

100BASE-T1 MEDIA CONVERTER BCM

USER MANUAL

May 2020

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1 GENERAL INFORMATION

1.1 Functionality and Features of the 100BASE-T1 MediaConverter_BCM



Figure 1-1: 100BASE-T1 MediaConverter_BCM

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

Features:

- 1 port BroadR-Reach (100BASE-T1) Ethernet with Broadcom BCM89810 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_BCM here:

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

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_BCM can be downloaded here:

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



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

<u>EG-Konformitätserklärung</u>	
gemäß der EG-Richtlinie 2004/108/EG (elektromagnetische Verträglichkeit) vom 15. Dezember 2004	
<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>	
Hersteller:	Technica Engineering Leopoldstr. 236 80807 München
Bevollmächtigter:	Joseba Rodriguez
Beschreibung des Gerätes:	100BASE-T1 MediaConverter_BCM
Datum der Erklärung:	01.08.2016
Name des Unterzeichners:	Joseba Rodriguez
Unterschrift:	

Figure 1-2: Declaration of conformity

1.4 Scope of Delivery

The delivery includes:

- 1x 100BASE-T1 MediaConverter BCM
- 1x 1m Ethernet Cable
- 1x Black MQS Connector
- 1x 1m 100BASE-T1 Cable
- MQS crimp contacts

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_BCM.

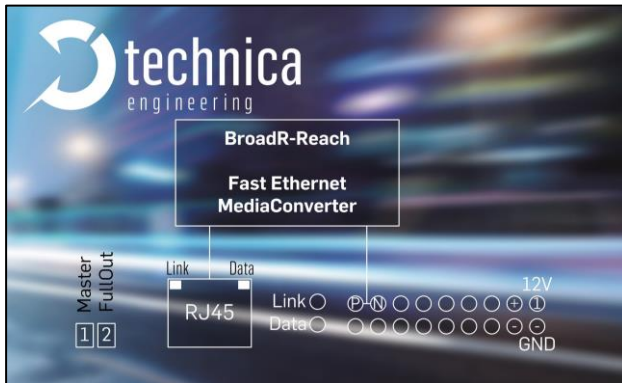


Figure 2-1: Label of 100BASE-T1 MediaConverter_BCM

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 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_BCM has two DIP switches for configuration (see [CHAPTER 3](#)).

2.2.2 Status LEDs

The 100BASE-T1MediaConverter_BCM 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)	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 must be set as Master, the other must be set as Slave.

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

4 STANDARD USE CASE

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

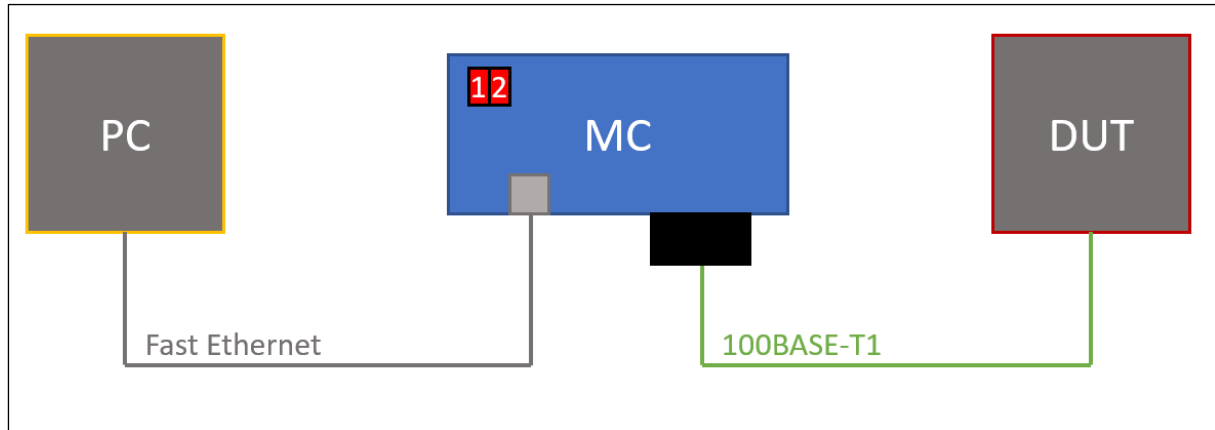


Figure 4-1: Example for use case

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) and vice versa.

