com/support.**
The individual installation steps are described in the video entitled [How to set up the Ixxat VCI driver package for USB-to-CAN V2](#).



Administrator rights on the computer are required for installation.

2. **Connect and commission individual components.**
Following successful installation of the VCI driver, the various individual components shown in the video entitled [Introducing and unboxing the USB-to-CAN V2 starter kit](#)



can now be commissioned.

3. Commission canAnalyser3 Mini.

The process is described in the video entitled [How to get started with Ixxat's canAnalyser mini](#).



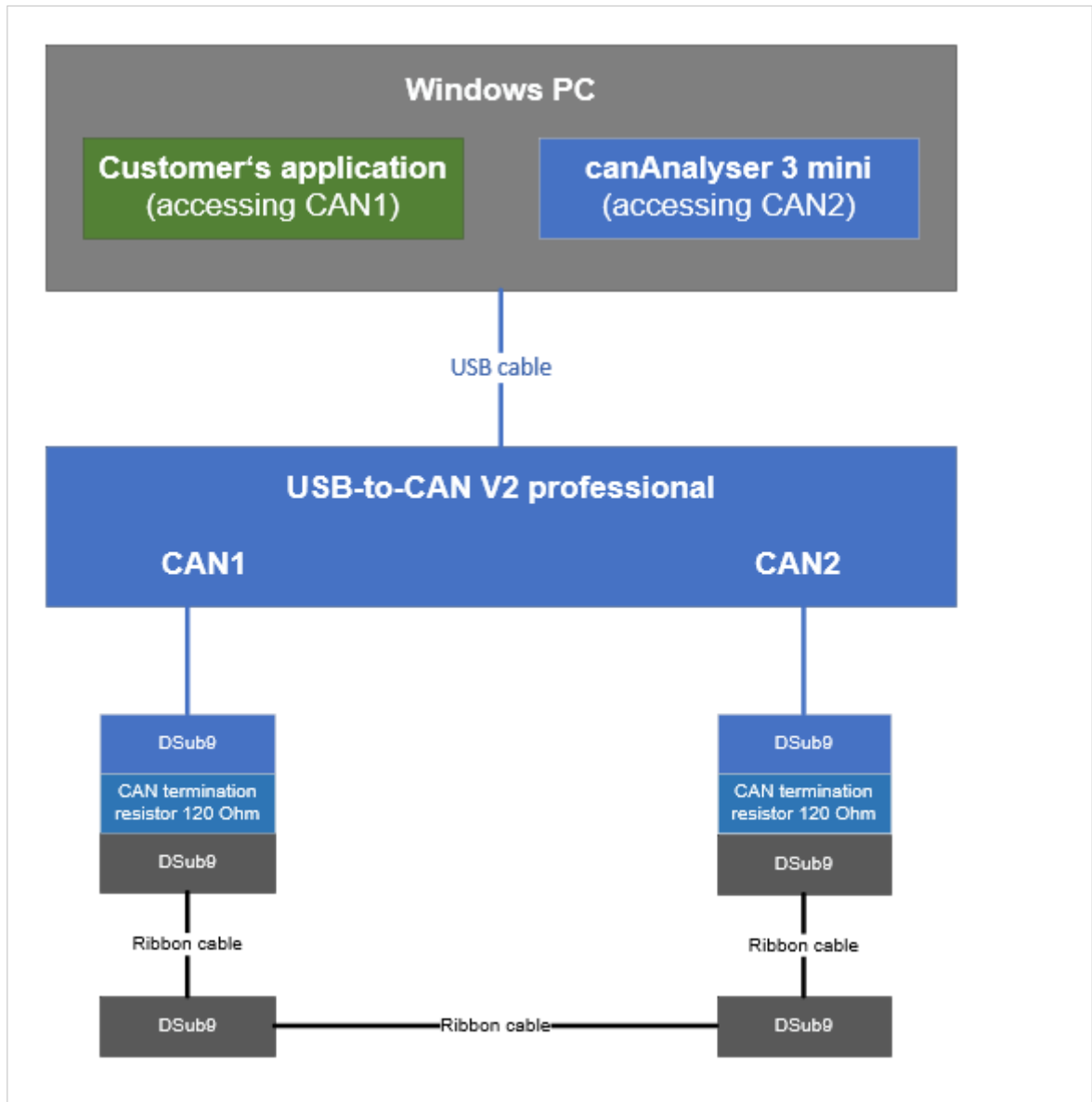
Comprehensive help instructions are also installed alongside canAnalyser3 Mini.

