technica engineering

100BASE-T1 MEDIA CONVERTER NXP

USER MANUAL

March 2020

Manual-Version: 2.4

Hardware-Version: 1.5

CONTENT

1 GENERAL INFORMATION

1.1 Functionality and Features of the 100BASE-T1 MediaConverter_NXP

Figure 1-1: 100BASE-T1 MediaConverter_NXP

The **Technica Engineering 100BASE-T1 MediaConverter_NXP** transmits data frames directly from the physical layer BroadR-Reach (100BASE-T1) to Fast Ethernet (100BASE-TX) with constant delay time of 2.0µs.

Features:

- 1 port BroadR-Reach (100BASE-T1) Ethernet with NXP TJA1100 Transceiver
- 1 port Fast Ethernet (100BASE-TX)
- Automotive Tyco MQS Connector for 100BASE-T1 and power supply
- Robust steel case
- DIP Switches for easy configuration

General Information:

Power requirement:	8 to 16 Volt DC (nominal 12 Volt DC)
Power consumption:	2 Watt
Size:	92 x 63 x 30 mm
Weight:	0,2 kg
International Protection:	IP 2 0
Operating temperature:	-40° to +80 °Celsius

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

https://technica-engineering.de/produkt/100base-t1-mediaconverter_nxp/

1.2 Warranty and Safety Information

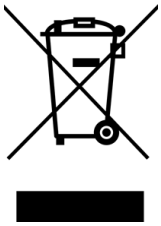
Before operating the device, read this manual thoroughly and retain it for your reference.
The latest documentation for the 100BASE-T1 MediaConverter_NXP can be downloaded here:
https://technica-engineering.de/produkt/100base-t1-mediaconverter_nxp/

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.

This device is designed for engineering purpose only.
Special care has to be taken for operation.
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.

Caution: The device can get hot.
Do not cover the device due to fire danger.
Do not place the device near to highly flammable materials due to fire danger.



If you wish to discard a 100BASE-T1 MediaConverter from Technica Engineering GmbH, please contact your dealer or supplier for further information.
This symbol is only valid in the European Union. If you wish to discard this product, please contact your local authorities or dealer and ask for the correct method of disposal. Technica Engineering GmbH is registered as manufacturer of the brand "Technica Engineering" and the device type "Small devices of Information- and Telecommunications- technology for exclusive use in non-private Households". WEEE reg. No. DE 20776859

1.3 Declaration of conformity

EG-Konformitätserklärung

gemäß der EG-Richtlinie 2004/108/EG (elektromagnetische Verträglichkeit) vom 15. Dezember 2004

Hiermit erklären wir, dass das nachstehend bezeichnete Gerät in seiner Konzeption und Bauart sowie in der von uns in Verkehr gebrachten Ausführung den grundlegenden Sicherheits- und Gesundheitsanforderungen der EG-Richtlinie 2004/108/EG entspricht. Bei einer mit uns nicht abgestimmten Änderung des Gerätes verliert diese Erklärung ihre Gültigkeit.

Hersteller: Technica Engineering
Leopoldstr. 236
80807 München

Bevollmächtigter: Joseba Rodriguez

Beschreibung des Gerätes:
100BASE-T1 MediaConverter_NXP

Datum der Erklärung: 04.08.2017

Name des Unterzeichners: Joseba Rodriguez

Unterschrift: .....

Figure 1-2: Declaration of conformity

1.4 Scope of Delivery

The delivery includes:

- 1x 100BASE-T1 MediaConverter NXP
- 1x 1m Ethernet Cable
- 1x Black MQS Connector
- 1x 1m 100BASE-T1 Cabling
- MQS Crimps

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 100BASE-T1 MediaConverter_NXP.

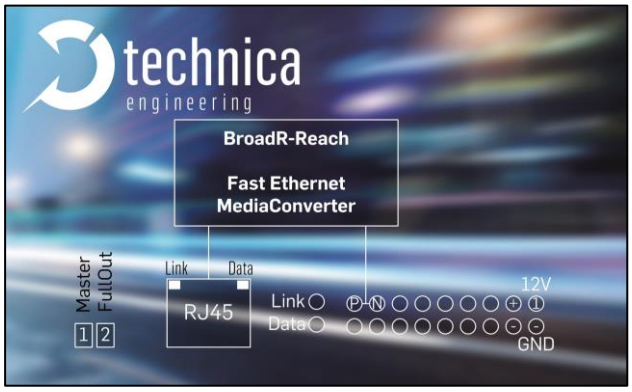


Figure 2-1: Label of 100BASE-T1 MediaConverter_NXP

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 power supply for the device is supplied by pin 1 (12 Volt) and pin 10 (Ground)

Warning: If you apply a voltage higher than 18 volts, the device will be damaged!

