Ixxat® BY HMS NETWORKS

CANnector Log

USER MANUAL

4.01.0091.21000 1.1 en-US ENGLISH

HMS Connecting Devices™

Important User Information

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Table of Contents

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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, LIN, and the applicable national standards. 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
IxAdmin Online Help	HMS
ACT Installation Manual	HMS
Installation Guide *CANnector*	HMS

1.3 Document History

Version	Date	Description
1.0	October 2020	First release
1.1	November 2020	Minor corrections, added pin allocation power connector and supported formats

1.4 Trademark Information

1.5 Conventions

Instructions and results are structured as follows:

- ► instruction 1
- ► instruction 2
  - → result 1
  - → result 2

Lists are structured as follows:

- item 1
- item 2

Bold typeface indicates interactive parts such as connectors and switches on the hardware, or menus and buttons in a graphical user interface.

```
This font is used to indicate program code and other
kinds of data input/output such as configuration scripts.
```

This is a cross-reference within this document: *Conventions, p. 4*

This is an external link (URL): www.hms-networks.com

Safety advice is structured as follows:

> **!** Cause of the hazard!
>
> Consequences of not taking remediate action.
>
> How to avoid the hazard.

Safety signs and signalwords are used dependent on the level of the hazard.

This is additional information which may facilitate installation and/or operation.

> **!** This instruction must be followed to avoid a risk of reduced functionality and/or damage to the equipment, or to avoid a network security risk.

> **Caution**
> This instruction must be followed to avoid a risk of personal injury.

> **WARNING**
> This instruction must be followed to avoid a risk of death or serious injury.

2 Safety Instructions

2.1 Information on EMC

> **!** Risk of interference to radio and television if used in office or home environment! The product is a class A device.
>
> Use exclusively included accessories or HMS accessories that are intended for use with the device. 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.

2.2 General Safety Instructions

- Protect product from moisture and humidity.
- Protect product from too high or too low temperature (see *Technical Data, p. 31*).
- 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.

2.3 Intended Use

CANnector Log is used to log CAN, CAN FD, and LIN communication. The device is intended for installation on standard DIN rail or for use with adhesive feet on an even surface.

3 Scope of Delivery

Included in scope of delivery:

- CANnector Log
- adhesive device feet
- Installation Guide *CANnector*
- power supply connector
- 16 Gbyte USB memory storage device

4 Product Description

With the CANnector Log the communication of the connected busses can be logged. The four provided basic logging configurations, that initializes all 6 CAN interfaces with 125 Kbit/s, 250 Kbit/s, 500 Kbit/s, or 1000 Kbit/s log all received data in csv format. With the ACT configuration tool configurations can be created, that allow for example to log individual messages and individual signals, and to define trigger messages. By default the configuration with 250 Kbit/s is loaded.

4.1 Features

- measurement and analysis platform
- 4 x high speed Classic CAN interfaces
- 2 x CAN FD interfaces
- 1 x Mini USB device interface
- 2 x USB 2.0 host interface
- 1 x 10/100 Base-T Ethernet interface
- 2 x LIN interfaces
- 2 x digital I/Os
- 8 x LEDs, of which 7 are freely configurable
- real-time clock
- 2 D-Sub 9 galvanically isolated (4 kV for 1 s)

4.2 Software for Configuration and Visualization

The CANnector Log provides various possibilities to manage configurations and to read the log data.

Dashboard

With the dashboard, that is accessible via the IP address and a web browser, the state of the CANnector Log and the connected bus systems can be monitored, the different basic configurations can be selected and downloaded to the device, log files can be uploaded to the PC, and data can be visualized.

ACT Tool

The ACT is Windows based and allows the easy creation of configurations via drag and drop. The ACT provides further configuration possibilities (e.g. logging individual messages and signals, define messages as trigger).

IxAdmin

IxAdmin is included in the ACT. With IxAdmin the different basic configurations can be selected, started and stopped and downloaded to the device. Changing baud rate settings and uploading log files to the PC is also possible as well as updating the firmware and managing the connected devices.

5 Installation

5.1 Installing the Software

To connect the CANnector Log to a PC via USB a driver is needed. With installation of the configuration tool ACT the driver is automatically installed.

The ACT tool can be downloaded on www.ixxat.com.

- On www.ixxat.com/technical-support/support select **Advanced Configuration Tool** and open **Secured Downloads**
- Download the ACT tool ZIP container from the support area.

> ! To be able to download the ACT, a valid e-mail address must be submitted.

- Unpack the ZIP container in a user defined folder on the local drive.
- Execute the included installation file *Ixxat ACT Setup w.x.yyy.z CM.exe*.
  → ACT setup assistant is started.
- Follow instructions in ACT setup assistant.
  → When installation is finished, ACT and IxAdmin are installed.
  → Required USB driver for configuration is installed.

5.2 Installing the Hardware

The device can be installed on a grounded 35 mm DIN rail or used with the adhesive feet on an even surface.

5.2.1 Installing on DIN Rail

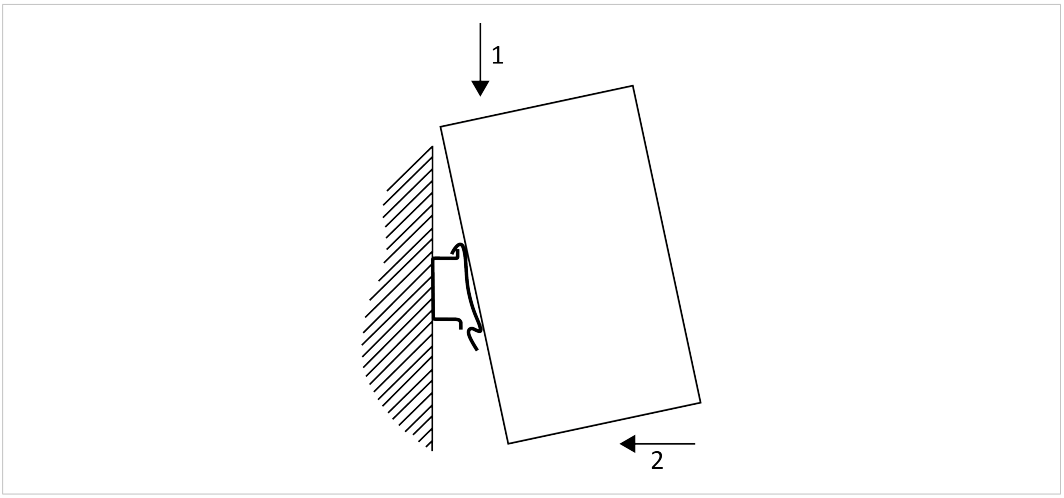


Fig. 1 Installing on din rail

- Hook the din rail clip onto the upper lip of the rail and push the device downwards (**1**).
- Push the device towards the rail until it snaps into place (**2**).
- Make sure, that the venting slots are not covered and ensure adequate air circulation (recommended mounting distance: 2 cm distance to venting slots).

5.2.2 Installing the Adhesive Feet

- Stick the adhesive feet to the bottom of the device.
- Place the CANnector on an even surface.
- Make sure, that the venting slots are not covered and ensure adequate air circulation (recommended mounting distance: 2 cm distance to venting slots).

5.3 Connecting the Device

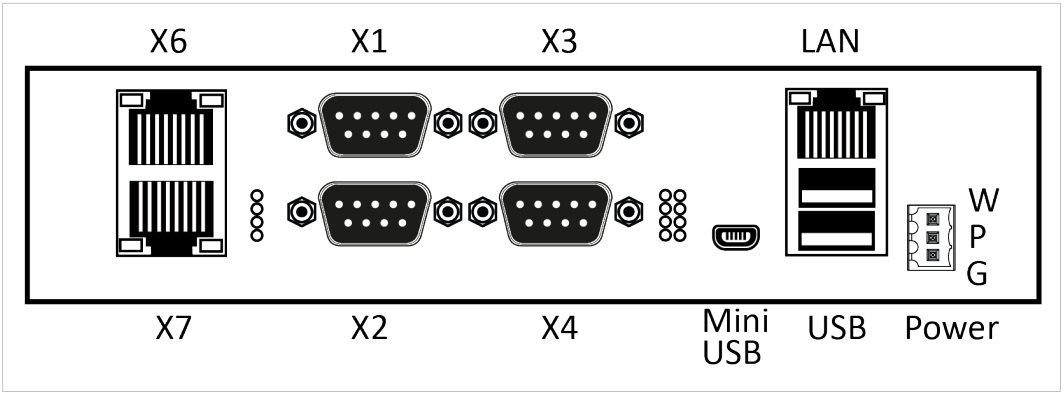


Fig. 2 CANnector front connectors

Pin Allocation Power Connector		
Pin	**Signal**	**Description**
1	G	Ground
2	P	Permanent power supply to provide power in standby mode (+6 to +36 V DC)
3	W	Input to switch on the device (wake up)

For more information about the interfaces, the detailed pin allocations, available accessories, and the LEDs see Installation Guide *CANnector*.

- Make sure, that the software is installed (see *Installing the Software, p. 7*).
- Connect the three pins of the power supply connector (**W**, **P**, and **G**) with the power supply. A ready to use power cable is available as accessory from HMS Industrial Network.
- Connect the CAN interfaces X1 to X4 to be used.
- If required integrate a bus termination in the CAN connection.
- Connect the bus termination to the cable and/or to the connector.
- Use suitable cable assemblies for the CANnector Log, available from Ixxat.
- Plug in the USB memory storage device.
- Use only FAT32 or NTFS formatted USB memory storage devices.
- Switch on the power supply.

  → Default configuration with 250 Kbit/s starts automatically.

> **!** The logging only starts if the USB memory storage device is plugged in correctly.

6 Reading the Log Data

The log data can be read in different ways:

- manually from the USB memory storage device (see *Reading the Log Data Manually, p. 10*)
- in the dashboard (see *Reading the Log Data in the Dashboard, p. 10*)
- with IxAdmin (see *Reading the Log Data with IxAdmin, p. 11*)

Memory formats MDF4, BLF, CSV, and canAnalyser[binary] are supported. Data formats DBC, ARXML, LDF, and Fibex are supported.

