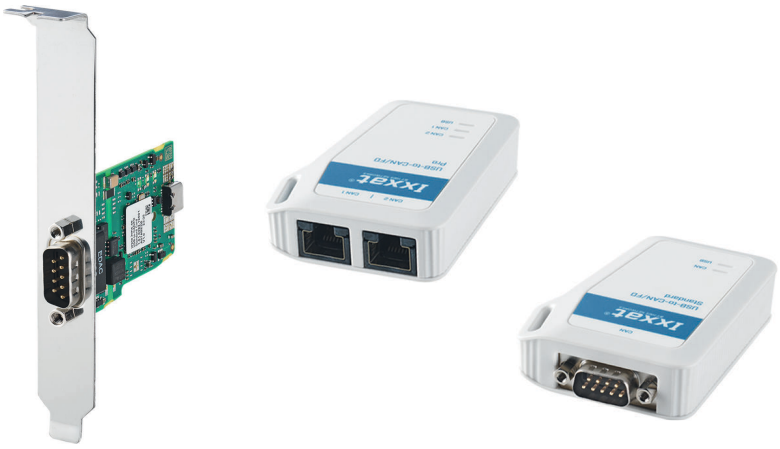
Ixxat® BY HMS NETWORKS

ENGLISH

USB-to-CAN/FD Standard / Standard Card / Pro

USER MANUAL

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Important User Information

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Table of Contents

1. User Guide 1
1.1. Target Audience 1
1.2. Related Documents 1
1.3. Document History 1
1.4. Trademark Information 1
1.5. Conventions 1

2. Safety Instructions 3
2.1. General Safety Instructions 3
2.2. Intended Use 3

3. Scope of Delivery 4

4. Product Description 5

5. Installation 7
5.1. Installing the Software 7
5.2. Installing the Hardware 7
5.2.1. Connecting USB 7
5.2.2. Connecting the CAN Fieldbus 9

6. Operation 11

7. Additional Components 12
7.1. CAN Bus Termination Resistor 12

8. Technical Data 13

9. Troubleshooting 16

10. Cleaning 17

11. Support/Return Hardware 18

12. Regulatory Compliance 19
12.1. EU Compliance (CE) 19
12.2. FCC Compliance Statement 19
12.3. Disposal and Recycling 20

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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, CAN FD 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	August 2025	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.hms-networks.com/ixxat

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
The use of shielded cables is recommended.

When using a shielded cable, ensure that the cable's shield is connected to both the device plug and the plug on the other end.

2.1. General Safety Instructions

- Protect product from moisture and humidity.
- Protect product from too high or too low temperature (see Technical Data, p. 13).
- 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 CAN FD networks. The USB-to-CAN/FD Standard Card is intended for installation in computer systems with closed housing. The USB to CAN/FD Standard and Pro are intended for the connection to a computer via the USB interface.

3. Scope of Delivery

- Interface
- Safety and Compliance Information
- Variant USB-to-CAN/FD Standard: USB cable with plug type C to type A
- Variant USB-to-CAN/FD Standard Card: USB cable with plug type C to 5 pos. header, Slot bracket
- Variant USB-to-CAN/FD Pro: USB cable with plug type C to type A, 2x RJ45 to D-Sub 9 adapter cable

The following equipment can be ordered separately:

- CAN bus termination

Drivers for Windows, Linux and real-time operating systems, including programming examples, tools and software design guides are available on https://www.hms-networks.com/support/general-downloads.

4. Product Description

The USB-to-CAN/FD is an active USB interface which enables the user to monitor and control ISO CAN FD, non-ISO CAN FD and CAN High Speed networks. The USB-to-CAN/FD product family supports up to two channels depending on the variant.

USB-to-CAN/FD Standard / Standard Card



Figure 1. USB-to-CAN/FD Standard and Standard Card (D-Sub 9)

- USB 2.0 hi-speed (480 Mbit/s), compatible with USB 3.x
- USB Type C connector
- 1 x CAN FD interface with three operation modes:
  - ISO CAN FD according ISO 11898-1: 2015
  - non-ISO CAN FD
  - CAN high-speed according ISO 11898-2: 2016
- galvanic CAN bus isolation
- fieldbus connection:
  - USB-to-CAN/FD Standard: D-Sub 9
  - USB-to-CAN/FD Standard Card: D-Sub 9
- variant USB-to-CAN/FD Standard Card: slot bracket and internal USB cable
- variant USB-to-CAN/FD Standard: Type C to type A USB cable

