



## INICnet™ 50utp Sniffer



ISBN: 978-1-5224-5071-9

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## Chapter 1 Preface

### 1.1 Intended Use

The INICnet™ 50utp Sniffer is intended to be used for developing, testing, or analyzing automotive products and systems by persons with experience in developing automotive devices in an INICnet 50utp network.

### 1.2 Scope of Delivery

The delivery covers the following:

- INICnet 50utp Sniffer
- UTP cable
- USB cable
- Power cable
- Wall power supply (optional)
- Software, user's guide per download from web site: <http://www.K2L.de>.
- SYNC cable V3 (optional, required for time synchronization)

Check your shipment for completeness. If you have any objections, direct them to [Sales@K2L.de](mailto:Sales@K2L.de). Providing the delivery note number eases the handling.

### 1.3 Definitions of Terms

For better understanding of the following chapters, this section provides explanation to special terms used in the description of the INICnet 50utp Sniffer user manual.

**Table 1.1 Definitions of Terms**

TERM / ABBREVIATION	DESCRIPTION
LAN	Local Area Network
EDF	Ethernet Data Frame
SYNC	Time synchronization
USB	Universal Serial Bus
UTP	Unshielded twisted pair

## 1.4 Legal Notice

The INICnet 50utp Sniffer firmware uses a modified Linux kernel. The Linux kernel is licensed under the GPLv2.0 license. The source code of the Linux kernel used for the INICnet 50utp Sniffer is available upon request ([Sales@K2L.de](mailto:Sales@K2L.de)).

The INICnet 50utp Sniffer firmware uses a modified U-Boot. The U-Boot is licensed under the GPLv2+ license. The source code of the U-Boot used for the INICnet 50utp Sniffer is available upon request ([Sales@K2L.de](mailto:Sales@K2L.de)). The GPLv2.0 license can be found at the following link: <https://www.gnu.org/licenses/old-licenses/gpl-2.0.txt>

The INICnet 50utp Sniffer firmware uses the GNU libstdc++ Library which is licensed under the GPLv3 license with the GCC Runtime Library Exception, version 3.1. The GPLv3.0 license can be found at the following link: <https://www.gnu.org/licenses/old-licenses/gpl-3.0.txt>

The GCC Runtime Library Exception, version 3.1 can be found at the following link: <https://gcc.gnu.org/onlinedocs/libstdc++/manual/license.html>

The INICnet 50utp Sniffer firmware uses the GNU C Library which is licensed under the LGPLv2.1 license.

The INICnet 50utp Sniffer firmware uses the libusb-neXt (libusb-gx) library which is licensed under the LGPLv2.1 license. The LGPLv2.1 license can be found at the following link: <https://www.gnu.org/licenses/old-licenses/lgpl-2.1.txt>

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3 Foxglove Close, Wokingham, Berkshire RG41 3NF, UK  
[david.rusling@digital.com](mailto:david.rusling@digital.com)

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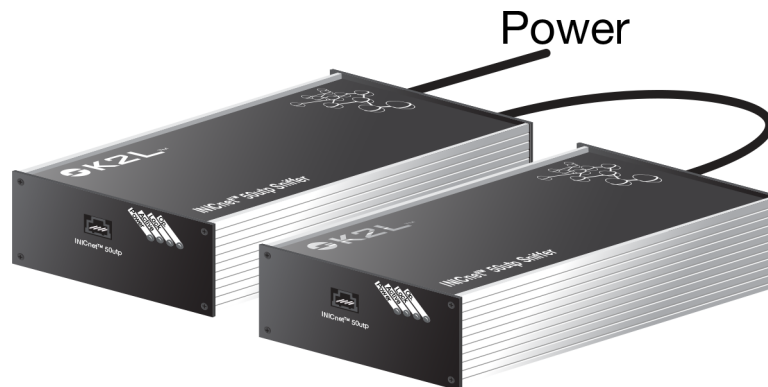
## Chapter 2 Definitions Limit Class

### 2.1 Supply and Time Synchronization

When concatenating two INICnet 50utp Sniffers one of the two Sync/Power connectors is intended to be used for the power supply and the other for cascading the INICnet 50utp Sniffer by using the optional SYNC cable V3.

During cascading, caution has to be taken, since the Binder's current limitation is 4 A. Do not cascade more than **two** devices in chain with one power supply.

**Figure 2.1 Power Supply and Time Synchronization**



### 2.2 Emission

The INICnet 50utp Sniffer has passed the requirements according to the standard EN 55022:2010, class A.

#### **Warning**

The INICnet 50utp Sniffer is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

## Chapter 3 Introduction

The INICnet 50utp Sniffer is a device developed to be inserted into an INICnet 50utp network in order to spy the entire communication going over the network.

