

# USB-100BASE-T CONVERTER

# **USER MANUAL**

March 2019

Manual-Version: 2.1.2.

Hardware-Version: 2.2



## Content

1		GE	NER.	AL INFORMATION	3
	1.	1	Fun	ctionality and Features of the USB-100BASE-T1 Converter	3
	1.	2	Wai	ranty and Safety Information	4
2		HA	RDW	/ARE INTERFACES	5
	2.	1	Cor	inectors	5
		2.1	.1	Black MQS Connector	5
		2.1	.2	Universal Serial Bus Connector	6
	2.	2	Oth	er Interfaces	6
		2.2	.1	Status LED	6
3		INS	TAL	LATION	7
	3.	1	Driv	er Installation	7
4		CO	NFIG	SURATION 1	4
	4.	1	NIC	settings (information) 1	6
5		AD	DITI	ONAL INFORMATION	20
6		LIS	t of	FIGURES	21
7		CH	ANG	ELOG 2	22
8		CO	ΝΤΑ	СТ2	23



## **1 GENERAL INFORMATION**

1.1 Functionality and Features of the USB-100BASE-T1 Converter



Figure 1-1: USB-100BASE-T1 Converter

The Technica Engineering USB-100BASE-T1 Converter transmits data frames from the physical layer BroadR-Reach (100BASE-T1) to USB 2.0-LAN.

Features:

- 1 port 100BASE-T1 with Broadcom BroadR-Reach Technology
- 1 port USB 2.0 mini B
- 1 Status LED



#### General Information:

Power requirement:	5V
Power consumption:	2,5 Watt

LINKS:

The User can download the latest firmware and documentation for the USB-100BASE-T1 Converter here:

https://technica-engineering.de/en/produkt/usb-100base-t1-converter/

#### 1.2 Warranty and Safety Information

Before operating the device, read this manual thoroughly and retain it for your reference.

The latest documentation for the USB-100BASE-T1 Converter here:



https://technica-engineering.de/en/produkt/usb-100base-t1converter/



Use the device only as described in this manual. Use only in dry conditions. Do not apply power to a damaged device.



Do not open the device. Otherwise warranty will be lost.





Do not use this device in a series production car.

As this device is likely to be used under rough conditions, warranty is limited to 1 year.

Manufacturer liability for damage caused by using the device is excluded.



## 2 HARDWARE INTERFACES

#### 2.1 Connectors

On the label on top of the device you can see an overview about all HW-Interfaces of the USB-100BASE-T1 Converter.



Figure 2-1: Label of USB-100BASE-T1 Converter with pinning information

### 2.1.1 Black MQS Connector

The pinning of the ECU connectors is listed on the label on top of the device as well. (See FIGURE 2-1)

The Connector color is black.



The Tyco Electronics (TE) Micro Quad Lock System (MQS) is used.

Name	Picture	Part Number
Tyco, MQS Buchsengehäuse 3 Pol		4-1718346-1
Tyco crimp contact	ETE	928999-1

Table 2-1: Parts of black MQS connector

Note: You can use the official Tyco tool for these crimp contacts. A cheap variant is the crimp tool for "PSK" contacts.

Pin	Function
1	n.c.
2	100BASE-T1 port, positive
3	100BASE-T1 port, negative

Table 2-2: Pinning of black MQS connector

### 2.1.2 Universal Serial Bus Connector

There is one USB 2.0 mini B Port for connection to a laptop or PC. Since the chip used is a USB-LAN chip, your PC will identify a new Ethernet Network Interface Card.

#### 2.2 Other Interfaces

#### 2.2.1 Status LED

The USB-100BASE-T1 Converter has one status LED at the frontside of the case for the 100BASE-T1 Port.

It is lit when there is linkup. It is toggling when there is communication.

Note: There is a bug in the used BroadR-Reach PHY. When the BR Plus and Minus lines are swapped, and the 100BASE-T1 port is set to Slave then the Link LED is lit, but there is no data transmission possible. So please ensure that the 100BASE-T1 lines (positive/positive and negative/negative) are connected correctly.



## 3 INSTALLATION

#### 3.1 Driver Installation

A driver is available for following operating Systems (version 1.4):

- Linux x64
- Windows x32
- Windows x64

Download-link

https://technica-engineering.de/en/produkt/usb-100base-t1-converter/

For Windows, please follow the described steps for installation:

- 1) Connect your USB-100BASE-T1 Converter device to your computer
- 2) browse your driver installation data folder and double click on the setup called "USB-BR\_1.4"

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Schnelizugriff     Desktop		USB-BR_1.4	21.02.2019 13:45	WinRAR-Archiv	7.978 KB
Downloads	*	🔀 USB-BR_1.4	21.02.2019 09:21	Anwendung	7.994 KB

Figure 3-1: Driver Installation Data Folder

Accept the prompt to install the application.