USB-to-CAN/FD Pro



Figure 2. USB-to-CAN/FD Pro

- USB 2.0 hi-speed (480 Mbit/s), compatible with USB 3.x
- USB type C connector
- 2 x CAN FD interface with three operation modes:
  - ISO CAN FD according ISO 11898-1: 2015
  - non-ISO CAN FD
  - CAN high-speed according ISO 11898-2: 2016

  Operation mode can be set for each port individually.
- galvanic fieldbus isolation (all fieldbus channels are on the same potential)
- fieldbus connection: 2 x RJ45 (2x D-SUB 9 possible with adapter cables included in the delivery scope)
- Type C to type A USB cable

5. Installation

5.1. Installing the Software

For the installation of the USB-to-CAN/FD a driver is needed.

Windows

IMPORTANT
The VCI driver is constantly improved and expanded! Check if a newer version is available on www.ixxat.com/driver-windows.

1. Download the latest VCI driver from www.ixxat.com/driver-windows.
2. Install the VCI driver (see Installation Guide *VCI Driver*).

Linux and Real-Time Operating Systems

1. Observe information about supported operating systems and interfaces on www.ixxat.com/support.
2. After downloading a driver, observe the *ReadMe* file or installation guide in the downloaded driver package.

5.2. Installing the Hardware

5.2.1. Connecting USB

IMPORTANT
Connection disturbance possible if extension cable or longer cable is used!

HMS recommends connecting the interface directly with the included cable or via an active USB hub to the computer according to the USB specification.

IMPORTANT
Insufficient power supply!

Connect the interface directly to the computer or to self-powered hubs to ensure sufficient power supply.

IMPORTANT
When connecting the included USB cable to the USB-to-CAN/FD, tighten the screws carefully by hand. Do not overtighten.

USB-to-CAN/FD Standard / Pro

1. Make sure that the driver is installed.
2. Plug the USB cable in a USB port of the computer and the USB-to-CAN/FD.
   - The operating system automatically finds and installs the hardware.
   - USB LED becomes green flashing or green.

NOTE
USB interface supports hot plug!

It is possible to plug or unplug the device during operation.

USB-to-CAN/FD Standard Card

IMPORTANT
Risk of ESD damages caused by improper handling!

Use ESD protective measures to avoid equipment damage.

IMPORTANT
Damaged device caused by reverse polarity or wrong power supply!

Make sure that power is connected with correct polarity and that power supply is of recommended type.

- USB cable with 5 pin female connector
- Assignment corresponds to PC standard for internal USB devices.

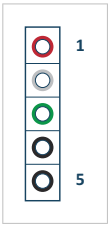


Figure 3. Standard wire assignments 1x5 header connector female

1	Red: +5 V/voltage +/VCC
2	White: D-/data-/USB-
3	Green: D+/data+/USB+
4	Black: GND/voltage-/ground
5	Black: GND

1. Make sure that the driver is installed.
2. Turn off the computer.
3. Pull the power cord.
4. Open the computer case according to instructions of the computer manufacturer.
5. Mount the bracket with the USB-to-CAN/FD Standard Card in the suitable slot.
6. Connect the USB C plug of the USB cable with the USB-to-CAN/FD Standard Card.
7. Plug the USB connector in the suitable slot on the computer main board.
8. Close the computer case.

Hardware installation is complete.

5.2.2. Connecting the CAN Fieldbus

The assignment of the fieldbus connectors (D-Sub 9 and RJ45) is in accordance to CiA 303-1.

The shield of the CAN connector is connected to the USB shield via a 4.7 MOhm and a 10 nF capacitor. The included USB cable has a connection between USB ground and USB shield.

NOTE
For best noise immunity connect the shields of the CAN cables directly to the connector shield on D-Sub 9 or RJ45 connector.

USB-to-CAN/FD Standard and Standard Card Pin Allocation

Signal	Pin No. D-Sub 9
CAN high	7
CAN low	2
CAN GND	3

Other pins are not connected.

USB-to-CAN/FD Pro Pin Allocation

Signal	RJ45 CAN 1, Pin No.	RJ45 CAN 2, Pin No.	Adapter cable D-Sub 9, Pin No.
CAN high	1	1	7
CAN low	2	2	2
CAN GND	3, 7	3, 7	3, 6

Other pins are not connected.