6.1 Structure of the Log File

> **!** Excel changes format of the log file while saving! To read the log file in Excel, import the file to Excel and make sure that each column is formatted as text.

The log file can be opened with a text editor or imported to Excel. The name of the log file contains the date and the time of the start of the logging in the format year/month/day and hour/minute/second (Log_yymmdd_hhmmss.csv, e.g Log_200727_130506.csv).

The log file and the logged messages get a timestamp on the basis of the real time clock of the CANnector Log. Due to handling reasons the log file is limited to two Gbyte. If the logging exceeds this size, a further log file with respective name according to the date/time format is created. If the memory of the storage device is full, the oldest log file is deleted. USB storage devices of any size can be used.

	A	B	C	D	E	F	G	H	I	J	K
1	Bus	No	Time (abs)	State	Channel	Cycle	ID (hex)	Length	Message	Data (hex)	ASCII
2	Event Tool	1	1.831.423.532.702					1		11	Recording starts
3	CAN 2	2	1.831.436.743.671				12c	8		00 00 00 00 00 00 00 00	
4	CAN 1	3	1.831.436.762.398				12c	8		30 00 00 00 00 00 00 00	
5	CAN 1	4	1.831.498.644.392				64	8		00 00 00 00 00 00 00 00	
6	CAN 2	5	1.831.498.664.554				64	8		00 00 00 00 00 00 00 00	
7	CAN 1	6	1.831.499.114.493				65	8		00 00 00 00 00 00 00 00	
8	CAN 2	7	1.831.499.170.776				65	8		00 00 00 00 00 00 00 00	
9	CAN 1	8	1.831.499.675.341				c8	8		00 00 00 00 00 00 00 00	
10	CAN 2	9	1.831.499.691.988				c8	8		00 00 00 00 00 00 00 00	
11	CAN 1	10	1.831.500.132.654				190	8		00 00 00 00 00 00 00 00	
12	CAN 2	11	1.831.500.190.978				190	8		00 00 00 00 00 00 00 00	
13	CAN 1	12	1.831.542.538.570				12d	8		00 00 00 00 00 00 00 00	
14	CAN 2	13	1.831.542.986.387				12d	8		00 00 28 00 00 00 00 00	
15	CAN 1	14	1.831.598.467.534				64	8		00 00 00 00 00 00 00 00	
16	CAN 2	15	1.831.598.516.907				64	8		00 00 00 00 00 00 00 00	
17	CAN 1	16	1.831.598.962.665				65	8		00 00 00 00 00 00 00 00	
18	CAN 2	17	1.831.599.034.907				65	8		00 00 00 00 00 00 00 00	
19	CAN 1	18	1.831.599.559.271				c8	8		00 00 00 00 00 00 00 00	
20	CAN 2	19	1.831.599.573.856				c8	8		00 00 00 00 00 00 00 00	
21	CAN 1	20	1.831.599.980.826				190	8		00 00 00 00 00 00 00 00	

Fig. 3 Log file

Column	Description
Bus	Bus that received the message
No	Continuous number of the logged messages
Time (abs)	Absolute time since the last boot of the device (format: s.ms.µs.ns)
State/Channel/Cycle	Not relevant for CAN, CAN FD, and LIN
ID (hex)	Message ID
Length	DLC of the CAN message
Data (hex)	Payload of the message
ASCII	Help text in ASCII (optional)

6.2 Reading the Log Data Manually

- Disconnect the CANnector Log from power supply.
- Unplug the USB memory storage device.
- To read the logging data, plug the USB memory storage device in a PC.

6.3 Reading the Log Data in the Dashboard

With the WiFI extension for the CANnector Log the log data can be read wireless via smartphone or tablet.

- Make sure, that the required software is installed (see *Installing the Software, p. 7*).
- Use the USB cable (included in the scope of delivery) to connect the Mini USB connector of the CANnector Log to the PC.
- Open a web browser on the PC.
- Enter the IP address 169.254.254 as URL.

  → CANnector Log dashboard is opened.

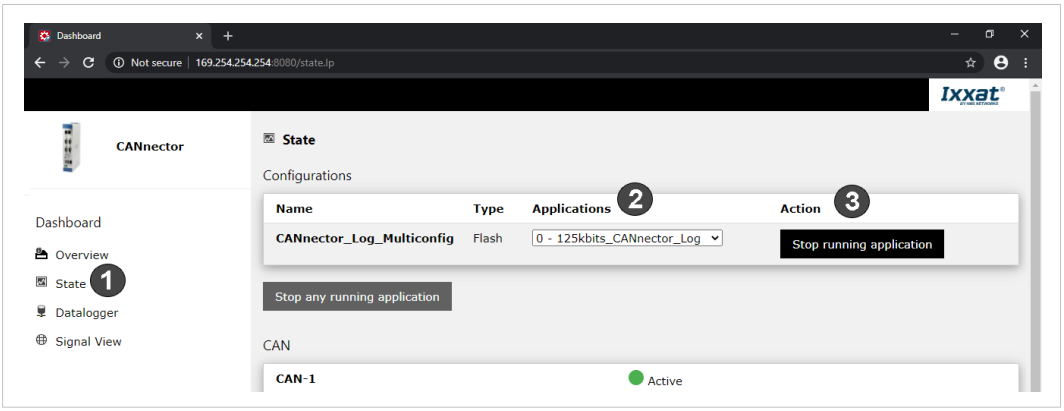


Fig. 4 Dashboard state of application

- Select **State** (**1**) in the configuration tree.

  → State of configuration and CAN ports is shown.
- Click button **Stop running application** in column **Action** (**3**).
- Select **Datalogger** in the configuration tree.

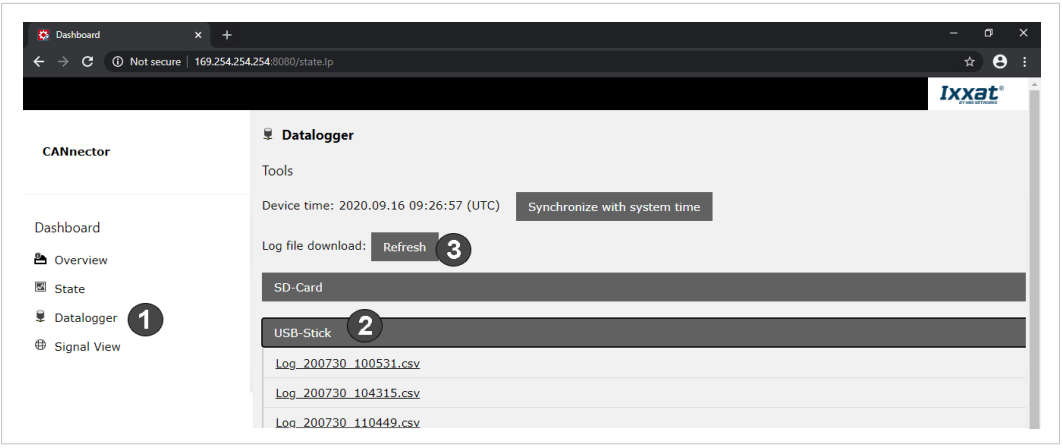


Fig. 5 Dashboard datalogger

- Select **USB Stick** (**2**).

  → Log files are shown.

- If current log file is not shown in the list, click button **Refresh** (**3**) to update the list.
- To download a log file, click on the desired log file.
- To start the logging again, in configuration tree select **State**, select the desired application and click button **Start Selected Application**.

6.4 Reading the Log Data with IxAdmin

IxAdmin is a configuration tool for all CANnector devices. With IxAdmin the log data can be transferred to a PC.

- Make sure, that the required software is installed (see *Installing the Software, p. 7*) and that the CANnector Log is connected (see *Connecting the Device, p. 8*).
- Use the USB cable (included in the scope of delivery) to connect the Mini USB connector of the CANnector Log to the PC.
- Start IxAdmin on the PC.

  → Window **Connect Device** is opened.

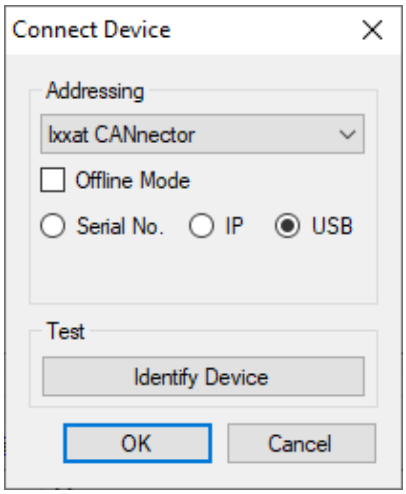


Fig. 6 IxAdmin

- Select **Ixxat CANnector** and **USB**.

It is possible to access the device via Ethernet or when combined with a WiFi extensions it is possible to access the device wireless.

► Click button **OK**.

→ Connection to CANnector is established.

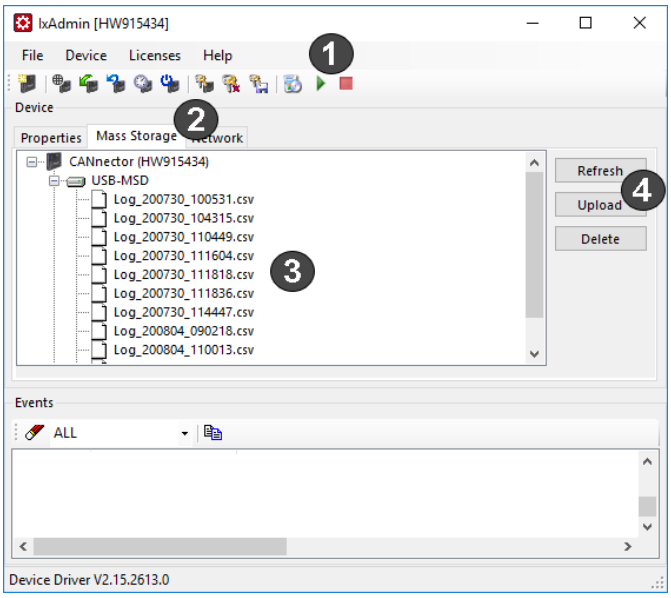


Fig. 7 IxAdmin log files

► Click button **Stop** (**1**) to stop the logger configuration.