3) Follow through the Wizard menus as shown below:





Figure 3-2: Driver Installation Start Up screen



🔂 Setup - USB to BroadR-Reach —	×
License Agreement Please read the following important information before continuing.	
Please read the following License Agreement. You must accept the terms of this agreement before continuing with the installation.	
YOU (THE INDIVIDUAL CLICKING ON THE ACCEPT BUTTON BELOW) FOR YOURSELF OR ANY ENTITY FOR WHOM YOU ARE AN EMPLOYEE OR AGENT AND WHICH OBTAINS THE SOFTWARE MADE THE SUBJECT OF THIS SOFTWARE LICENSE AGREEMENT, AGREE TO THE TERMS AND CONDITIONS OF THIS SOFTWARE LICENSE AGREEMENT (REFERRED TO AS THIS AGREEMENT or "Agreement") BY EITHER (1) CLICKING ON THE "ACCEPT" BUTTON BELOW, OR (2) ACCESSING OR USING ANY OF SUCH SOFTWARE PROGRAMS OR CODE. PLEASE READ THIS AGREEMENT BEFORE CLICKING ON THE "ACCEPT" BUTTON. IF YOU DO NOT AGREE TO THE TERMS OF THIS AGREEMENT, PLEASE DO NOT CLICK ON THE "ACCEPT" BUTTON. BY CLICKING ON THE "ACCEPT" BUTTON BELOW, YOU (THE INDIVIDUAL	*
• I accept the agreement	
○ I do not accept the agreement	
< Back Next > 0	Cancel

Figure 3-3: Driver Installation Terms and Conditions



🔀 Setup - USB to BroadR-Reach	_		×
Select Start Menu Folder Where should Setup place the program's shortcuts?		¢	
Setup will create the program's shortcuts in the following St	art Men	u folder.	
To continue, click Next. If you would like to select a different folder,	click Bro	wse.	
Technica Engineering\USB to BR Converter	Br	owse	
< Back Next	t>	Car	ncel

Figure 3-4: Driver Installation



🔀 Setup - USB to BroadR-Reach —		×
Ready to Install Setup is now ready to begin installing USB to BroadR-Reach on your computer.	G	
Click Install to continue with the installation, or click Back if you want to review change any settings.	or	
Start Menu folder: Technica Engineering\USB to BR Converter	^	
<	>	
< Back Install	Can	cel

Figure 3-5: Driver Installation

4) In case you have an old application running, the installer will prompt to close automatically:



🛃 Setup	· USB to BroadR-Reach	_		×
Prepa Set	ring to Install up is preparing to install USB to BroadR-Reach on your computer		¢	
0	The following applications are using files that need to be update recommended that you allow Setup to automatically close these After the installation has completed, Setup will attempt to resta applications.	ed by Sei applicat art the	tup. It is ions.	
	technica-usb-win		^	
	<		>	
	<ul> <li>Automatically close the applications</li> <li>Do not close the applications</li> </ul>			
	< Back Nex	t >	Car	ncel

Figure 3-6: Driver Installation



🛃 Setup - USB to BroadR-Reach — 🗆 🛛			
	<section-header><text><text></text></text></section-header>		
	Finish		

Figure 3-7: Driver Installation



## **4 CONFIGURATION**

The USB-100BASE-T1 Converter is configured by using the Configurator window or using directly the system try icon.

After successful installation, you will see a new window with a drop-down menu containing a list of all Technica Engineering USB-100BASE-T1 devices connected to your PC.

🕽 USB to E	3R converter	?	×		
technica engineering					
LAN9500A	USB 2.0 to Ethernet 10/100 Ada	apter	<b>ں</b> ا		
	Master				
	Slave				

Figure 4-1: Windows Driver window (one device connected and detected)



Configuration Options:

- The "Master" button can be used to configure the BroadR-Reach port to work in Master mode.
- The "Slave" button can be used to configure the BroadR-Reach port to work in Slave mode.

When new devices are connected, they are detected automatically and appear on the drop-down list.

If you connect a new device and it doesn't appear automatically on the list, please press the " $\bigcirc$ " button.

The Master/Slave settings for each device are kept in memory, so that when you unplug and re-plug them, the latest setting will be used.