Connecting the Fieldbus

1. If necessary install a bus termination (see CAN Bus Termination Resistor, p. 12).
2. Observe pin allocation.
3. Connect the CAN fieldbus connector to the CAN fieldbus.

Using USB-to-CAN/FD with Ixxat canAnalyser3 mini

1. Ensure that the Ixxat VCI driver is installed (see Installing the Software, p. 7).
2. Start the Ixxat canAnalyser3 mini on the computer.
3. In the canAnalyser3 mini adjust the USB-to-CAN/FD bus settings according to fieldbus characteristics:

   IMPORTANT
   Devices which only support CAN 2.0 (CAN high-speed) destroy CAN FD telegrams!

   Only use CAN FD format in networks purely using CAN FD devices or with CAN 2.0 devices unplugged or switched to standby.

   - To activate CAN FD, activate the checkbox **Use CAN FD format**.
   - To use ISO CAN FD frames, activate the checkbox **Use ISO conform frame**.
   - To use non-ISO CAN FD frames, deactivate the checkbox **Use ISO conform frame**.

     IMPORTANT
     ISO CAN FD frames and non-ISO CAN FD frames are incompatible!

     Use either ISO CAN FD or non-ISO CAN FD in the fieldbus network.

   - Select a predefined CAN FD bitrate in drop-down list **Bitrate**.

     NOTE
     With a predefined CAN FD bitrate the CAN FD standard bit timing and the CAN FD fast bit timing are specified and bit rate switching is enabled.

4. Define the CAN messages to be transmitted in the transmit window of the canAnalyser3 mini.
5. To transmit CAN messages with flexible data rate, activate the boxes **FDF** and **Fast**.
6. Start the canAnalyser3 mini communication.
   - Received CAN messages are shown in the receive window of the canAnalyser3 mini.
   - CAN LED is green flashing with each CAN message. Flashing frequency is determined by busload.

6. Operation

The implemented LEDs vary dependent on the variant of the USB-to-CAN/FD.

USB-to-CAN/FD Standard	USB-to-CAN/FD Pro
	

USB LED

Reflects the status of the USB communication.

LED state	Description	Comments
Off	No communication	Device not initialized, check power supply. Device not connected to USB port. Charge-only USB cable is used.
Green	Communication possible	Device is ready for use.
Green flashing	Stand-by mode	Device is in energy saving mode.
Orange	USB 1.1 detected	The device was enumerated by an USB 1.1 host. USB 1.1 is not supported.
Red	No driver installed	Please install a supported driver.

CAN LED

Reflects the status of CAN communication (CAN 1 and CAN 2).

LED state	Description	Comments
Off	No communication	No communication Device not connected to CAN.
Green flashing	Communication present	Flashing frequency is determined by busload.
Red flashing	Controller in error state	Controller is in state *error warning* or in state *error passive*, communication is possible.
Red	Bus off	Controller is in state *bus off*, no communication possible.

7. Additional Components

7.1. CAN Bus Termination Resistor

HMS Networks offers a bus termination resistor as a feed through connector (article no. 1.04.0075.03000).



Figure 4. CAN bus termination resistor

- For ordering information see www.hms-networks.com.

8. Technical Data

USB-to-CAN/FD Standard

CAN / CAN FD channels	1
CAN high-speed interface	1 x D-Sub 9, CiA standard pinning according to CiA 303-1
CAN high-speed rates	10 kbit/s to 1000 kbit/s
CAN FD bit rates	up to 1000 kbit/s arbitration rate with up to 8000 kbit/s data rate
CAN bus termination resistors	-
CAN controller	Internal; ISO 11898-2:2015 CAN and CAN FD
CAN high-speed transceiver	TCAN1044 or compatible
Galvanic isolation	1 kV DC for 1 min.
USB interface	USB 2.0 hi-speed (480 Mbit/s), compatible with USB 3.x
USB connector	Type-C device connector and cable with Type-C and Type A with locking screws
Microcontroller	32 bit, ARM, 160 MHz
Power supply	+5 V DC/300 mA (via USB port)
Dimensions	76.3 x 56.4 x 21.0 mm
Operating temperature	-40 °C to +70 °C
Storage temperature	-40 °C to +85 °C
Protection class	IP40
Relative humidity	10 % to 95 %, non-condensing
Certification	CE, FCC
Housing material	PS ABS plastic
LED	2x LEDs for CAN and USB communication
Operating systems	Windows 11, Windows 10 (32/64), Linux, QNX and VxWorks