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

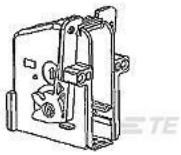
Name	Picture	Part Number
Tyco, MQS Abdeckkappe 2x9 Pol, black Alternative		1-967416-1 1-1355350-1
Tyco, MQS Buchsengehäuse 2x9 Pol Alternative		965778-1 962108-2
Tyco crimp contact		928999-1

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	Pin	Function
1	Battery +12 Volt Input	**10**	Power Ground
2	reserved	**11**	reserved
3	n.c.	**12**	n.c.
4	n.c.	**13**	n.c.
5	n.c.	**14**	n.c.
6	n.c.	**15**	n.c.
7	n.c.	**16**	n.c.
8	100BASE-T1 port, negative	**17**	n.c.
9	100BASE-T1 port, positive	**18**	n.c.

Table 2—2: Pinning of black MQS connector

2.1.2 RJ45 Ethernet connectors

There is one RJ45 Standard Ethernet connector for Fast Ethernet (100BASE-TX).

2.2 Other Interfaces

2.2.1 DIP switches

The 100BASE-T1 MediaConverter_NXP has two DIP switches for configuration (see CHAPTER 3).

2.2.2 Status LEDs

The 100BASE-T1 MediaConverter_NXP has two status LEDs at the frontside of the case for the 100BASE-T1 Port.

Upper LED:
Green Color. It is lit when there is a linkup on the 100BASE-T1 port.

Lower LED:
Yellow Color. It is toggling in alternation with the green LED when there is communication.

Note: There is a bug in the used BroadR-Reach PHY. When the 100BASE-T1 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 connect the 100BASE-T1 lines correctly.

3 CONFIGURATION OF THE DEVICE

The 100BASE-T1 MediaConverter is configured by two **DIP switches** on the front of the device.

DIP-Switch	Status	Description
1	ON (up) OFF (down)	100BASE-T1 Port is set to Master 100BASE-T1 Port is set to Slave
2	ON (up) OFF (down)	100BASE-T1 Port is set to FullOut 100BASE-T1 Port is set to HalfOut

Table 3—1: Configuration of DIP-Switches

Note: In a 100BASE-T1 Link one device has to be set as Master, the other has to be set as Slave.

Note: The 100BASE-T1 MediaConverter_NXP should always be set to FullOut. HalfOut was a former configuration for EMC optimization but it will cause an instable link.

4 STANDARD USE CASE

Here you can see a standard use case of the 100BASE-T1 MediaConverter_BCM:

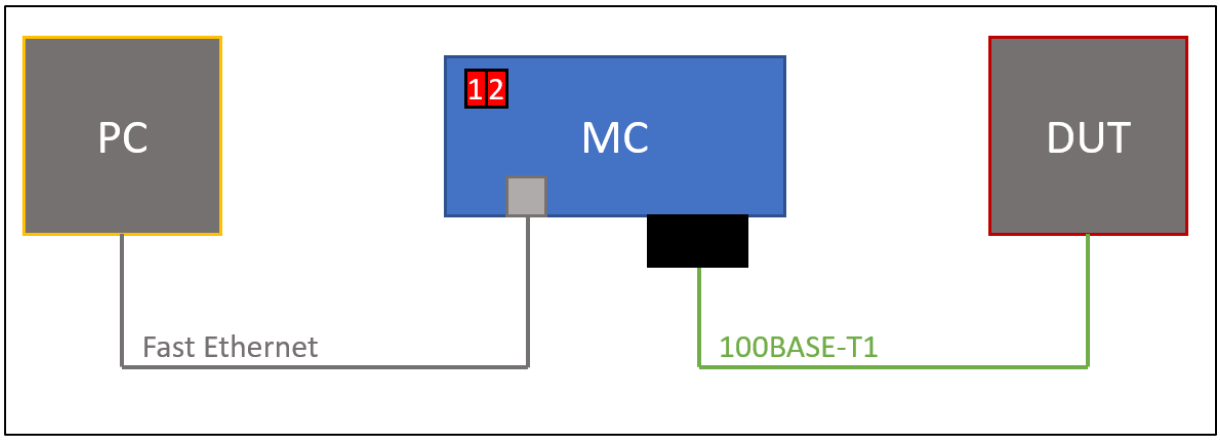


Figure 4-1: Example for use case

MC: **M**edia**C**onverter
DUT: **D**evice **u**nder **T**est.