The following usage scenarios can also be implemented with canAnalyser3 Mini:

1. Testing of existing software.

Both interfaces of the USB-to-CAN V2 professional are connected to one another. The software must support the VCI driver interface from HMS.

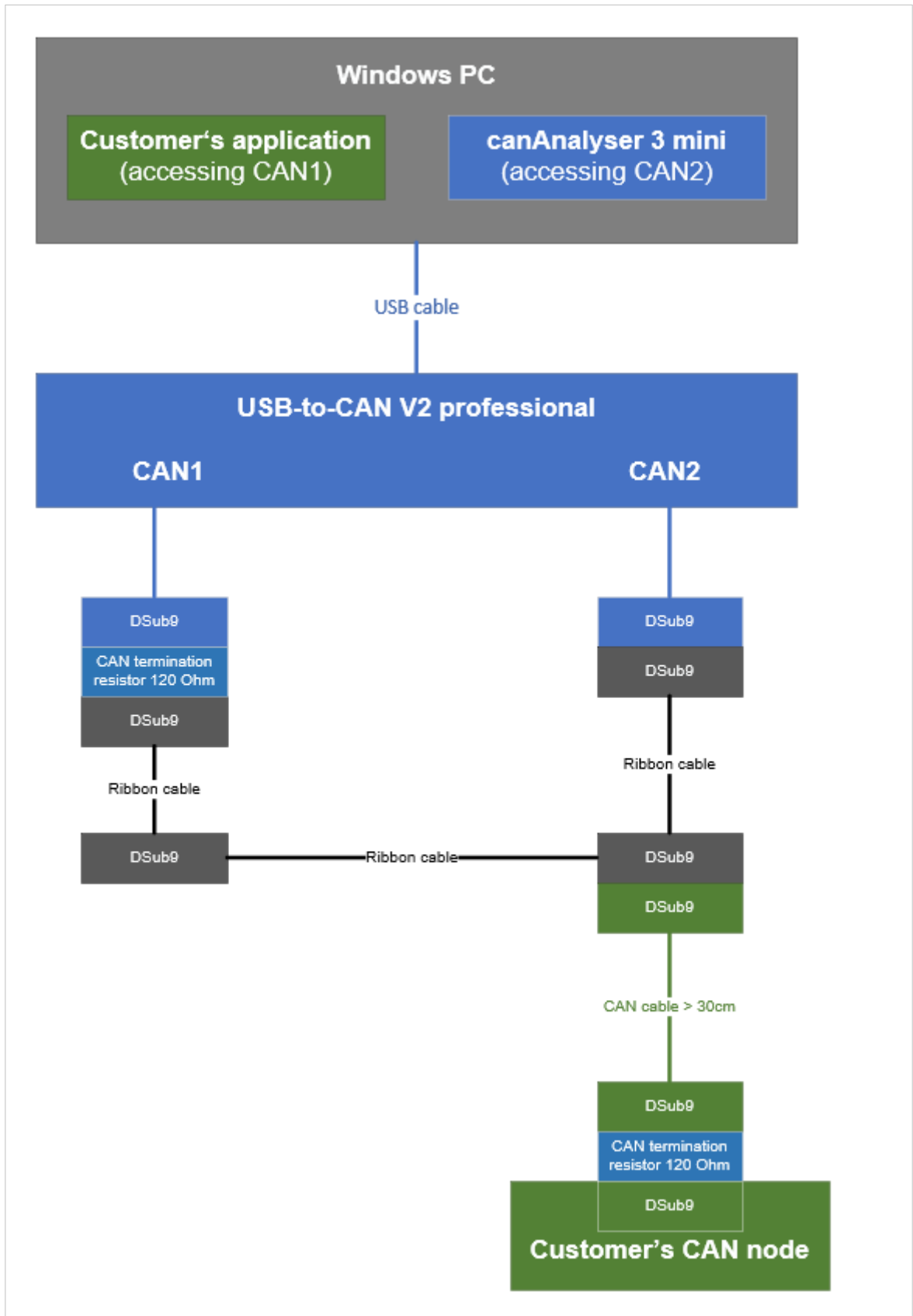
- In contrast to the explanation in the video, one channel of the USB-to-CAN V2 professional is now assigned to the application program.
- The second channel is assigned to canAnalyser3 Mini. Telegrams can now be sent to stimulate actions of the application and to check the telegrams which are sent when they occur.



