



# Zeno 42X CANquatro

USB - CAN-HS/CAN FD/LIN INTERFACE

## User Manual

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## Table of Contents

1	Revision History	2
2	Abbreviations	2
3	Introduction	2
4	Technical Specification	3
4.1	Features	3
4.2	Connectors	3
4.2.1	Connectors USB side	3
4.2.2	Connectors Bus side	4
4.3	Split cable	5
4.3.1	1F4F split cable	6
4.3.2	1F4M split cable	7
4.4	LED status	8
5	Working on Windows OS	9
5.1	Install the driver	9
5.2	Using CAN and CAN FD in Vicando/Vicanlog	11
5.3	Using LIN in Vicando/Vicanlog	12
6	Working on Linux OS	13
7	Firmware update	13
8	Scope of delivery	13
9	Legal Information	14
9.1	About this document	14
9.2	Trademarks	14
10	References	14

## 1 Revision History

Date	Revision	Author	Description
04.05.2020	1.0	HL	Initial draft
14.07.2020	1.1	HL	Added more instructions of using CANquatro in vicando
06.08.2020	1.2	HL	Added more description for the split cables and instruction for working on Linux OS

## 2 Abbreviations

Below is a list of abbreviations used in this document.

Spec	Specification
HW	Hardware
SW	Software

## 3 Introduction

Zeno42X CANquatro (CANquatro in this document) is a lightweight compact multiple network interface for accessing four CAN-HS/FD channels, two CAN-HS channels as well as two LIN channels on one single device. It is connected via USB to the host PC where Vicando/Vicanlog is running. From software point of view, the timestamping of fieldbus messages often drift a lot over time when using third party USB-CAN interfaces. To solve this issue, we developed our own interface for a much better timing performance.

## 4 Technical Specification

The Zeno 42X CANquatro comes with a USB B port, two male 9-pin D-sub connectors for CAN-HS/CAN FD/LIN interfaces. The device can be powered via the USB connector (5V) if you are connecting the CANquatro to the battery of the vehicle.



Note: DO NOT exceed the maximum voltage rate Zeno 42x CANquatro can handle. Any misuse of the hardware will result in void warranty. Each hardware has a one (1) year of limited warranty.

### 4.1 Features

- Supports 2 High Speed CAN (ISO 11898-2) channels up to 1Mbit/s
- Support 4 additional CAN FD channels.
- Supports CAN 2.0 B.
- Support two LIN channels.
- Supports LIN 2.2A (ISO 17987)/J2602 protocols.
- Synchronization between multiple channels.
- Time stamp precision 1 microsecond
- Integration with ViCANdo suite.
- Powered by USB.
- Six LEDs for bus activity and device status indication.
- Operating temperature range from -40 to 85 °C.
- Supports silent mode.
- Timestamp precision of 1  $\mu$ s.

### 4.2 Connectors

#### 4.2.1 Connectors USB side

The USB connector is used to connect the CANquatro to the host computer via a USB A/B cable. Make sure the power is enough if you are connecting via a USB hub.



Figure 1 USB side

#### 4.2.2 Connectors Bus side

There are two male 9-pin d-sub connectors on each CANquattro box. They are labeled “DB9-1” and “DB9-2” respectively.



Figure 2 Bus connector side

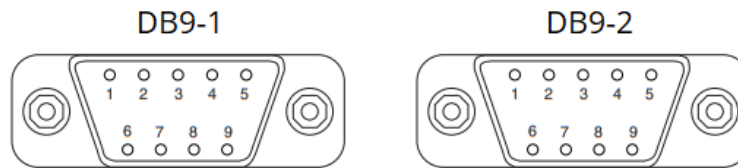


Figure 3 CANquatro D-sub 9 connectors

The pin assignment is as follows:

D-sub pin	DB9-1	DB9-2
1	CAN 5 Low	CAN 6 Low
2	CAN 1 Low (CAN FD)	CAN 2 Low (CAN FD)
3	LIN 1 bus (Signal line that carries the data on the LIN)	LIN 2 bus
4	CAN 3 Low (CAN FD)	CAN 4 Low (CAN FD)
5	CAN 5 High	CAN 6 High
6	GND	GND
7	CAN 1 High (CAN FD)	CAN 2 High (CAN FD)
8	CAN 3 High (CAN FD)	CAN 4 High (CAN FD)
9	LIN 1 12V (Supplies bus power to the LIN physical layer, as required by the LIN specification)	LIN 2 12V

Notes:

- There is no termination for CAN-HS and CAN FD inside CANquatro. You need extra termination on both ends of the connected CAN bus.
- 4 CAN high speed channels can be used for CAN FD as well. You cannot use both CAN and CAN FD on **one** channel simultaneously in Vicando.
- For LIN operation, an additional 12V DC voltage supply is needed for each LIN bus.