► Open tab **Mass Storage** (**2**).

→ Log data that is stored on USB memory storage device is shown (**3**).

► To download a file to the PC, select the file and click button **Upload** (**4**).

► To start the logging again, click button **Start**.

→ A new log file is created.

7 Configuration

By default the CANnector Log starts with a CAN logging configuration that initializes all 6 CAN interfaces with 250 Kbit/s and logs all received messages in csv format. To change the baud rate of all CAN interfaces to 125 Kbit/s, 500 Kbit/s, or 1000 Kbit/ another pre-configured configuration can be selected with the dashboard (see *Selecting a Configuration with Different Baud Rate, p. 13*). With IxAdmin, it is possible to set specific baud rates for individual interfaces in the pre-configured configurations (see *Setting a Specific Baud Rate, p. 14*).

For further configuration possibilities a new configuration can be created or a default configuration can be modified with the ACT tool (see *Creating New Configurations, p. 18*).

7.1 Pre-Configured CAN Logging Configurations

7.1.1 Selecting a Configuration with Different Baud Rate

By default the configuration with 250 Kbit/s is loaded. To use another pre-configured configuration with another baud rate for all CAN interfaces, the configuration can be selected in the dashboard via a web browser.

- Make sure, that the required software is installed (see *Installing the Software, p. 7*) and that the CANnector Log is connected (see *Connecting the Device, p. 8*).
- Use the USB cable (included in the scope of delivery) to connect the Mini USB connector of the CANnector Log to the PC.
- Open a web browser on the PC.
- Enter the IP address 169.254.254.254 as URL.

  → CANnector Log dashboard is opened.

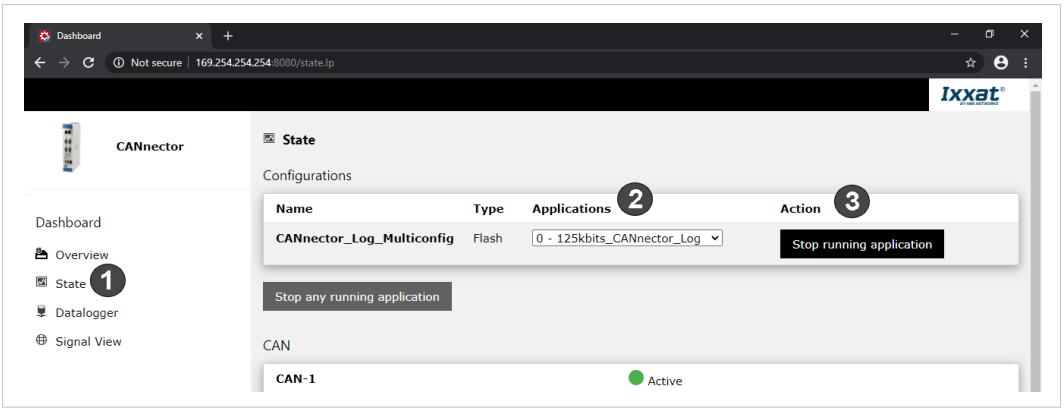


Fig. 8 CANnector dashboard

- Select **State** (**1**) in the configuration tree.

  → State of configuration and CAN ports is shown.
- Click button **Stop running application** in column **Action** (**3**).
- In drop-down menu in column **Application** (**2**) select the desired baud rate.
- Click button **Start selected application** in column **Action** (**3**).

  → Application with selected baud rate is running.

  → Configuration starts automatically for the selected baud rate.

After a power cycle the last selected configuration is automatically started.

7.1.2 Setting a Specific Baud Rate

With IxAdmin it is possible to set an individual baud rate for each CAN bus or a specific baud rate (e.g. 666 kBit/s) without creating a new configuration.

- Make sure, that the required software is installed (see *Installing the Software, p. 7*) and that the CANnector Log is connected (see *Connecting the Device, p. 8*).
- Use the USB cable (included in the scope of delivery) to connect the Mini USB connector of the CANnector Log to the PC.
- Start IxAdmin on the PC.

  → Window **Connect Device** is opened.

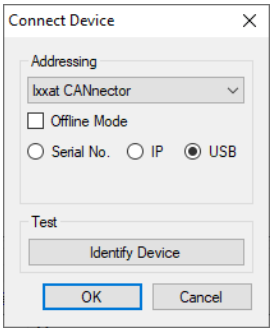


Fig. 9 IxAdmin

- Select **Ixxat CANnector** and **USB**.
- Click button **OK**.

  → Connection to CANnector is established.

  → IxAdmin is opened and the properties of the connected device are displayed.
- Open menu **Device** and select **Add/Remove Application**.

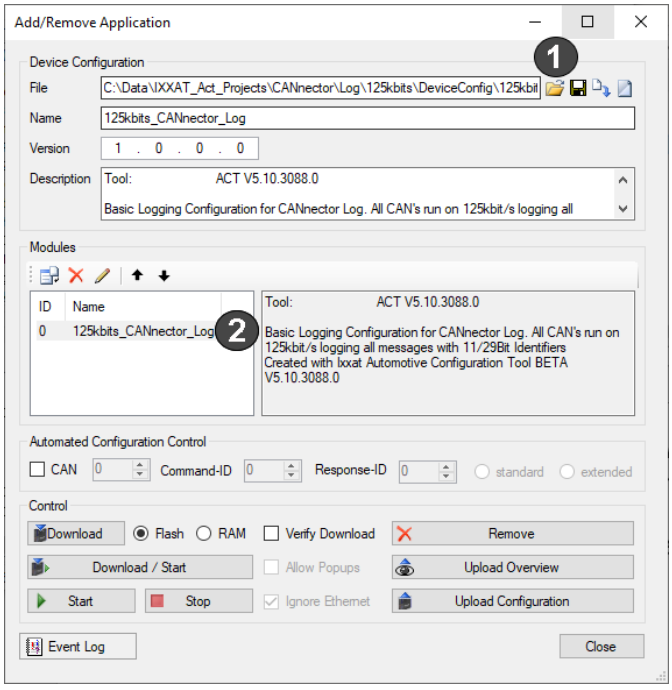


Fig. 10 IxAdmin Add/Remove Application

- ► Click on button **Open folder** (**1**).
- ► Select a pre-configured basic configuration (sdcfg file) and click button **Open**.

The sdcfg file is the download project file of a configuration, that contains all links to all files that are required for one configuration.

→ Selected pre-configured basic configuration is opened.

- ► Double-click on the configuration in window **Modules** (**2**).

→ Window to configure the application is opened.

→ Available CAN controllers are listed in field **Bus controllers**.

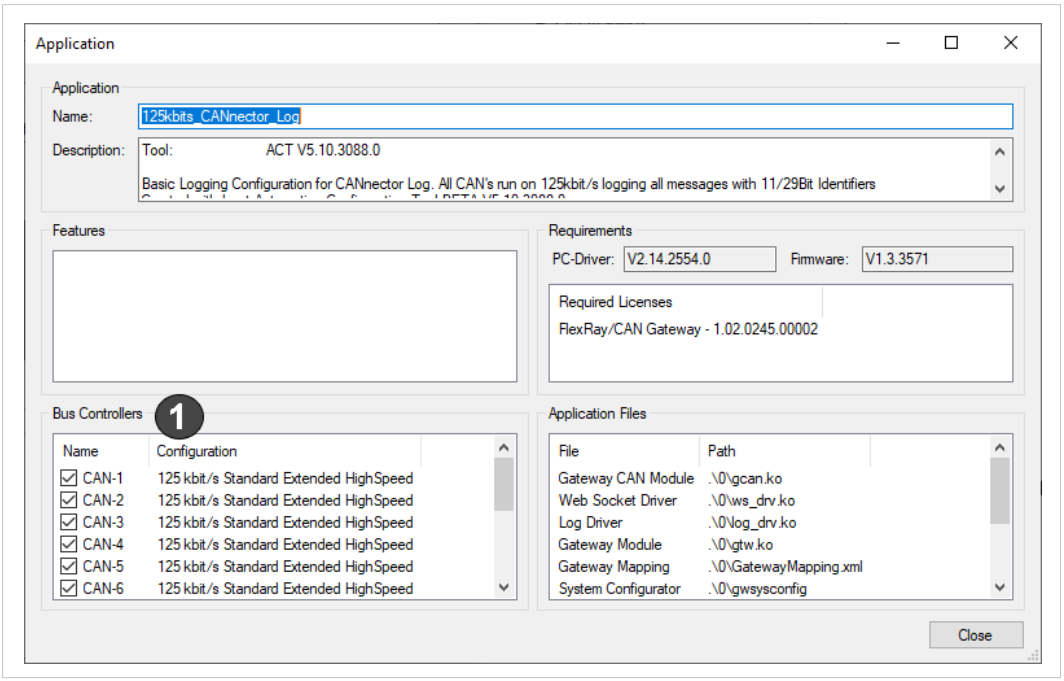


Fig. 11 Configure the controller

- ► In field **Bus Controllers** (**1**) select the desired CAN controller and right-click on the desired controller.

→ Window to edit the controller is opened.

