

# 100BASE-T1 MEDIACONVERTER NXP

## USER MANUAL

May 2019

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## 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 2.0 $\mu$ s.

#### 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:

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|                           |                                      |
|---------------------------|--------------------------------------|
| 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                 |

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## 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/](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/](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.

## 1.3 Declaration of conformity

|   |  |
|---|--|
| <b><u>EG-Konformitätserklärung</u></b>  |  |
| <b>gemäß der EG-Richtlinie 2004/108/EG (elektromagnetische Verträglichkeit)<br/>vom 15. Dezember 2004</b>   |  |
| <p>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.</p> |  |
| <b>Hersteller:</b>  | Technica Engineering<br>Leopoldstr. 236<br>80807 München                                     |
| <b>Bevollmächtigter:</b>  | Joseba Rodriguez   |
| <b>Beschreibung des Gerätes:</b>  | 100BASE-T1 MediaConverter_NXP  |
| <b>Datum der Erklärung:</b>   | 04.08.2017   |
| <b>Name des Unterzeichners:</b>   | Joseba Rodriguez   |
| <b>Unterschrift:</b>  | <br>..... |

Figure 1-2: Declaration of conformity

## 1.4 Scope of Delivery

The delivery includes:

- 1x 100BASE-T1 MediaConverter NXP
- 1x 1m Ethernet Cable
- 1 x Cableset (incl. connectors, crimps, cables and banana plugs)

## 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.

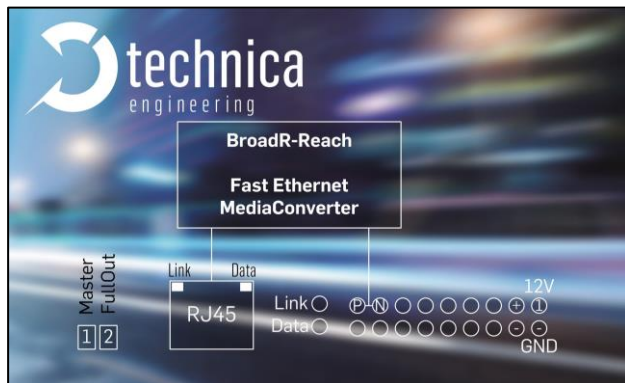


Figure 2-1: Label of 100BASE-T1 MediaConverter\_NXP

#### 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 Volt, 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<br>1-1355350-1 |
| Tyco, MQS Buchsengehäuse 2x9 Pol Alternative     |  | 965778-1<br>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 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 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)    | 100BASE-T1 Port is set to Master  |
|            | OFF (down) | 100BASE-T1 Port is set to Slave   |
| 2          | ON (up)    | 100BASE-T1 Port is set to FullOut |
|            | OFF (down) | 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:

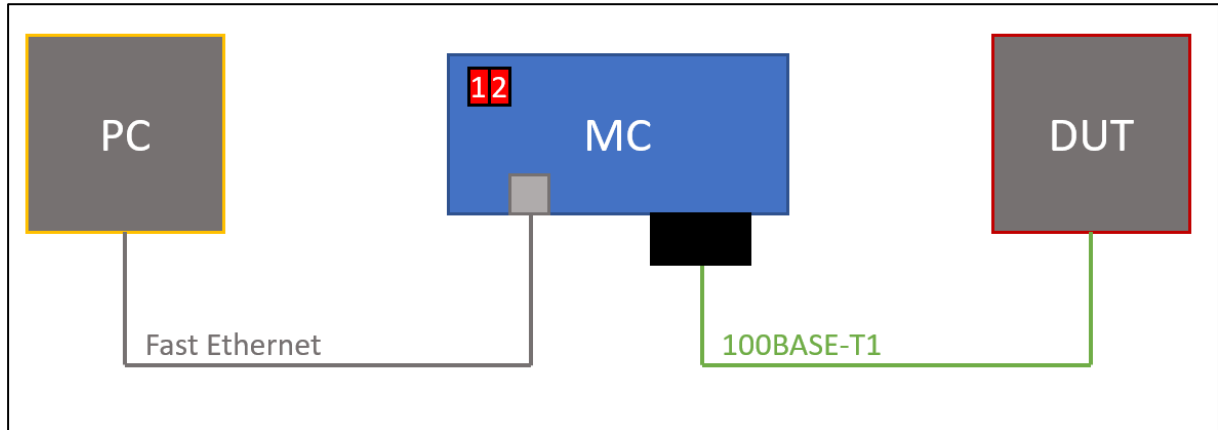


Figure 4-1: Example for use case

MC: **MediaConverter**  
DUT: **Device under Test**.

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)

## 5 100BASE-T1 FILTER

The following BR-Filter is used in the 100BASE-T1 MediaConverter\_NXP Hardware version 1.0:

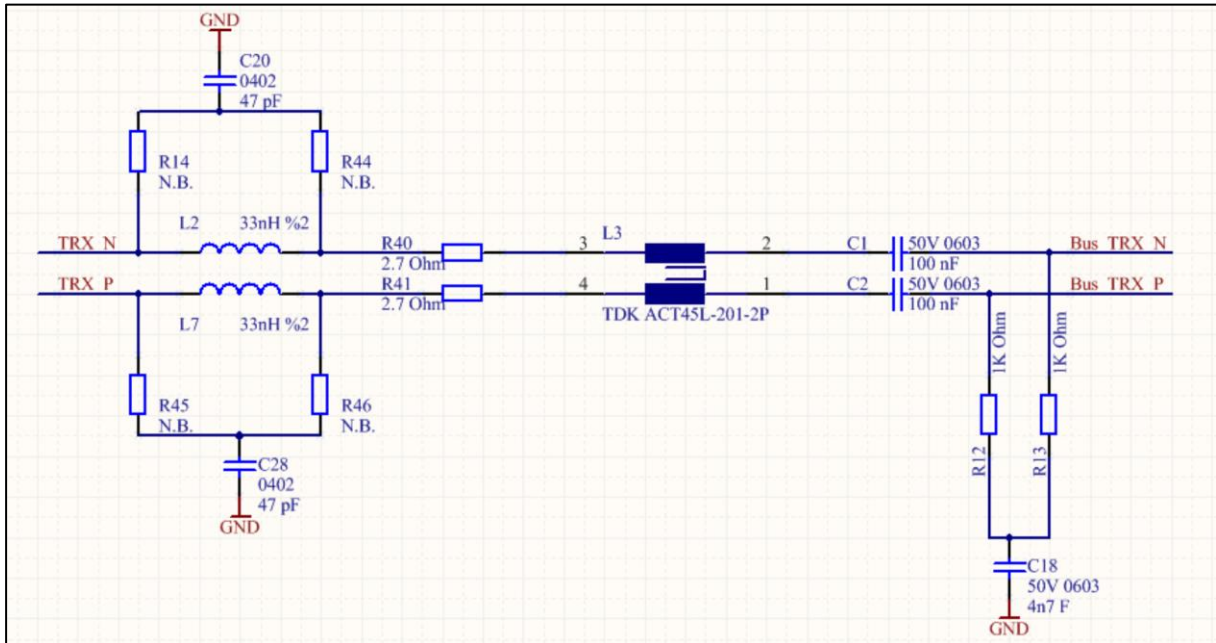


Figure 5-1: BR-Filter for HW v1.0

## 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

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## 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 |

## 9 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](mailto:Info@technica-engineering.de)

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