5 100BASE-T1 FILTER

There are different BroadR-Reach filters in different hardware versions of the 100BASE-T1 MediaConverter_BCM:

The following 100BASE-T1 filter is used in the hardware version 3.0:

In Version 3.0 the Würth CMC 510010003 is used for L32.

In Version 3.0a the TDK CMC ACT45L - 2 01 - 2P is used for L32.

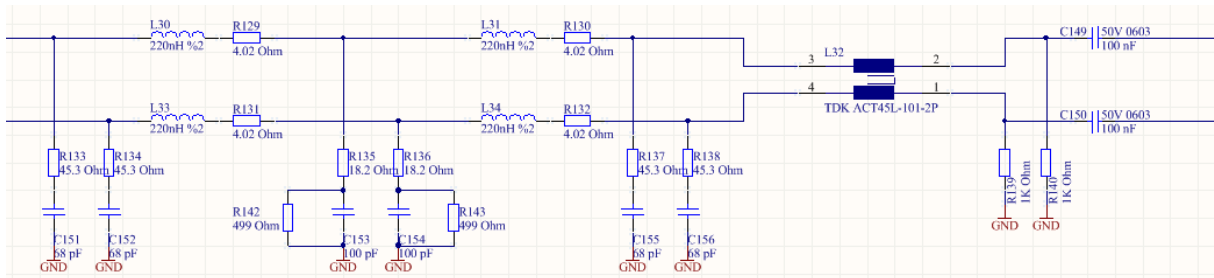


Figure 5-1: 100BASE-T1 filter for HW v3.0 and v3.0a

The following 100BASE-T1 filter is used in the hardware version 2.0:

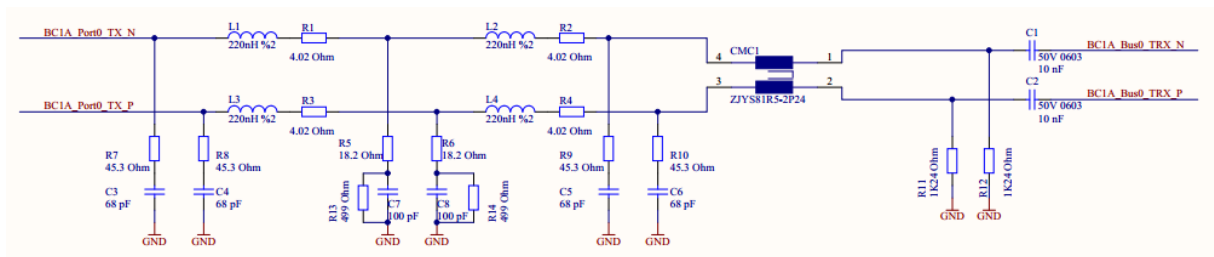


Figure 5-2: 100BASE-T1 filter for HW v2.0

All filter versions are compatible to each other and it is possible to set up a stable link. It is recommended to use the latest filter version.

6 ADDITIONAL INFORMATION

- The delay time is constant 2.0 μ s. The delay is independent from the ethernet packet frame size.
- The 100BASE-T1 MediaConverter_BCM is optimized for automotive use. The maximum cable length for 100BASE-T1 segments is limited to 15 meters
- The 100BASE-T1 MediaConverter is a physical layer changer. It is independent from transmitted protocol sent on the 100BASE-T1.

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8 CHANGELOG

Version	Chapter	Description	Date
1.0	All	First release	
2.0	All	Second release	21.09.2018
2.1	All	Design and rework of content	25.02.2019
2.2	4	Chapter added	29.04.2019
2.3	1.4	Correction of PHY name	23.03.2020
2.3	1.2	Extension of warranty and safety	23.03.2020
2.3	All	Optical adaption	23.03.2020
2.4	All	Small corrections in spelling	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/>