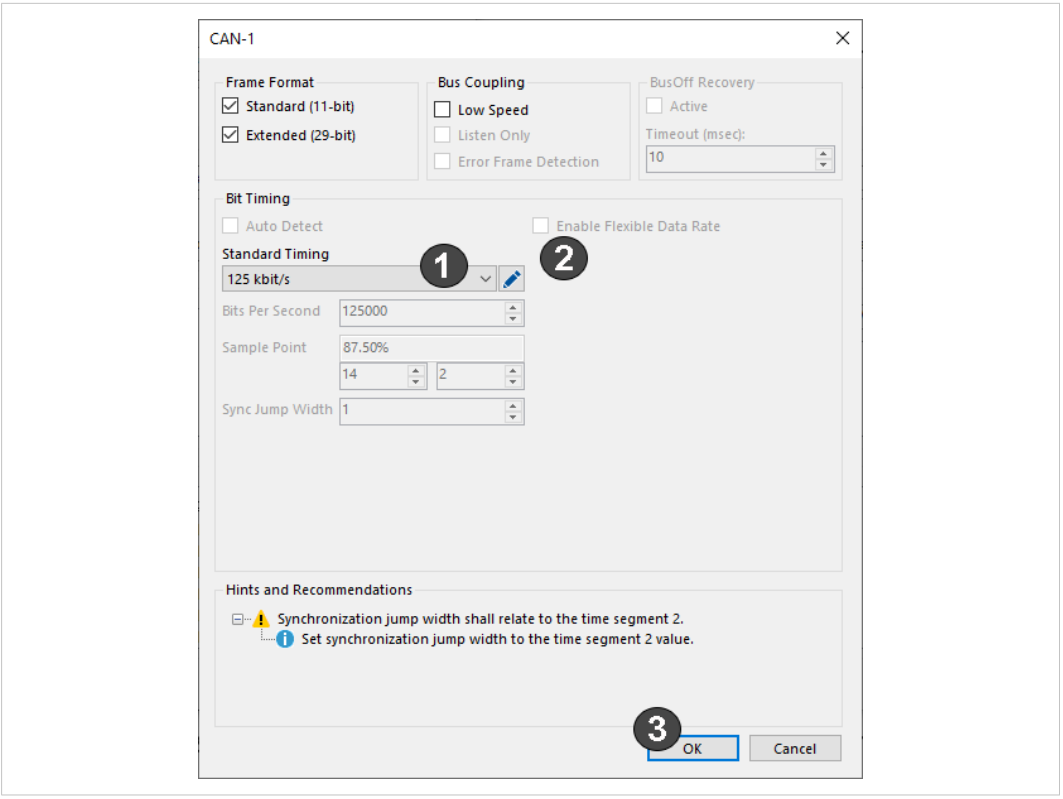


Fig. 12 IxAdmin Edit Baud rate of CAN controller

- Select the desired baud rate in drop-down menu **Standard Timing** (**1**).
- To enable CAN FD with CAN 5 and CAN 6, activate **Enable Flexible Data Rate** (**2**) to be able to set the Standard baud rate and the Fast Timing baud rate for CAN FD.
- To assign the selected baud rate to the controller, click button **OK** (**3**).
- To close the window **Application**, click button **Close**.

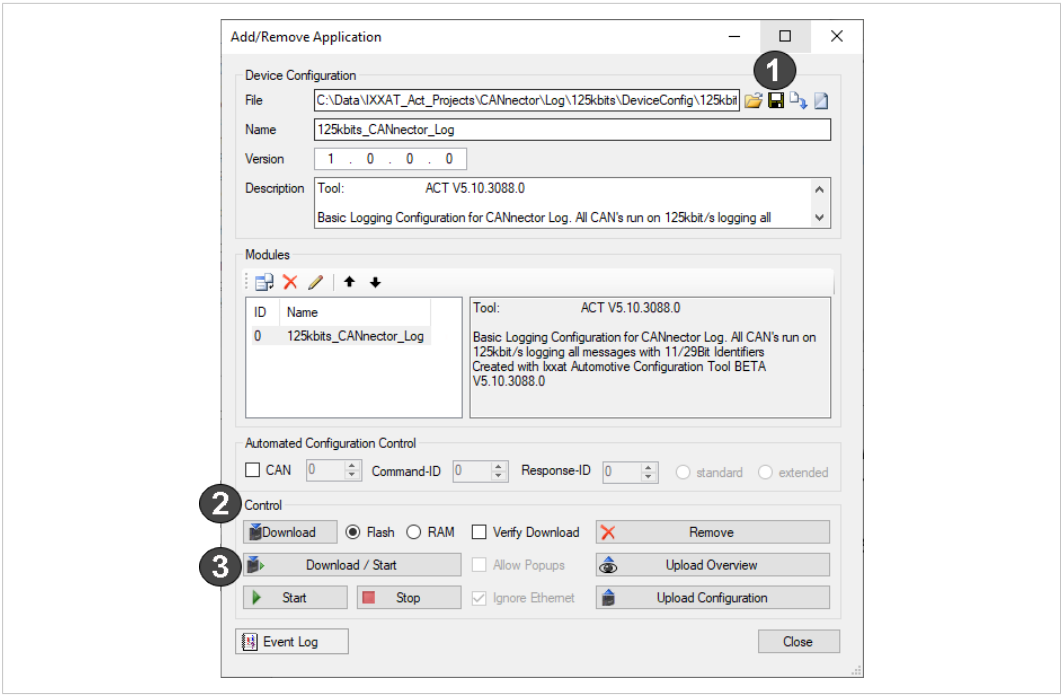


Fig. 13 Save application

- In window **Add/Remove application** save the configuration with button **Save** (**1**).
- In field **Control** (**2**) define the memory the configuration is downloaded to:
  - Select Flash for the non-volatile memory of the target device. Configurations which are downloaded to the Flash memory, are automatically started at the next power-on of the device.
  - Select RAM for the volatile memory of the target device. Configurations which are installed in the RAM memory are lost when the device is switched off.
- To start the configuration on the CANnector Log, click button **Download/Start** (**3**).

7.2 Creating New Configurations

To use more functions of the CANnector Log, logger configurations can be created with the freeware ACT tool. Basically two logger configuration types can be created: logger without bus description files (log messages) and logger with bus description files (log individual signals).

For example the following functions can be used with the CANnector Log:

- logging of defined messages of a CAN bus
- trigger on defined messages
- import bus description files for the CAN busses
- trigger on signal values
- log to a ring buffer and log when a trigger occurs (with the possibility of a pre-trigger)

7.2.1 Creating a Configuration without Bus Description File

Logger configurations without bus description files provide the possibility to log complete messages and to trigger for defined messages as well as excluding individual messages from logging.

► Make sure, that the required software is installed (see *Installing the Software, p. 7*) and that the CANnector Log is connected (see *Connecting the Device, p. 8*).

► Start the ACT tool.

► Open menu **File** and select **New**.

→ Wizard to create a new logger project is opened.

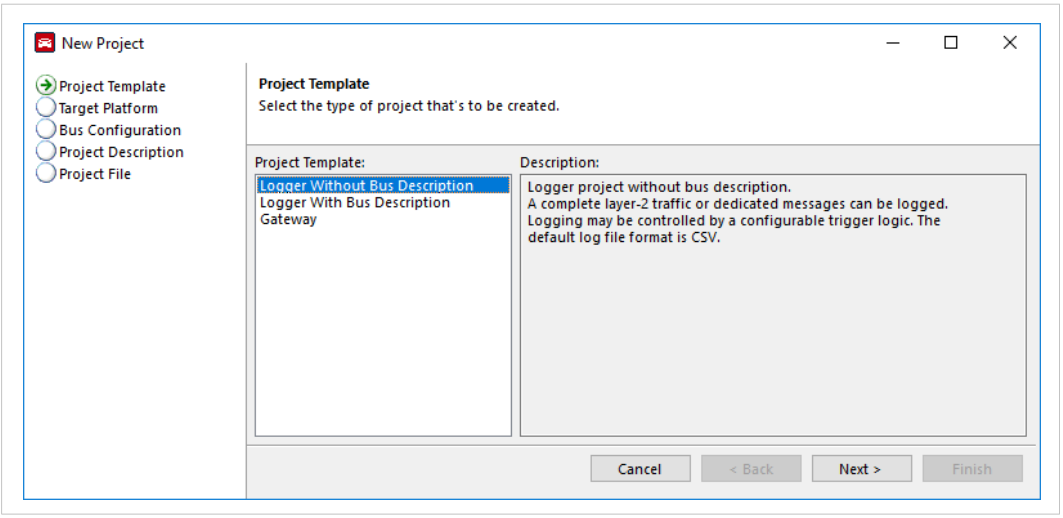


Fig. 14 ACT wizard

► Select the project template **Logger without Bus Description** and click button **Next**.

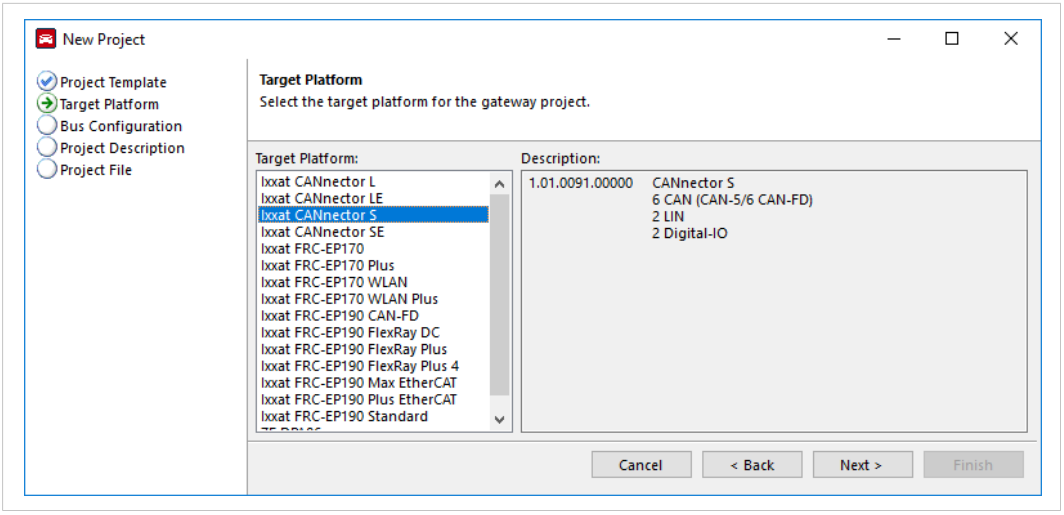


Fig. 15 ACT wizard

► Select target platform **Ixxat CANnector S** and click button **Next**.

The CANnector Log is based on the CANnector S.