### 4.3 Split cable

The split cable is used for separating several bus networks for CANquatro. The cable is not terminated. You will need to add extra bus terminators for high-speed CAN and CAN FD buses.



Figure 4 1F4F split cable

### 4.3.1 1F4F split cable

1F4F split cable has 1 **female** 9-pin D-sub connector on one end (which will be connected to the CANquatro), 4 x **female** 9-pin D-sub connectors on the other end which should be connected to the CAN-HS/CAN FD/LIN buses.

Cable length of 1 meter.

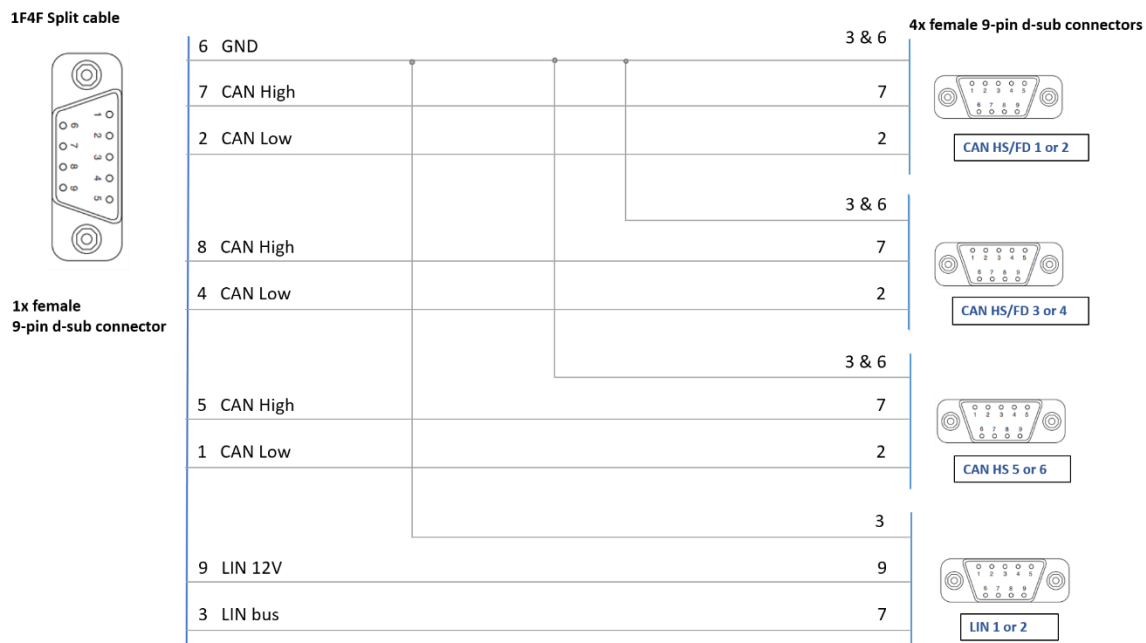


Figure 5 1F4F split cable wiring

### 4.3.2 1F4M split cable

1F4M split cable has 1 **female** 9-pin D-sub connector on one end(which will be connected to the CANquatro), 4 **male** 9-pin D-sub connectors on the other end that which should be connected to the CAN-HS/CAN FD/LIN buses.

Cable length of 60 cm.