Note: In a BroadR-Reach Link one device must be set as Master, the other must be set as Slave.

On version 1.4 the user documentation is not directly linked to the "?" icon, so you will get the following information:



Figure 4-2: Prompt for Documentation



#### Please wait for version 1.5 coming soon!!

You can close the window by clicking on the "x", you can then find it again in the system tray:



Figure 4-3 Device Settings in Master / Slave

#### 4.1 NIC settings (information)

1) Network Interface Card (NIC) Set Up:

For the USB 100Base T1 device the NIC of the PC the default mode for the device speed on the USB-LAN side is "Auto Negotiation".

The 100BASE-T1 phy is always only set to 100 Mbps full duplex.

If desired, the user can follow these steps change USB-LAN NIC from auto negotiation to 100Mbps Full Duplex.

However, it must be noted, that these might have no influence at all in the functionality of the device.

- i. Go to Control Panel > Hardware and Sound > Device Manager
- ii. In the Device Manager Click on Network adapters > Right Click on LAN9500A USB 2.0 to Ethernet 10/100 Adapter > Properties



🛃 Device Manager	
File Action View Help	
🗢 🔿 🔟 🔟 🖬 💷 💺 🗙 🕥	
File       Action       View       Help            Batteries           Biometric devices           Biometric devices             Biuetooth           Bluetooth           Bluetooth             Bluetooth           Computer           Disk drives             Disk drives           Display adapters           Disk drives             Disk drives           Display adapters           Disk drives             Disk drives           Display adapters           Disk drives             Disk drives           Disk drives           Disk drives             Mice and other pointing devices           Metiot adapter	Update driver Disable device Uninstall device Scan for hardware changes Properties
Print queues	
Processors	
Security devices	
Smart card readers	
Software devices	
Sound, video and game controllers	
Storage controllers	
System devices	
Universal Serial Bus controllers	

Figure 4-4: Device Manager Properties



LAN9500A USB 2.0 to	Etherne	et 10/100	) Adapt	er #2 Propert	ies X
General Advanced	Driver	Details	Events	Power Mana	gement
The following propertie the property you want on the right.	to chan	vailable fo ge on the	r this net left, and	work adapter. I then select its	Click value
Property:			V	alue:	
Auto Mdix Energy Detect Powe Flow Control Network Address Priority & VLAN Selective Suspend I Selective Suspend I Speed & Duplex UOD D A List U VLAN ID Wake on magic pack Wake on pattern ma	dle Time ge Med ket tch	out		100 Mbps Full	Duplex
				ок	Cancel

Figure 4-5: 100Mbps Full Duplex Speed Selection

- iii. In Properties > Click on Advanced Tab > Select Speed & Duplex
- iv. In the Value drop down menu select 100 Mbps Full Duplex and Click OK





Figure 4-6: Apply Changes

v. Windows will send a prompt to restart the computer after this change. Click OK to restart the computer for the change to take place.



## **5 ADDITIONAL INFORMATION**

- The maximum cable length for BroadR-Reach segments is limited to 15 meters.
- The single unshielded twisted pair cable (UTP) must fulfill the IEEE 100BASE-T1 specifications



## 6 LIST OF FIGURES

Figure 1-1: USB-100BASE-T1 Converter	
Figure 2-1: Label of USB-100BASE-T1 Converter with pinning information	
Figure 3-1: Driver Installation Data Folder	7
Figure 3-2: Driver Installation Start Up screen	8
Figure 3-3: Driver Installation Terms and Conditions	9
Figure 3-4: Driver Installation	10
Figure 3-5: Driver Installation	11
Figure 3-6: Driver Installation	12
Figure 3-7: Driver Installation	13
Figure 4-1: Windows Driver window (one device connected and detected)	14
Figure 4-2: Prompt for Documentation	15
Figure 4-3 Device Settings in Master / Slave	16
Figure 4-4: Device Manager Properties	17
Figure 4-5: 100Mbps Full Duplex Speed Selection	18
Figure 4-6: Apply Changes	19



## 7 CHANGELOG

Version	Chapter	Description	Date
1.0	All	First release	
2.0	All	Second Release	25.09.2018
2.1.1	All	New Design and added Configuration for NIC	06.02.2019
2.1.2	All	Adaptions for new driver version 1.4, minor enhancements	21.02.2019
2.1.3	All	Bugfixes	25.03.2019



## 8 CONTACT

If you have any questions regarding this product, please feel free to contact us:

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General information: Info@technica-engineering.de

Most current user manuals and product information: <u>https://technica-engineering.de/</u>