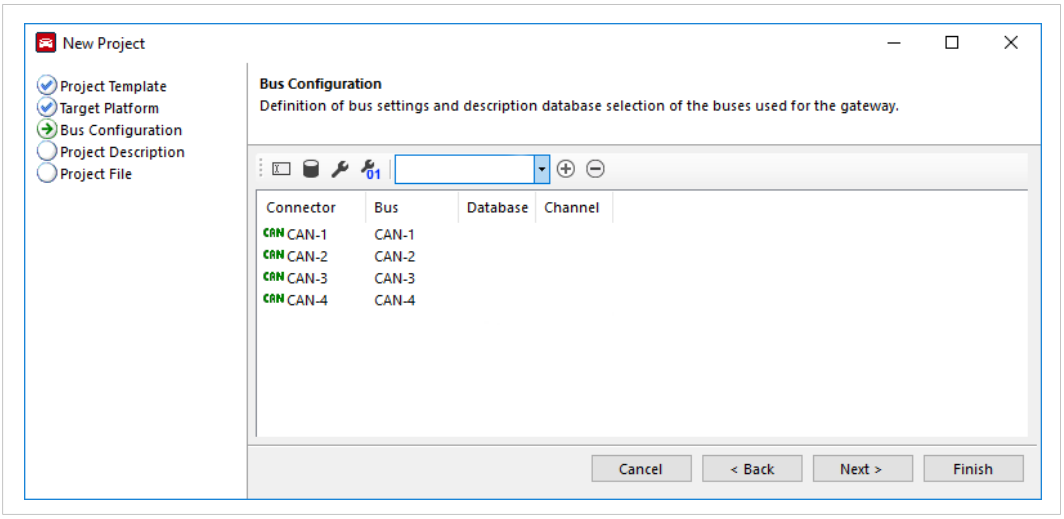


Fig. 16 Bus configuration

► To set the baud rate of the CAN busses, click button and select the desired baud rate. For CAN 5 and CAN 6 CAN FD can be enabled.

► Click button **Next**.

► Name the project and define the path where the project is stored.

► Click button **Next**.

→ Window to configure the logger is opened.

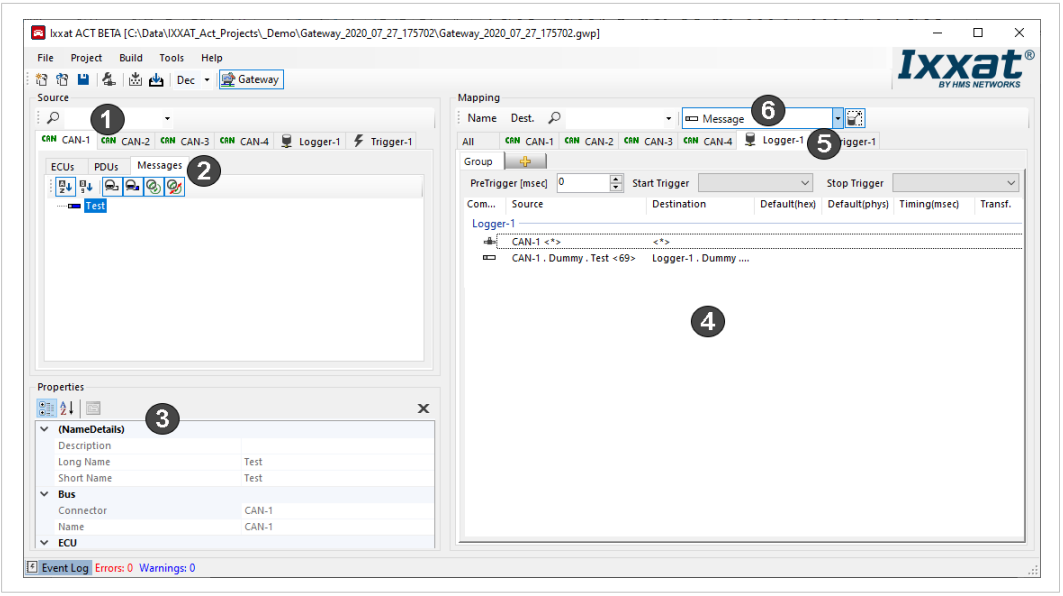


Fig. 17 Logger configuration window

- ► Select the desired CAN bus as source (**1**) and the tab **Logger** (**5**) as destination.
- ► In **Source** (**1**) open tab **Message** (**2**).
- ► In drop-down list **Map Subject** select **Message** (**6**).
- ► To log an entire CAN bus (wildcard mapping), drag and drop the tab of the desired CAN bus from source (**2**) to destination logger (**4**).

---

*To exclude individual messages, define individual messages, map the messages in the destination logger, right-click on the message and select **Exclude**.*

- ► To log individual messages, define the message and drag and drop the message from source (**2**) to destination logger (**4**).

- To define an individual message:
  - Right-click in source field (**2**) and select **New Message** in the context menu.
    → Window to define a message is opened.

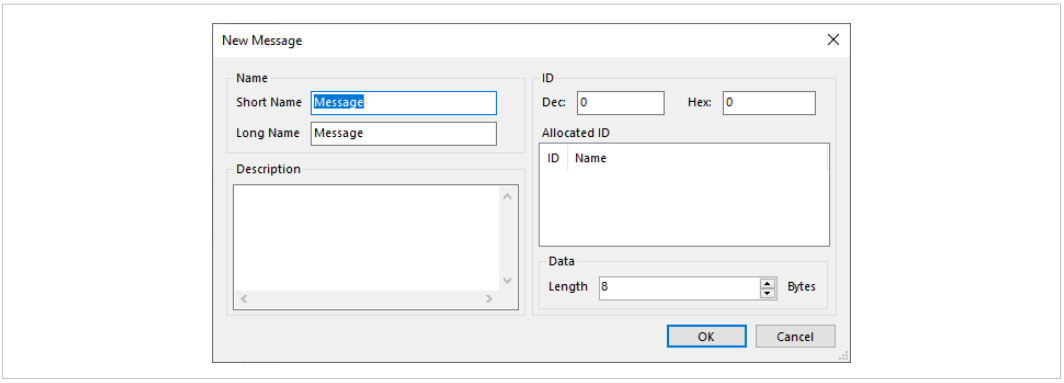


Fig. 18 Configure new message

  - Create the desired message and click button **OK**.
    → In the source field message and message properties are shown (**3**).
  - To log the message, drag and drop the created message from source (**2**) to destination logger (**4**).

*Several messages can be selected and dragged and dropped simultaneously. To exclude individual messages, right-click on the message and select **Exclude**.*

- If desired messages can be used as trigger (see *Using Messages as Trigger, p. 21*).
- When the logger configuration is finished, open menu **Build** and select **Build** to produce the logger configuration.
- To load the logger configuration to the device, open menu **Build** and select **Download**.
  → IxAdmin is started.
- Load the logger configuration with IxAdmin to the CANnector Log (see *Loading Configurations to the Device, p. 28*).

7.2.2 Using Messages as Trigger

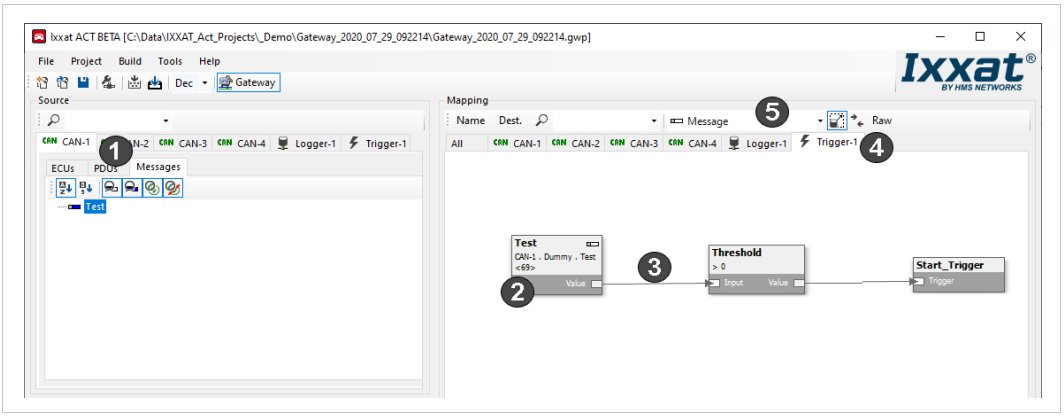


Fig. 19 Trigger when message Test is received

- In source (**1**) select the CAN bus to be logged and select tab **Messages** (**1**).
- In drop-down list **Map Subject** select **Message** (**5**)

- ► Select tab **Trigger** (**4**) as destination.
- ► Drag and drop the desired trigger message from source (**1**) to destination trigger (**4**).
  → Mapped message is the input signal (**2**).
- ► To define the logic, right-click in the trigger window.
  → Menu with possible function blocks is opened:

Function block	Description
New trigger signal	Output of the trigger engine, can be used in the logger to start/stop the recording or being mapped to any other signal of the configuration.
New clock	Can be used as input for the trigger engine, intended to start the logging at a certain time/day based on the realtime clock of the CANnector.
New counter	Used as a counter, that counts down every time an input event is available (for example an input trigger signal). Can be used for example to start the logger only after a certain count of events.
New debouncing	Delays the output signal a certain amount of time after having received a input signal.
New flipflop	Stores a certain sporadic event, for example to keep it available for a later comparison.
New threshold	Compares the input signal with a certain value. A threshold is needed for every trigger input signal. In case of a message as trigger input signal, the comparison should be greater than 0.
New timer	Delays the output for a definable amount of time, can be used for example to stop the recording after a specified period of time after the start.
New OR, XOR, AND, NOT	Can be used for logical comparison of two input signals.

- ► Add the desired function blocks to the trigger window.
- ► Connect the logic with drag and drop (**3**).

As minimum a threshold higher than 0 and a trigger signal are needed. For example to stop the logging after a certain time, add a timer and a further trigger. The various function blocks can be combined freely. Several messages can be used as input signal and several trigger outputs can be created.