2. Connecting a device or system to the available SUB-D9 of the included cable, with gender changer if required.

Both interfaces of the USB-to-CAN V2 professional are connected to one another.

- One channel of the USB-to-CAN V2 professional can now be given a fixed assignment to an application on the computer. The application exchanges messages with the connected device or system over the channel.
- The second channel is assigned to canAnalyser3 Mini. Sent and received telegrams can be recorded and checked here.
- If the length of the cable between the device or system and the connection on the supplied cable is more than 30 cm, we recommend placing one of the supplied terminating resistors between the cable and the device (see below).

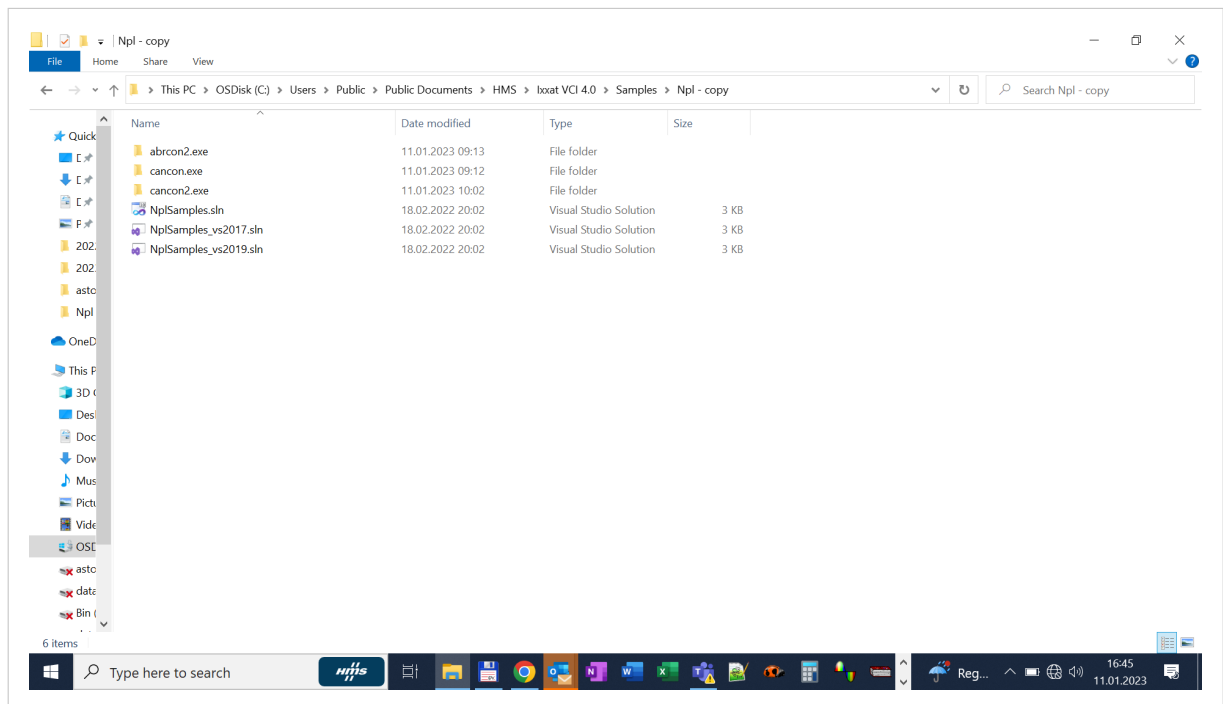


4. Generating VCI sample programs.

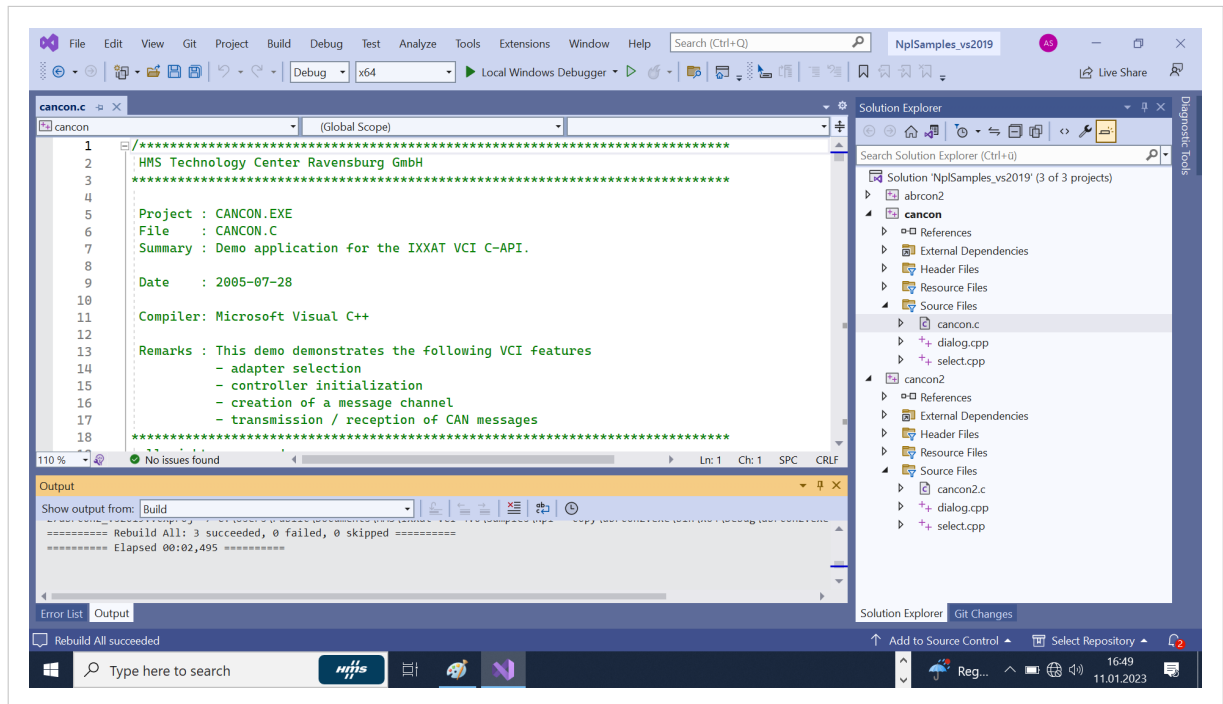
Various different programming examples are included for the APIs of the VCI driver. They can be found in `C:\Users\Public\Documents\HMS\Ixxat VCI 4.0\Samples`.

Directory		Contents
dotnet	CANConNet	Programming example for classic CAN (C#)
	CanfdConNet	Programming example for CAN FD (C#)
	CANVBNet	Programming example for classic CAN (VB.NET)
	LiNConNet	Programming example for LIN (C#)
NPL	Abrcon2	Programming example for CAN FD (C)
	Cancon	Programming example for classic CAN (C)
	Cancon2	Programming example for CAN FD (C)
\SDK\Console\src	CAN	Programming example for classic CAN (C++)
	CANFD	Programming example for CAN FD (C++)
	Common	Shared files
	FSL	Programming example for Frame and Signal Library (C++)

A sample program for classic CAN communication can be found in the *Npl* subdirectory. Visual Studio sample project *NplSamples_vs2019.sln* can also be opened here.



The source code (`cancon.c`) of the sample application in the Source Files subdirectory can be opened.