The INICnet 50utp Sniffer is equipped with a network port (RX and TX) on the front panel providing a connection to an INICnet 50utp network and with a USB connector on the rear panel used to connect the device to a client PC. The sniffed data is transferred to the PC for further analysis and presentation ([Section 3.2, "Block Diagram," on page 9](#)).

The device supports time synchronization as master and slave. In addition, a standalone mode is implemented. OptoLyzer MOCCA compact family devices connected via a SYNC cable V3 are also supported referring to the time synchronization.

### 3.1 Feature Summary

The following list covers the key features of the hardware platform.

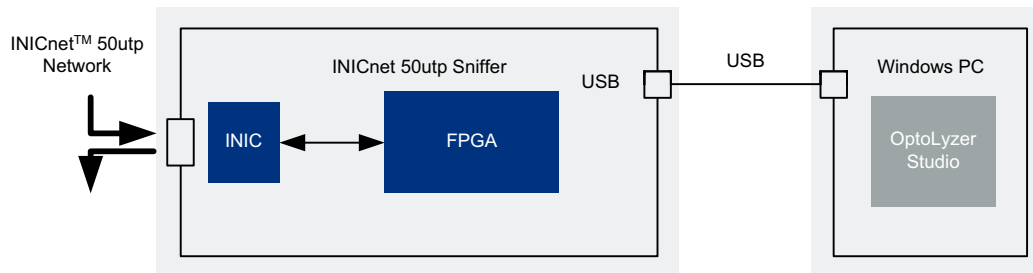
- Full INICnet 50utp network spy
  - Control, EDF, Packet Frame
  - Synchronous and isochronous streams
  - Visible Nodes / NPR event
  - Lock / unlock event
  - Signal / no signal event
  - Allocation data event
- One network port (RX and TX)
- One USB 2.0 port supporting High-Speed with 480 Mbit/s
- 4 status LEDs
- 12 V power forwarding via the Sync connector
- Time synchronization with other cascaded devices of the OptoLyzer MOCCA family (over SYNC cable V3)
- Synchronization accuracy: 1  $\mu$ s at a timestamp resolution of 100 ns



## 3.2 Block Diagram

The block diagram shows the principle structure of a typical environment of the INICnet 50utp Sniffer.

**Figure 3.1 Block Diagram**



The INICnet 50utp Sniffer is inserted into an INICnet 50utp network. The entire traffic on the network is sniffed via its INICnet 50utp Sniffer connector. The sniffed data is preprocessed on the tool and then transferred to the PC over an USB port. On the PC, the data can be visualized with the OptoLyzer Studio software. This means that all the comprehensive analysis, like filters, will be available right away which means the user can see what is happening on the network and judge if everything is working properly respectively identifying mistakes, problems and issues.

## Chapter 4 Hardware Interfaces

The following sections describe all hardware interfaces.

### 4.1 Front Panel

The hardware interfaces are described from left to right.

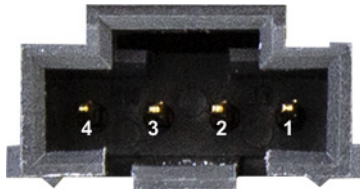
**Figure 4.1 Front Panel**



#### 4.1.1 INICnet 50utp Sniffer Connector

The device is equipped with an INICnet 50utp Sniffer connector.

**Figure 4.2 PIN Assignment of the INICnet 50utp Sniffer Connector**



Connector type: Molex SL 70551-0038 series, 4 pins

Suitable counter-piece: Molex 50-57-9404 plus contact pin 16-02-0087

**Table 4.1 Pins of the INICnet 50utp Sniffer Connector**

PIN	DESCRIPTION	
1	BRX_P	Positive receiver input
2	BRX_N	Negative receiver input
3	BTX_N	Negative transmitter output
4	BTX_P	Positive transmitter output

### 4.1.2 LEDs

The INICnet 50utp Sniffer offers four unicolored LEDs.

**Table 4.2 LEDs**

LED	COLOR	OPERATION MODE	BLINKING MODE	DESCRIPTION
Power	Green		On	The device is powered.
Active	Blue	Bootng	Fast blinking	INICnet 50utp Sniffer is bootng after powering.
		Normal operation	Slowly blinking	Firmware is running.
			Fast blinking (3 s)	Device identification via twinkle function (e.g., in OptoLyzer Studio).
		Flashing	Fast blinking	The device is in flash mode. LED Op. is blinking simultaneously.
Lock	Green		On	The network is in lock state.
Op.	Green	Normal operation	Off	No USB Connection detected.
			On	Connected over USB to the OptoLyzer Studio.
			Blinking	Traffic (LED is not blinking by missing USB connection).
		Flashing	Fast blinking	The device is in flash mode. LED Activity is blinking simultaneously.

## 4.2 Rear Panel

The hardware interfaces are described from left to right.