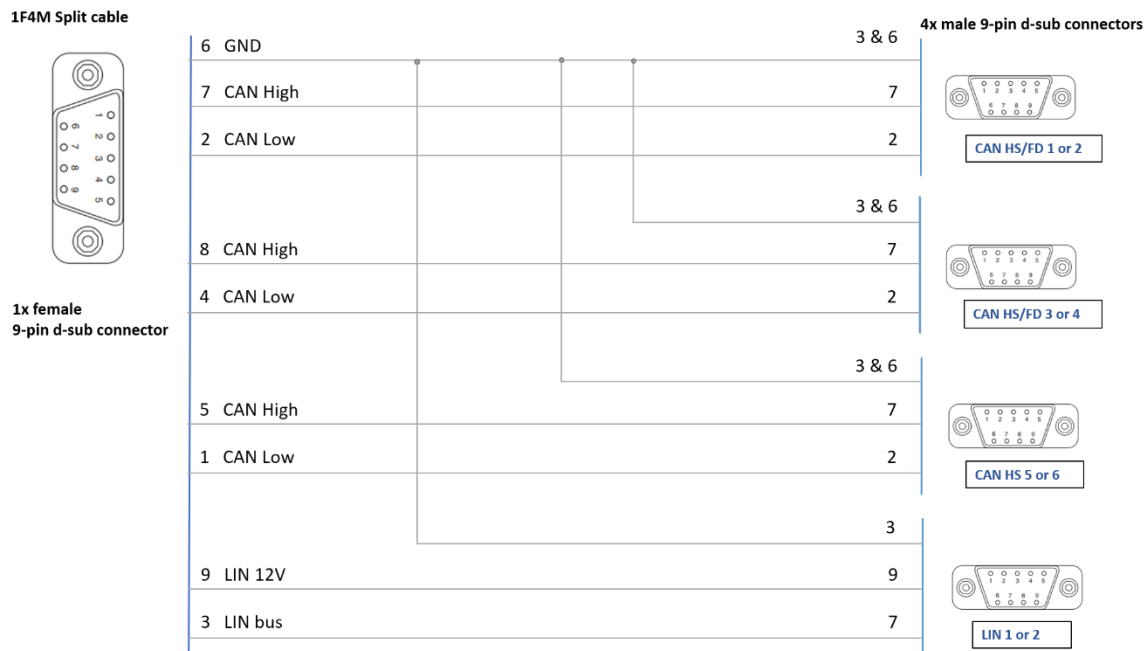


Figure 6 1F4M split cable wiring



## 4.4 LED status

There are six LEDs next to the USB port on CANquatro.



Figure 7 Front label



Figure 8 LEDs

LED	Status	Description
USB PWR	Blue on	USB connection (USB 2.0) with computer is established. USB driver is working properly.
RX	Blue on	Received a CAN or CAN FD or LIN message.
TX	Blue on	Transmitted a CAN or CAN FD or LIN message.
ERROR	Red on	An error occurred during the transmission of CAN data or LIN data.
LIN 2 PWR	Green on	LIN 2 is powered up.
LIN 1 PWR	Green on	LIN 1 is powered up.

## 5 Working on Windows OS

This device is used together with Vicando software. Follow below steps to get started:

1. Download Vicando for Windows OS from this link: <https://www.zuragon.com/downloads/> and install the software
2. Open the software and register yourself a 30 days trail license

### 5.1 Install the driver

Plug in the CANquatro to your computer via USB port.

In device manager you will see below device:

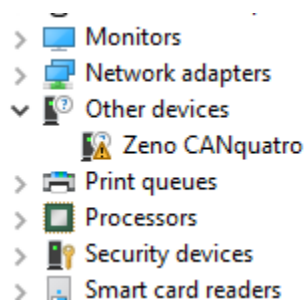


Figure 9 CANquatro shows up in Device Manager

Next step is to install the driver. Download a tool called Zadig from below link:

<https://zadig.akeo.ie/>

Double click on the Zadig executable file to run. Zeno CANquatro will be detected automatically. Select “**libusbK**” and click button “Install Driver” to install.

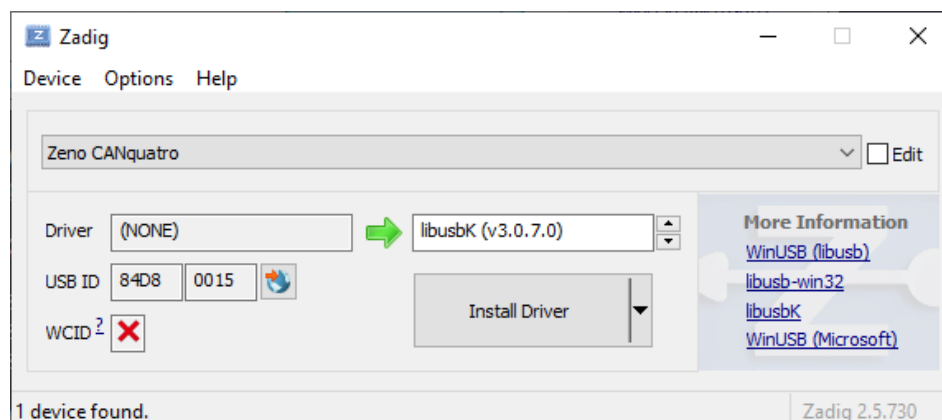


Figure 10 Zadig tool

After the driver is installed, refresh device manager list and the yellow question mark on “Zeno CANquatro” is gone. It means the driver has been installed successfully. Below image shows when the driver is installed successfully:

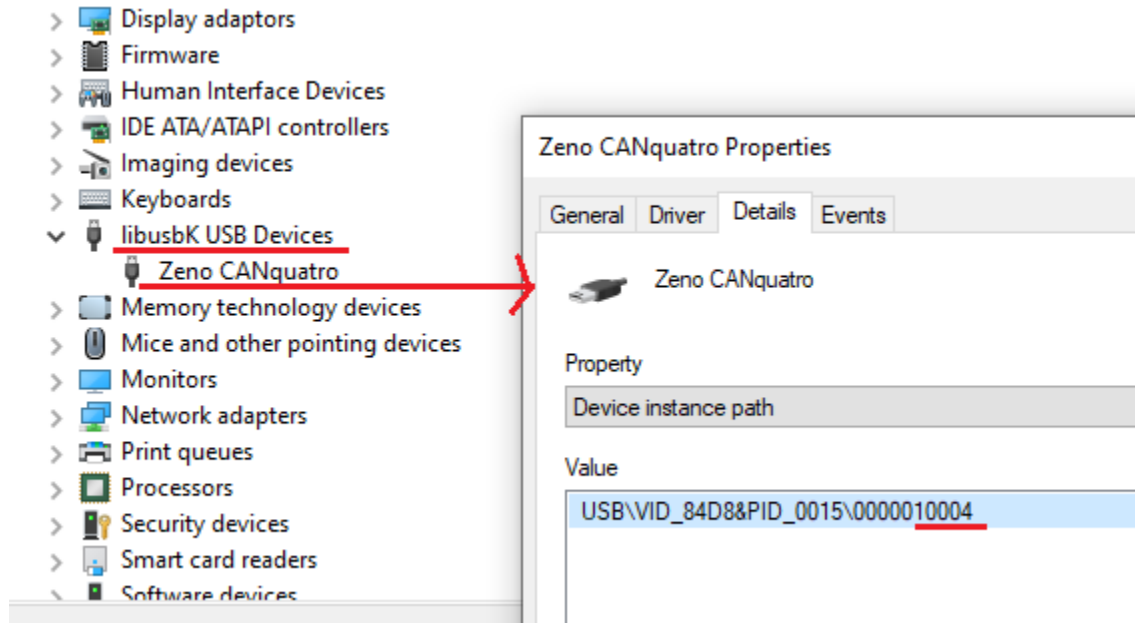


Figure 11 Serial number

Check that the “USB PWR” LED is ON constantly.

## 5.2 Using CAN and CAN FD in Vicando/Vicanlog

Plug in CANquatro to the computer via the USB cable. Open Vicando and create a new project.

Add CAN source, select the CANquatro channel you want to use.

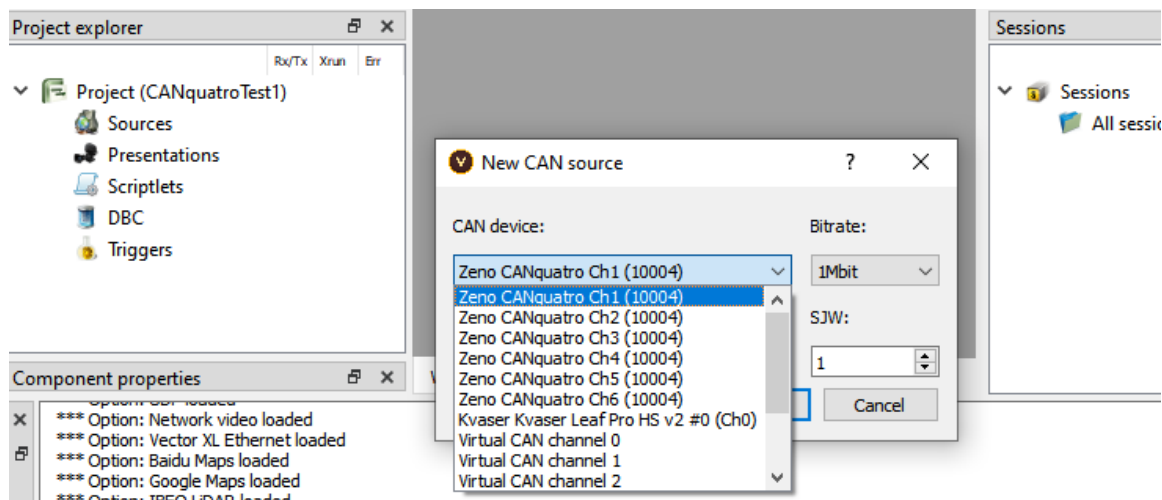


Figure 12 Using CAN in Vicando

Configure the properties on the “Component properties” window of the CAN source:

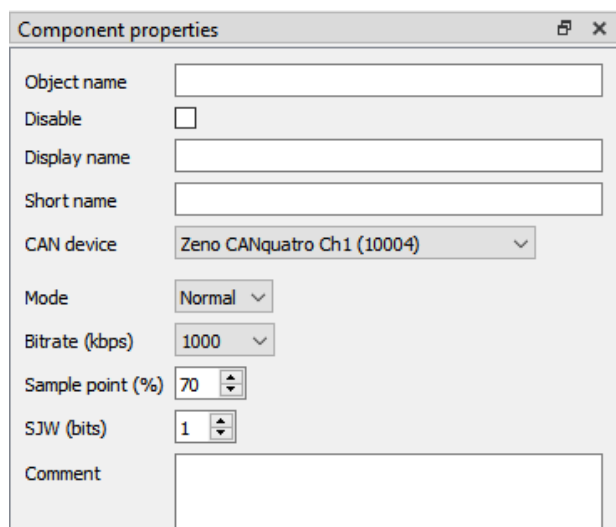


Figure 13 CAN source component properties



Note: Bitrate limitations: CAN-HS 5 and CAN-HS 6 can run up to 500 kbps.

Then add a database file to your project, add a fixed trace or multi trace that is attached to the database file for the CAN source.

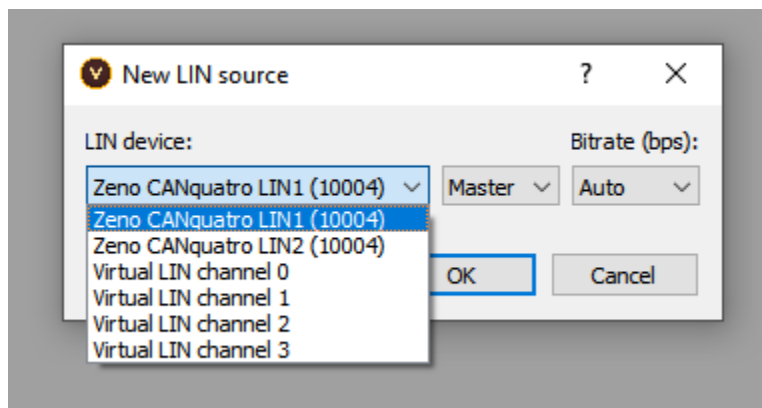
Follow Vicando manual to learn more:

<https://www.zuragon.com/docs/manual/basic%20functions.html>

### 5.3 Using LIN in Vicando/Vicanlog

Open a project or create a new project.

Add LIN source, select the LIN channels of the CANquatro:



*Figure 14 Using LIN in Vicando*

Configure the properties in the “Component properties” window of the LIN source.

Add a fixed trace or multi trace for the LIN source.

## 6 Working on Linux OS

First of all, we need to give user permission to access CANquatro.

Create a file called "Z99Zeno.rules" and paste below content:

```
SUBSYSTEM=="usb", ATTR{idVendor}=="84d8", MODE="0666"
```

Save the file and paste the file to directory: /etc/udev/rules.d

(you need "sudo" to paste files in that directory)

Unplug and plugin CANquatro to the USB port. Test the device is detected in Vicando/vicanlog.

## 7 Firmware update

Please send email to [support@zuragon.com](mailto:support@zuragon.com) for help.

## 8 Scope of delivery

- 1x Zeno 42x CANquatro interface
- 1x USB 2.0 A/B cable
- 2x 1F4F split cables (1 meter) with 8 x gender changers
  - or 2 x 1F4M split cables (60 cm)
- 1x 120-ohm CAN bus terminator
- Manual in PDF format

Contact [info@zuragon.com](mailto:info@zuragon.com) for sales request.

## 9 Legal Information

### 9.1 About this document

This document may not be reproduced without our prior written permission.

We believe that the information in this user guide was accurate at the time of printing. Zuragon cannot, however, assume responsibility for any errors or omissions in this document. The information in this document is subject to change without notice and should not be taken as a commitment by Zuragon.

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### 9.2 Trademarks

All product names mentioned in this manual are registered or unregistered trademarks of their respective owners.

## 10 References