DIP-Switch 2 should be always ON, DIP-Switch 1 is dependent of the DUT. If DUT is Master, MC must be configured as Slave (DIP-switch 1: OFF) and vice versa.

5 100BASE-T1 FILTER

The following 100BASE-T1 filter is used in the 100BASE-T1 MediaConverter_NXP Hardware version 1.0 and following

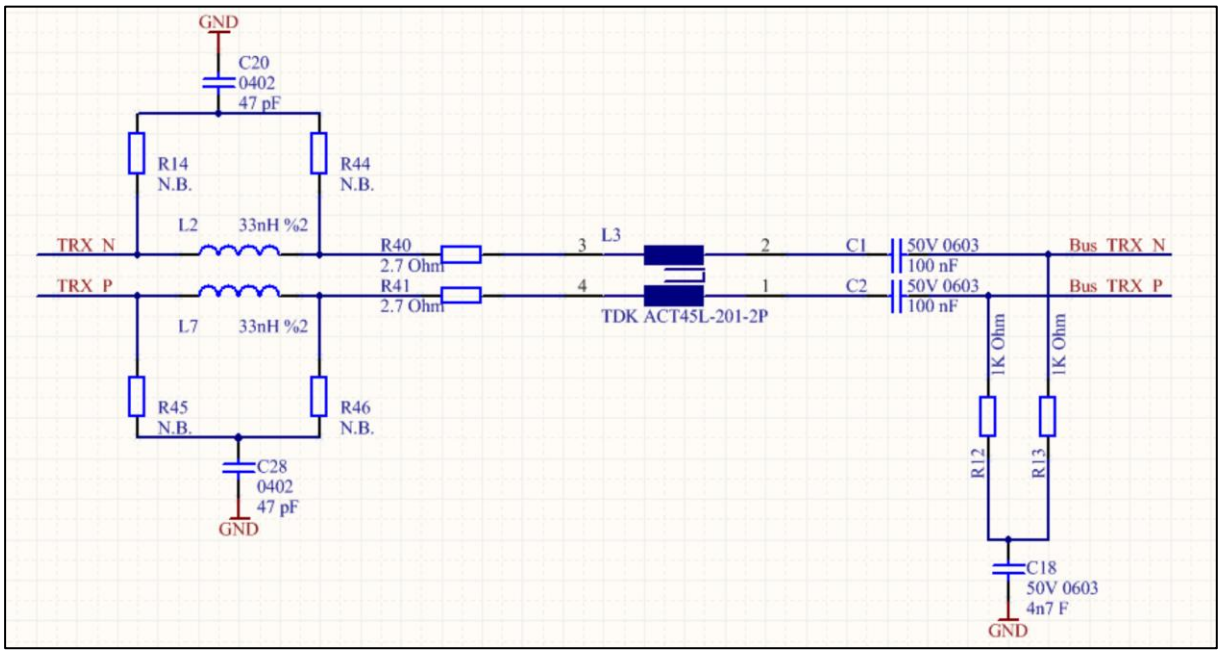


Figure 5-1: 100BASE-T1 filter for HW v1.0 and following

6 ADDITIONAL INFORMATION

- The 100BASE-T1 MediaConverter_NXP is optimized for automotive use. The maximum cable length for 100BASE-T1 segments is limited to 15 meters
- The difference between the 100BASE-T1 MediaConverter_BCM and 100BASE-T1 MediaConverter_NXP is the used transceiver for the 100BASE-T1 PHY. In the beginning of development there were problems with the interoperability of different PHY manufacturers. Now the interoperability is given, and the functionality is independent from the PHY manufacturer.

7 LIST OF FIGURES

8 CHANGELOG

Version	Chapter	Description	Date
1.0	All	First release	
2.0	All	Rework of design and update of all information	21.09.2018
2.1	All	Design and rework of content	25.02.2019
2.2	1.4, 4	Chapters added	08.05.2019
2.3	1.2	Extension of warranty and safety	23.03.2020
2.3	All	Optical adaption	23.03.2020
2.4	All	Small spelling corrections	May 2020

9 CONTACT

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

Technica Engineering GmbH
Leopoldstr. 236
80807 München
Germany

Technical support:
support@technica-engineering.de

General information:
Info@technica-engineering.de

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