USB-to-CAN/FD Standard Card

CAN / CAN FD channels	1
CAN high-speed interface	1 x D-Sub 9, CiA standard pinning according to CiA 303-1
CAN high-speed rates	10 kbit/s to 1000 kbit/s
CAN FD bit rates	up to 1000 kbit/s arbitration rate with up to 8000 kbit/s data rate
CAN bus termination resistors	-
CAN controller	Internal; ISO 11898-2:2015 CAN and CAN FD
CAN high-speed transceiver	TCAN1044 or compatible
Galvanic isolation	1 kV DC for 1 min.
USB interface	USB 2.0 hi-speed (480 Mbit/s), compatible with USB 3.x
USB connector	Type-C device connector and internal cable
Microcontroller	32 bit, ARM, 160 MHz
Power supply	+5 V DC/300 mA (via USB port)
Dimensions	67.5 x 40.0 x 13.6 mm
Operating temperature	-40 °C to +85 °C
Storage temperature	-40 °C to +85 °C
Protection class	none
Relative humidity	10 % to 95 %, non-condensing
Certification	CE, FCC
LED	2x LEDs for CAN and USB communication
Operating systems	Windows 11, Windows 10 (32/64), Linux, QNX and VxWorks

USB-to-CAN/FD Pro

CAN / CAN FD channels	2
CAN high-speed interface	2 x RJ45 connector according to CiA 303-1
CAN high-speed rates	10 kbit/s to 1000 kbit/s
CAN FD bit rates	up to 1000 kbit/s arbitration rate with up to 8000 kbit/s data rate
CAN bus termination resistors	-
CAN controller	Internal; ISO 11898-2:2015 CAN and CAN FD
CAN high-speed transceiver	TCAN1044 or compatible
Galvanic isolation	1 kV DC for 1 min.
USB interface	USB 2.0 hi-speed (480 Mbit/s), compatible with USB 3.x
USB connector	Type-C device connector and cable with Type-C and Type A with locking screws
Microcontroller	32 bit, ARM, 160 MHz
Power supply	+5 V DC/300 mA (via USB port)
Dimensions	73.2 x 56.4 x 21.0 mm
Operating temperature	-40 °C to +70 °C
Storage temperature	-40 °C to +85 °C
Protection class	IP40
Relative humidity	10 % to 95 %, non-condensing
Certification	CE, FCC
Housing material	PS ABS plastic
LED	3x LEDs for CAN 1, CAN 2 and USB communication
Operating systems	Windows 11, Windows 10 (32/64), Linux, QNX and VxWorks

9. Troubleshooting

USB LED is off after installation.	
No communication	1. Make sure that the device is correctly connected to a USB port. 2. Check the power supply. 3. Make sure that device and driver are correctly initialized. 4. Make sure that no charge-only USB cable is used.
USB LED is red.	
No appropriate USB driver is installed.	• Check if the most recent driver is installed.
USB LED is orange.	
USB 1.1 is active.	• Use a USB 2.0 host.
Device is not working.	
Adapter cable is not according to specification.	• Use an adapter cable according to the specification.
USB extension cable is used.	1. Remove the USB extension cable. 2. According to the USB specification connect the interface directly or via an active USB hub to the computer.
Device is not initialized.	• Initialize the device with canAnalyser (see Connecting the CAN Fieldbus, p. 9).
Device is attached via non-self powered USB hub.	• Only use USB 2.0 or 3.x hi-speed hubs with separate power supply.

10. Cleaning

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

11. Support/Return Hardware

Support

To contact support, go to https://www.hms-networks.com/technical-support.

Return Hardware

1. Open the website mysupport.hms.se.
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 https://www.hms-networks.com/technical-support.
10. Return hardware.

12. Regulatory Compliance

12.1. EU Compliance (CE)

CE

The product is in conformity with essential requirements of the applicable EU directives. More information and the Declaration of Conformity is found at https://www.hms-networks.com.

12.2. FCC Compliance Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

Product name	
Responsible party	HMS Industrial Networks Inc
Address	35 E. Wacker Dr, Suite 1700 Chicago , IL 60601
Phone	+1 312 829 0601

IMPORTANT

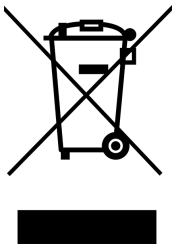
Any changes or modifications not expressly approved by HMS Industrial Networks could void the user's authority to operate the equipment.

IMPORTANT

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

12.3. 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/sustainability.