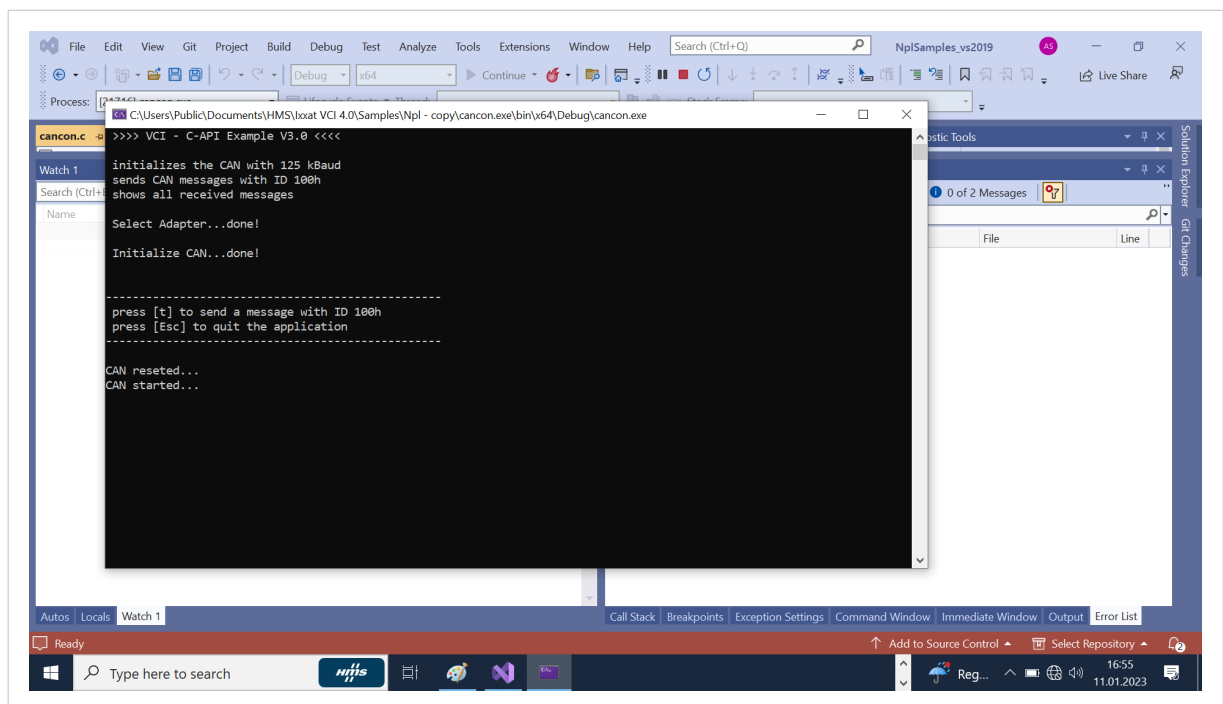
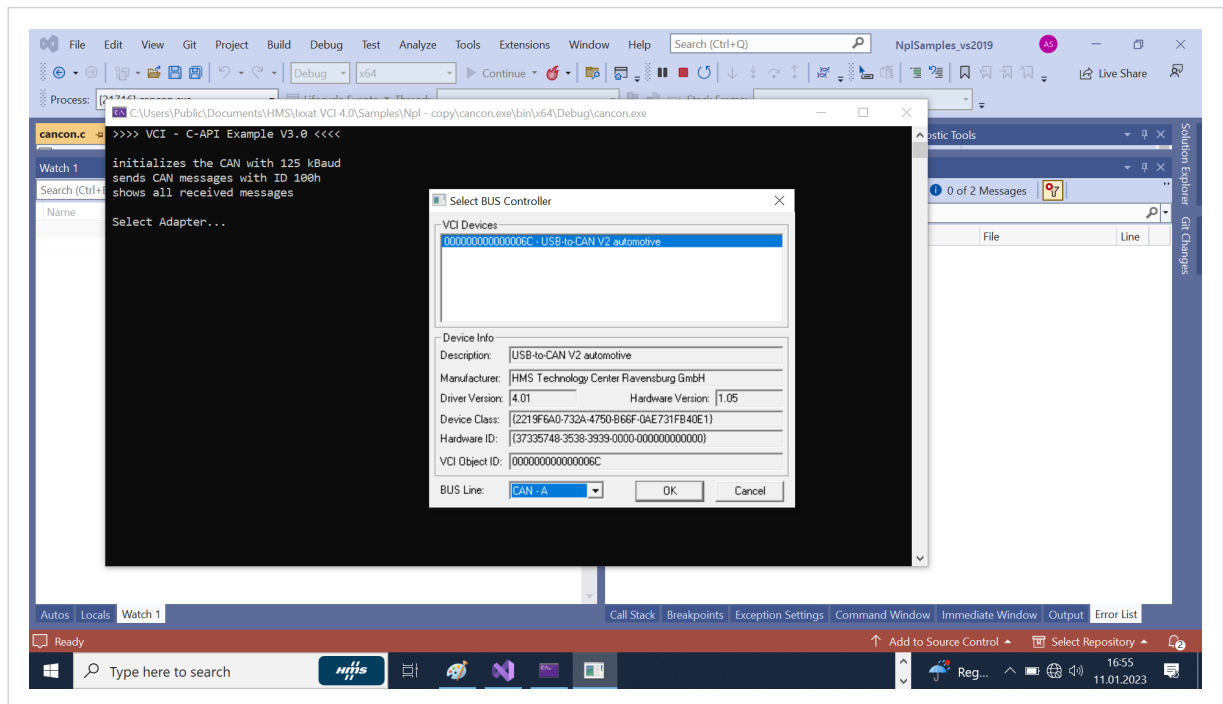
5. **Run the sample program.**