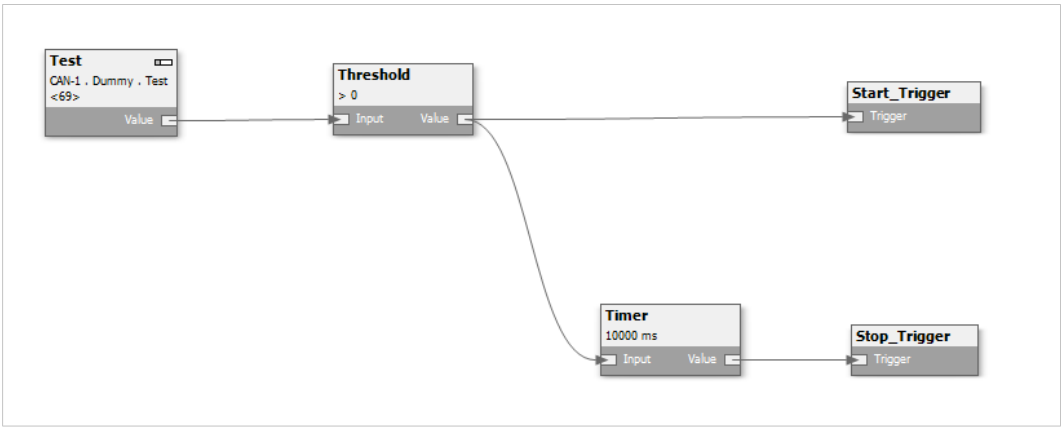


Fig. 20 Example for timer to stop the trigger

► To add the trigger logic to the logger configuration, open the tab **Logger** and select the created trigger signals in fields **Start Trigger** (**1**) and **Stop Trigger** (**2**).

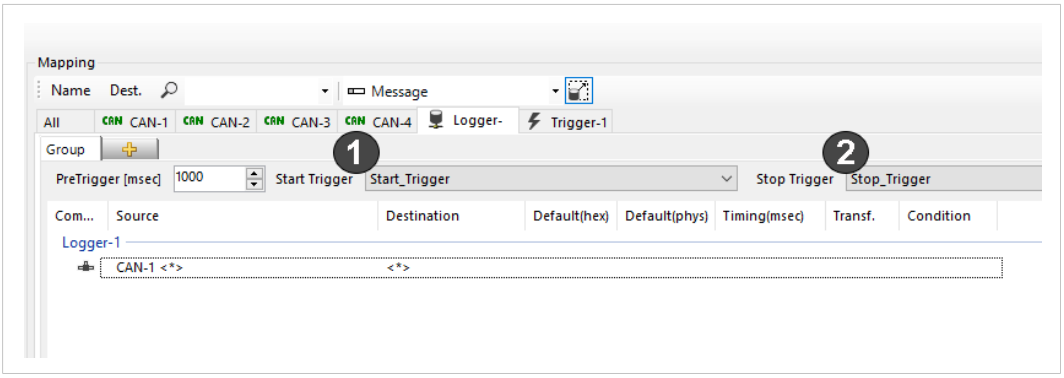


Fig. 21 Add trigger logic to logger configuration

► To start the logging before the trigger, define a **PreTrigger** time.

→ Data is written to a ring buffer and in case of the trigger, the messages are traced back for the specified time and the logging is started from that point of time.

7.2.3 Creating a Configuration with Bus Description File

With the ACT CAN and CAN FD bus description files (e.g. in CANdB format) can be assigned to the respective CAN busses. Bus description files allow access to the signals and the possibility to log individual signals (instead of complete messages) as well as the possibility to use signal values (e.g. a defined engine speed) on a physical layer (e.g. 2500 rpm instead of 24 hex) as trigger. Log files for configuration with bus description files are stored in MDF format.

► Make sure, that the required software is installed (see *Installing the Software, p. 7*) and that the CANnector Log is connected (see *Connecting the Device, p. 8*).

► Start the ACT tool.

► Open menu **File** and select **New**.

→ Wizard to create a new logger project is opened.

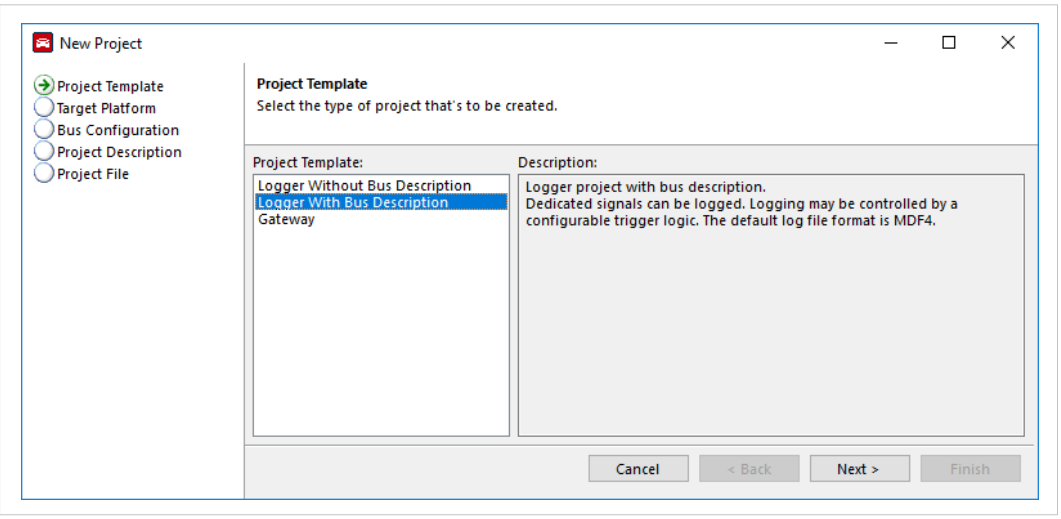


Fig. 22 ACT wizard

- Select the project template **Logger with Bus Description** and click button **Next**.

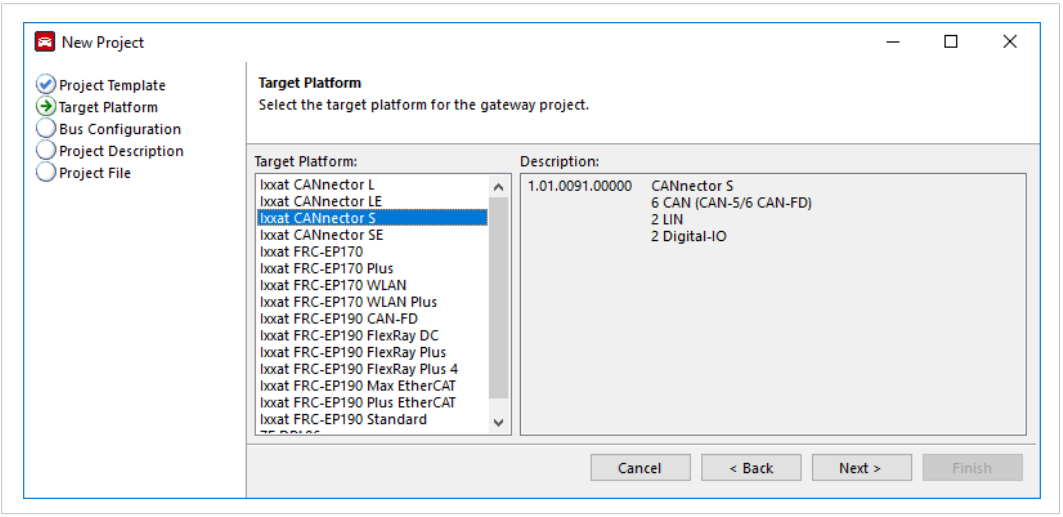


Fig. 23 ACT wizard

- Select target platform **Ixxat CANnector S** and click button **Next**.

The CANnector Log is based on the CANnector S.

- To assign bus description files to the CAN busses, select the desired CAN bus (**3**) and click the data base button (**1**).

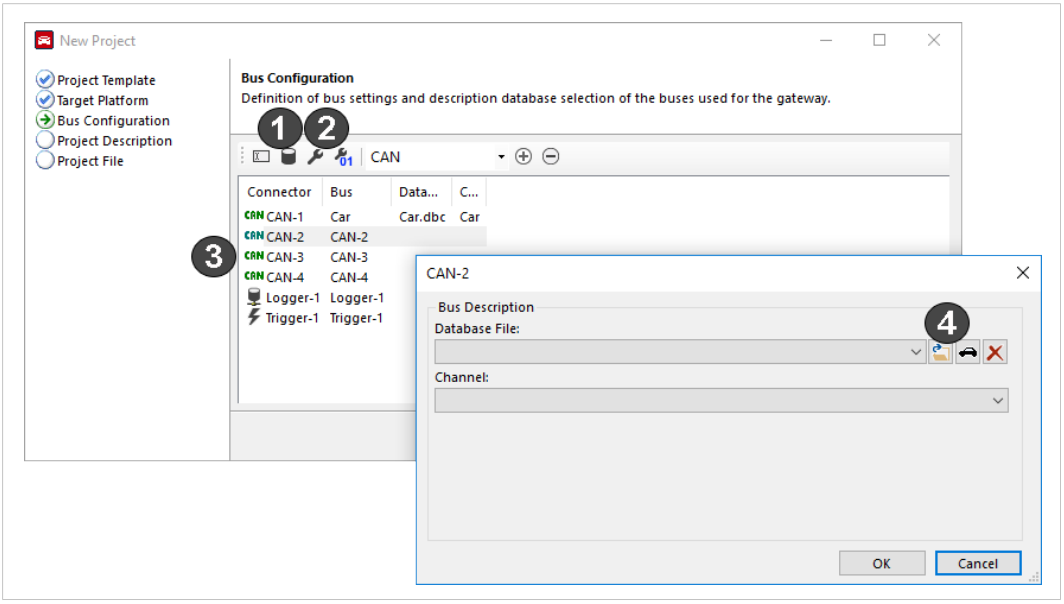


Fig. 24 Assign database

- Click button **Open** (**4**) to select a CAN database.
- Click button **OK** to assign the data base.
- To set the baud rate of the CAN busses, click button **Settings** (**2**) and select the desired baud rate. For CAN 5 and CAN 6 CAN FD can be enabled.
- Click button **Next**.
- Name the project and define the path where the project is stored.