**Figure 4.3 Rear Panel**



### 4.2.1 USB Connector

The USB port is a standard USB B-type receptacle.

### 4.2.2 LAN Connector

The LAN connector is an RJ45 receptacle according to TIA-568. It supports 1000 Mbit/s and is reserved for internal usage.

### 4.2.3 Sync Connector

Connecting two INICnet 50utp Sniffers via the SYNC cable V3 allows to use both devices with the same time stamp. Refer to [Section 4.2.4, "Power Connector," on page 13](#).

#### 4.2.4 Power Connector

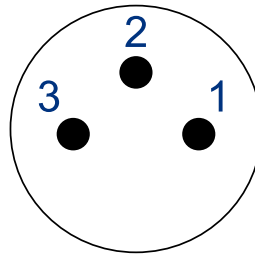
The Sync (time synchronization) and the Power connector have the identical pin assignment i.e., each socket can be used either for time synchronization or power purposes. Restrictions are described in [Section Chapter 2, "Safety Instructions," on page 10](#). The INICnet 50utp Sniffer is intended to be powered by the wall power supply or by any other power supply which is capable to deliver 12 V and at least 1 A. If the wall power supply is not used, the included power cable has to be used to connect the 12 V supply to the INICnet 50utp Sniffer.

Connector type: Binder sensor connector series 768, 3 pole, ordering number: 09 3419 82 03

Suitable female connector: Binder M8 IP40 series 768, 3 pole, ordering number: 99 3400 100 03

[Figure 4.4](#) shows the pins as they are visible on the rear panel for these connectors.

**Figure 4.4 Pin Assignment of the Sync and Power Connector**



**Table 4.3 Pin Assignment of the Sync and Power Connector**

PIN NO.	SIGNAL	DESCRIPTION
1	12 V	Power supply
2	Sync	Synchronization line
3	GND	System ground

#### 4.2.5 Power Switch

The device is powered in top position and switched off in bottom position.

## Chapter 5 Technical Specifications

The table below covers mechanical characteristics of the INICnet 50utp Sniffer.

**Table 5.1 Mechanical Characteristics**

PARAMETER	VALUE	UNIT
Dimensions (H x W x D)	49 x 105 x 242	mm
Weight	660	g
Operating Temperature Range	0..+60	°C

The table below covers electrical characteristics of the INICnet 50utp Sniffer.

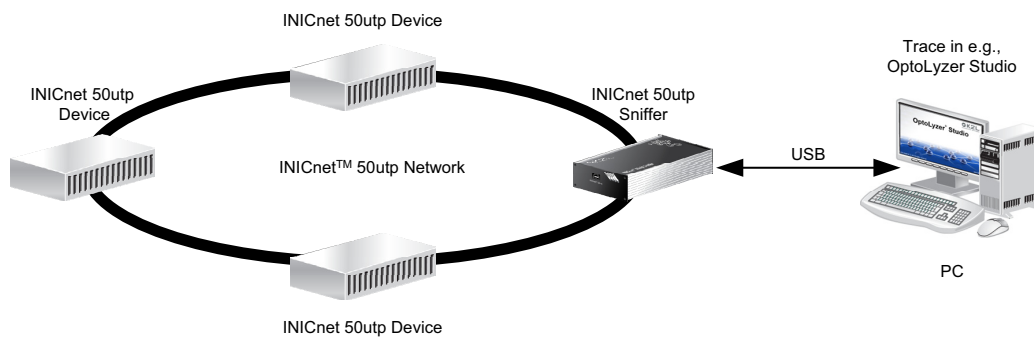
**Table 5.2 Electrical Characteristics**

PARAMETER	MIN	TYP	MAX	UNIT	COMMENT
Operating Voltage Range	10	12	28	V	
Current Consumption (operation)		500		mA	
I <sub>power supply</sub>	1			A	

## Chapter 6 Use Cases

Figure 6.1 shows a simple example how the INICnet 50utp Sniffer can be used. The device is inserted in an INICnet 50utp network where it is spying all data and afterwards transmitting to a connected PC via USB. The OptoLyzer Studio is running on the PC and able to display the sniffed data in a trace, graph etc.

**Figure 6.1 Spying Transmitted Data over the INICnet 50utp Network**



## Chapter 7 Revision History

**Table 7.1 Customer Revision History**

REVISION LEVEL	SECTION/FIGURE/ENTRY	CORRECTION
DS60001569C (09-24-2019)	<a href="#">Section 1.4, "Legal Notice"</a>	INICnet-50utp Sniffer replaced by INICnet 50utp Sniffer
DS60001569B (09-03-2019)	All	Terms MEP, MDP, MPR replaced by Ethernet Data Frame, Packet Frame and Visible Nodes.
DS60001569A (05-28-2019)	Initial Version	



## Further Information

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