A window displaying all connected VCI devices, like the USB-to-CAN V2 professional, will open.

6. **Select device and, for BUS Line, select the channel of the USB-to-CAN V2 professional which is to be assigned to the application program.**

7. Confirm with OK.

The CAN is automatically initialized with 125 kBaud. For the selection CAN - A, the first channel of the USB-to-CAN V2 professional is assigned to the application program.



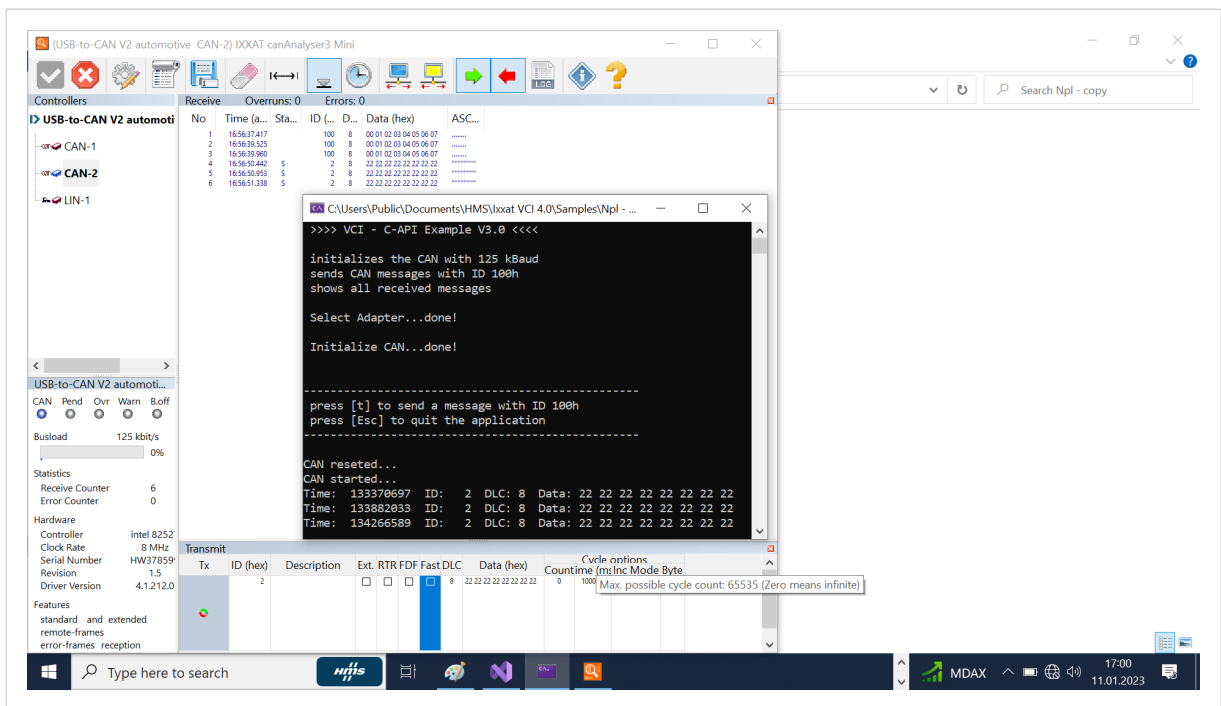
8. Assign the second channel of the USB-to-CAN V2 professional to canAnalyser3 Mini.