► Click button **Next**.

→ Window to configure the logger is opened.

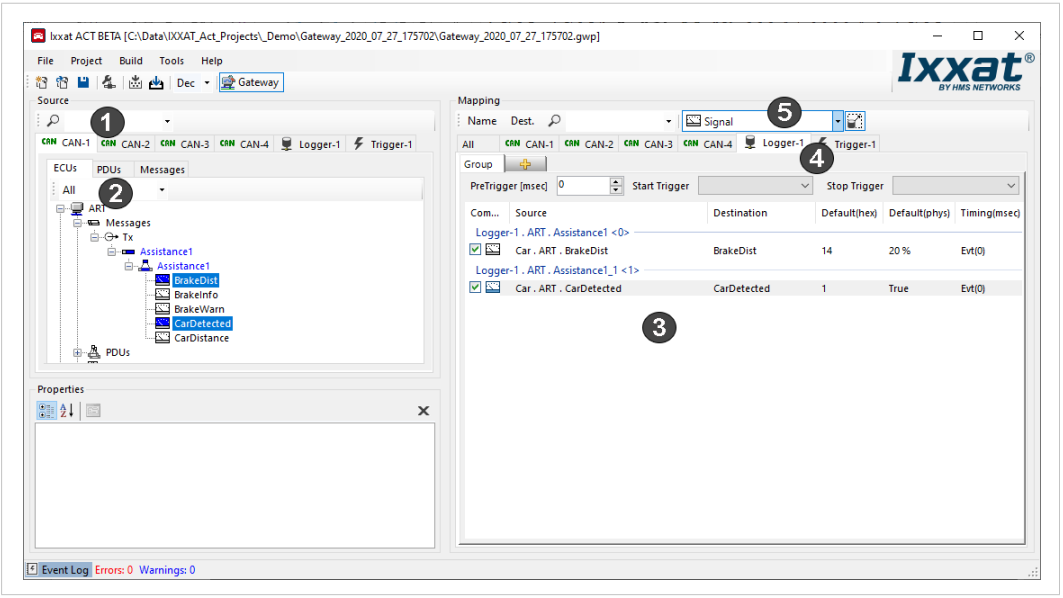


Fig. 25 Logger configuration window

► Select the desired CAN bus as source (**1**) and the tab **Logger** (**4**) as destination.

► In source open tab **ECUs** (**2**).

► In drop-down list **Map Subject** select **Signal** (**5**)

► To log individual signals, drag and drop the data to be logged from source (**2**) to destination logger (**3**).

→ By default, signals are logged event triggered: when a signal is received, the signal is logged.

► To log a signal only in defined intervals, right-click the mapped signal on logger destination (**3**) and select **Timing**.

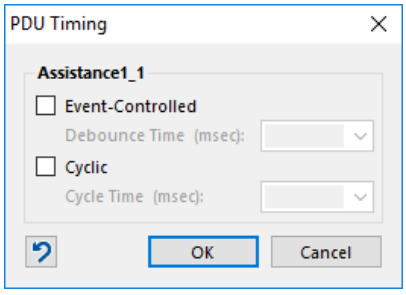


Fig. 26 Defining interval

► To log the signal in defined cycles, select **Cyclic** and define the cycle time.

► To define a debouncing time for a signal (next signal is only logged if the defined time is exceeded), select **Event-Controlled** and define the debounce time.

► An individual interval can be selected for each mapped signal.

► If desired use signals as trigger (see *Using Signals as Trigger, p. 26*).

► When the logger configuration is finished, open menu **Build** and select **Build** to produce the logger configuration.

- ► To load the logger configuration to the device, open menu **Build** and select **Download**.
  → IxAdmin is started.
- ► Load the logger configuration with IxAdmin to the CANnector Log (see *Loading Configurations to the Device, p. 28*).

7.2.4 Using Signals as Trigger

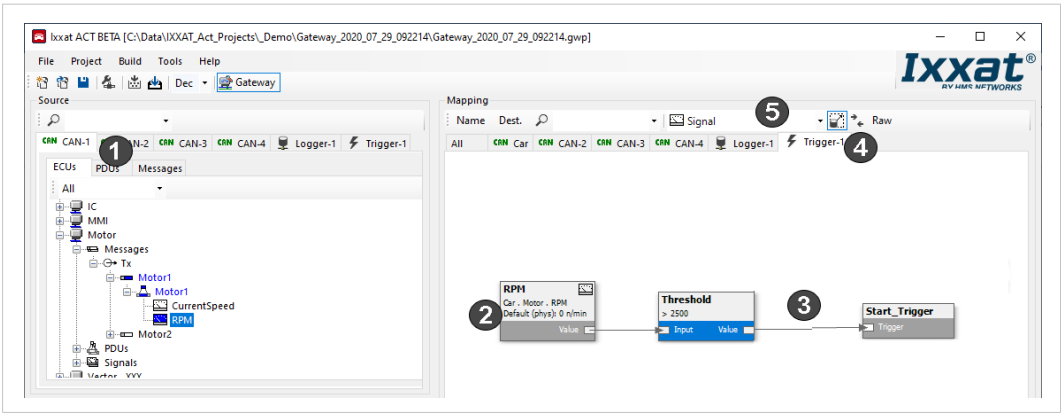


Fig. 27 Trigger when message Test is received

- ► In source (**1**) select the CAN bus to be logged and select tab **ECUs** (**1**).
- ► In drop-down list **Map Subject** select **Signal** (**5**)
- ► Select tab **Trigger** (**4**) as destination.
- ► Drag and drop the desired trigger signal from source (**1**) to destination trigger (**4**).
  → The mapped signal is the input signal (**2**).
- ► To define the logic, right-click in the trigger window.
  → Menu with possible function blocks is opened:

Function block	Description
New trigger signal	Output of the trigger engine, can be used in the logger to start/stop the recording or being mapped to any other signal of the configuration.
New clock	Can be used as input for the trigger engine, intended to start the logging at a certain time/day based on the realtime clock of the CANnector.
New counter	Used as a counter, that counts down every time an input event is available (for example an input trigger signal). Can be used for example to start the logger only after a certain count of events.
New debouncing	Delays the output signal a certain amount of time after having received a input signal.
New flipflop	Stores a certain sporadic event, for example to keep it available for a later comparison.
New threshold	Compares the input signal with a certain value. A threshold is needed for every trigger input signal. In case of a message as trigger input signal, the comparison should be greater than 0.
New timer	Delays the output for a definable amount of time, can be used for example to stop the recording after a specified period of time after the start.
New OR, XOR, AND, NOT	Can be used for logical comparison of two input signals.

- ► Add the desired function blocks to the trigger window.

► Connect the logic with drag and drop (**3**).

As minimum a threshold and a trigger function block are needed (the threshold is given on physical level). To stop the logging after a certain time, for example, add a timer and a further trigger. The various function blocks can be combined freely. Several messages can be used as input signal and several trigger outputs can be created.

*To change the properties of a trigger function block, right-click on the function block and select **Properties** (e.g. the default value of the input signal).*

► To add the trigger logic to the logger configuration, open the tab **Logger** and select the created trigger signals in fields **Start Trigger** (**1**) and **Stop Trigger** (**2**).

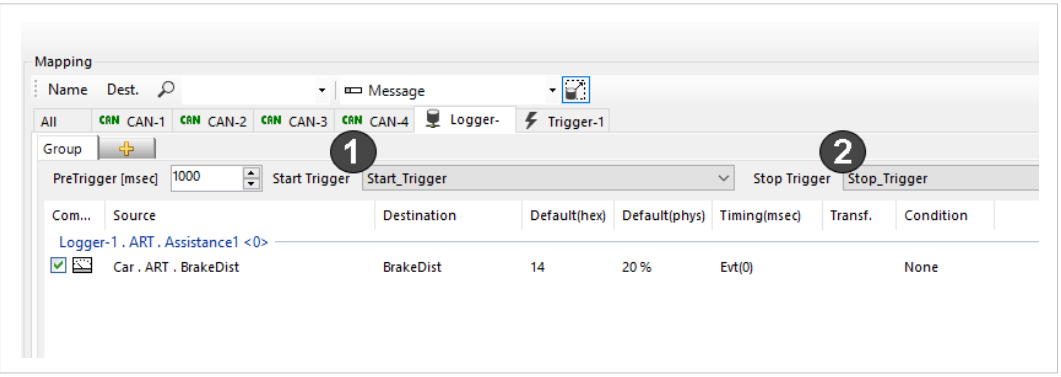


Fig. 28 Add trigger logic to logger configuration

► To start the logging before the trigger, define a **PreTrigger** time.

→ Data is written to a ring buffer and in case of the trigger, the messages are traced back for the specified time and the logging is started from that point of time.

7.2.5 Loading Configurations to the Device

- Make sure, that the required software is installed (see *Installing the Software, p. 7*) and that the CANnector Log is connected (see *Connecting the Device, p. 8*).
- Start IxAdmin.

  → Window **Connect Device** is opened.

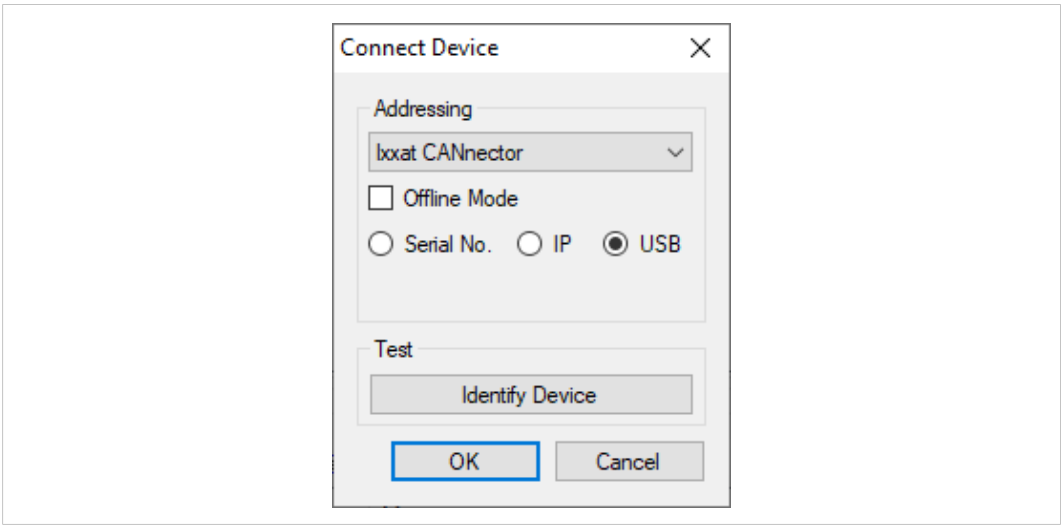


Fig. 29 IxAdmin

- Use the USB cable (included in the scope of delivery) to connect the Mini USB connector of the CANnector Log to the PC.

It is possible to access the device via Ethernet or when combined with a WiFi extensions it is possible to access the device wireless. For more information see ACT Help.

- Select **Ixxat CANnector** and **USB**.
- Click button **OK**.

  → Connection to CANnector is established.

► Open menu **Device** and select **Add/Remove Application**.

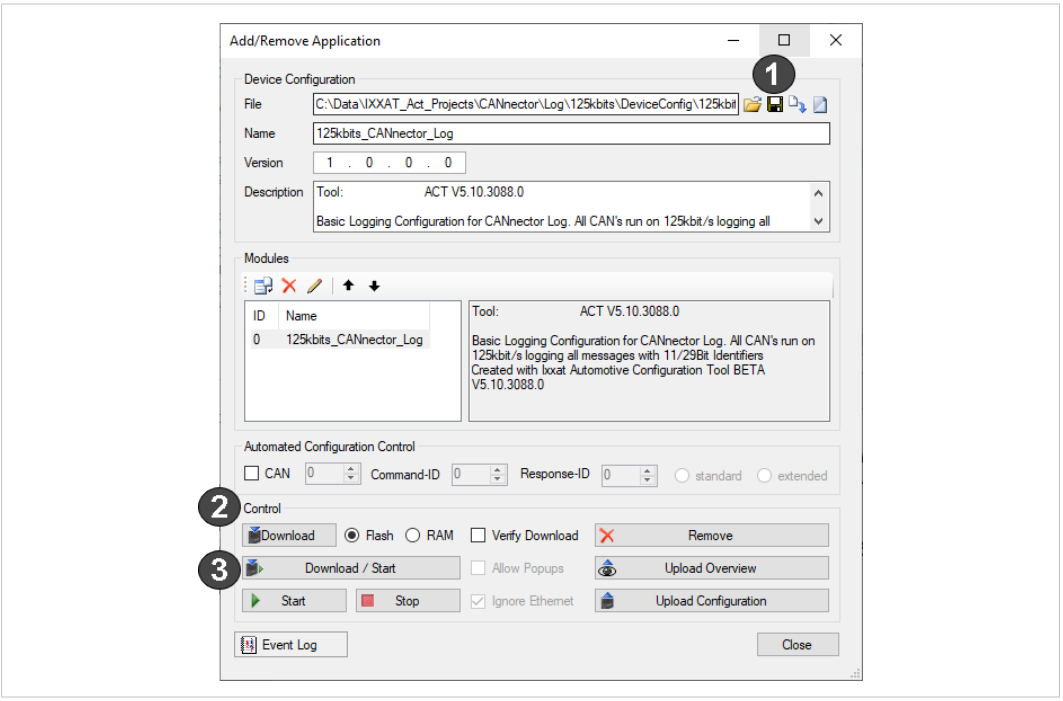


Fig. 30 IxAdmin CANnector configuration

► Click button **Open folder** (**1**).

► Select the created configuration (sdcfg file) and click button **Open**.

→ Selected configuration is opened.

► Save the configuration with button **Save** (**1**).

► In field **Control** (**2**) define the memory the configuration is downloaded to:

– Select Flash for the non-volatile memory of the target device. Configurations which are downloaded to the Flash memory, are automatically started at the next power-on of the device.

– Select RAM for the volatile memory of the target device. Configurations which are installed in the RAM memory are lost when the device is switched off.

► To start the configuration on the CANnector Log, click button **Download/Start** (**3**).

7.3 Configuring Further Functions

The CANnector Log can additionally be used as Gateway/Bridge, to manipulate data, and to visualize data. When combined with a WiFi or LTE extensions it is possible to access the device wireless from the cloud or to configure the device to send logging data to a server in the cloud.

The following further functions can be configured with the ACT tool:

FDX	Fast Data Exchange	Standardized protocol to exchange data via Ethernet
GenEthernet	Virtual CAN interfaces on Ehternet	Ixxat protocol to transmit CAN busses via Ethernet, allows to represent Range Extender applications (see *User Manual CANnector Range*)
IO	Digital I/Os	Allows to use the Digital I/Os of the CANnector Log (e.g. to trigger the logger or to switch on a light)

MatLab	MatLab/Simulink models	Possibility to calculate signals with a Simulink model that runs on the CANnector Log
OPC	OPC-UA	Standardized protocol for data exchange with a cloud
System	System bus	Contains all status signals of all used bus systems, e.g. CAN bus status
Usercode	C code extension of the configuration	Possibility to extend the configurations with C code, e.g. to implement a complex trigger engine or to calculate signals (see *User Manual CANnector Bridge*)
Virtual	Define own signals	Possibility to define signals, e.g. to count via usercode how often a certain event happens
WebSock	Data visualization/stimulation	Signals that are mapped to this bus, can be visualized and stimulated with the web browser
XCP	XCPonEthernet	Standardized protocol to exchange data via Ethernet

- To additional functions to the configuration, in the ACT tool open menu **Project — Bus configuration**.

  → Window **Bus Configuration** is opened.

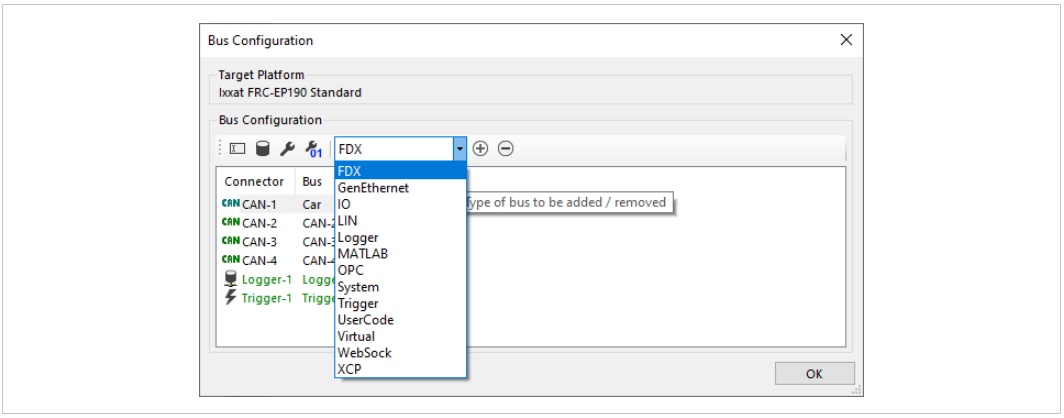


Fig. 31 Bus Configuration

- Open drop-down menu and select the desired function.
- Click button **Add (+)** to add the selected function.

  → Module is added to the configuration.
- For information about the configuration of the additional functions see *ACT Help*.

8 Technical Data

Basic Unit	
Dimensions (L x W x H)	196 x 113 x 43 mm (without DIN rail bracket and device feet)
Weight	790 g
Operating temperature	-40 °C to +80 °C
Storage temperature	-40 °C to +85 °C
Power supply	6-36 V DC
Current consumption	Typ. 420 mA at 12 V
Housing material	Aluminium, stainless steel
Relative humidity	10-95 %, non-condensing
Host system	Power PC, 256 MByte RAM, 256 MByte Flash
Ethernet	10/100 MBit/s, RJ45
USB	2.0 high-speed device, USB-B 2.0 high-speed device, USB-A
CAN transceiver high-speed	Texas Instruments SN65HVD251
CAN-FD transceiver	Microchip MCP2562FD
CAN bus termination resistor	None
CAN signal delay with galvanic isolation:	Typ. 27 ns
LIN transceiver	Microchip MCP2003B
System startup time	< 5 sec from power-on

9 Support/Return Hardware

9.1 Support

- For problems or support with the product request support at www.ixxat.com/support.
- If required use support phone contacts on www.ixxat.com.

9.2 Return Hardware

- Fill in the form for warranty claims and repair on www.ixxat.com/support/product-returns.
- Print out the Product Return Number (PRN resp. RMA).
- Pack product in a physically- and ESD-safe way, use original packaging if possible.
- Enclose PRN number.
- Observe further notes on www.ixxat.com.
- Return hardware.

10 Disposal

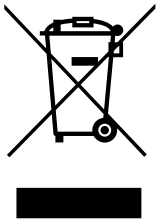
- Dispose of product according to national laws and regulations.
- Observe further notes about disposal of products on www.ixxat.com.

A Regulatory Compliance

A.1 EMC Compliance (CE)

The product is in compliance with the Electromagnetic Compatibility Directive. More information and the Declaration of Conformity is found at www.ixxat.com.

A.2 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.

B Open Source Software

The software of the Ixxat CANnector Log contains software components that are licensed as Free Software or Open Source Software by the rights holders. The corresponding licenses are available on the support area of the CANnector Log on www.ixxat.com. (Included in Firmware Download Package as well as included in Offline Help Package). You may obtain the complete corresponding source code of the software components from us on a data carrier and within three years as of the distribution of the software by us or at least for as long as we offer support and spare parts for the software, if you make a request to HMS Industrial Networks AB at the following address:

HMS Industrial Networks AB
Box 4126
SE-300 04 Halmstad
Sweden

The source code is also available at the support area of the CANnector Log on www.ixxat.com.

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