- Configure the baud rate to 125 kBaud accordingly.
(See video entitled [How to get started with Ixxat's canAnalyser mini](#)



for a detailed introduction to commissioning).

Telegrams can now be sent and then viewed in the console. The sample program also makes it possible to send a CAN message with the ID 100 (hex) by pressing the "T" key on the keyboard.



During the exchange of data using the VCI sample program, data traffic can be monitored using canAnalyser3 Mini. The starter kit is now fully commissioned and enables communication with other devices and programs.

7. Technical Data

Table 1. USB-to-CAN V2 professional

USB interface	USB 2.0, Hi-Speed (480 Mbit/s)
Microcontroller/RAM/Flash	32-bit/192 KB/512 KB
Dimensions	80 x 50 x 22 mm
Weight	Approx. 100g
Power supply	Via USB, 5 V DC/300 mA
Galvanic isolation	1,000 V DC for 1 sec 500 V AC for 1 min
Operating temperature	-20 to +70°C
Storage temperature	-40 to +85°C
Relative humidity	10 to 95%, non-condensing
Housing material	ABS plastic
Protection class	IP40
High-speed CAN, ISO 11898-2: 2016	
CAN bit rates	10 kbit/s to 1 Mbit/s
CAN transceiver	TI SN65HVD251
CAN bus connection	None

Table 2. Termination resistor

Connector	D-sub 9, male to female
Bus termination resistor	120 Ohm
Resistance	Between pins 2 and 7
Dimensions	31 x 19 x 13 mm
Weight	12 g
Operating temperature	-55 to +105°C
Housing material	Tin-plated housing
Pin assignment	1-to-1
Isolator	PBT-reinforced glass fiber
Contacts	Brass
Contact coating	Gold-plated nickel
Current strength	3 A
Dielectric strength	500 V AC for 1 minute
Isolator resistance	500 MOhm min. at 500 DC
Screw	UNC #4-40

Table 3. Cable

Length	235mm
Connections	2 x SUB-D9M, 2 x SUB-D9F

Table 4. Gender changer

Weight	9.5 g
Number of contacts	9
Ferrule resistance (max.)	10 mΩ
Insulating resistance (min.)	500 MΩ
Operating/storage temperature	-55°C to +105°C

8. Additional Information

Ixxat provides various different drivers for all CAN/CAN FD interfaces:

- VCI for Windows
- ECI and SocketCAN for Linux

The drivers offer various APIs for integration into the application programs:

VCI	ECI	SocketCAN
C/C++/C#	C/C++	C/C++
VB.NET		
Python		Python
CANopen		
J1939		J1939
LabView		
Matlab		

Further steps with the USB-to-CAN V2 professional:

After completing the intended tasks, the individual components can be used further:

- Network analysis with canAnalyser3 Mini (for solely passive recording of message traffic, the Tx passive option should be selected)
- EoL programming of devices using the CAN interface; flashing
- EoL testing

9. Cleaning

1. Disconnect the device from the power supply.
2. Remove dirt with a soft, chemical untreated, dry cloth.

10. Support/Return Hardware

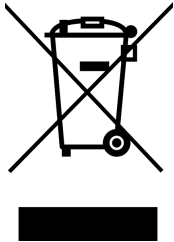
Support

1. To contact support, go to www.ixxat.com/technical-support/contact-technical-support.
2. Scroll down and click button **mysupport.hms.se** to register a support case.

Return Hardware

1. On www.ixxat.com/support/product-returns click button **Portal** to access the support portal.
2. In the support portal select **Submit Product Return (RMA)**.
3. Read the information and click **Create RMA Case**.
4. Register a support account and sign in.
5. Fill in the form for warranty claims and repair.
6. Print out the Product Return Number (PRN resp. RMA).
7. Pack product in a physically- and ESD-safe way, use original packaging if possible.
8. Enclose PRN number.
9. Observe further notes on www.ixxat.com.
10. Return hardware.

11. Disposal and Recycling



You must dispose of this product properly according to local laws and regulations. Because this product contains electronic components, it must be disposed of separately from household waste. When this product reaches its end of life, contact local authorities to learn about disposal and recycling options, or simply drop it off at your local HMS office or return it to HMS.

For more information, see www.hms-networks.com.