



# 1000BASE-T1 MEDIACONVERTER \_EMC

## USER MANUAL

September 2018

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Hardware-Version: 1.4

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## 1 GENERAL INFORMATION

### 1.1 Functionality and Features of the 1000BASE-T1 MediaConverter\_EMC



Figure 1–1: 1000BASE-T1 MediaConverter\_EMC

The **Technica Engineering 1000BASE-T1 MediaConverter\_EMC** transmits data frames directly from the physical layer 1000BASE-T1 to a chosen physical layer of the used SFP module. This SFP modules can be standard Ethernet RJ45 modules or optical Gbit Ethernet SFP modules with constant delay.

#### Features:

- 1 Port 1000Base-T1 Ethernet with Marvell 88Q2112 Transceiver, 1000 MBit/s Full duplex on a single unshielded twisted pair
- 1 SFP Port Gigabit Ethernet
- MATenet Connector
- 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:	95 x 100 x 27 mm
Weight:	0,3 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 1000BASE-T1 MediaConverter\_EMC here:

<https://technica-engineering.de/produkt/1000base-t1-emc-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 1000BASE-T1 MediaConverter\_EMC can be downloaded here:

<https://technica-engineering.de/produkt/1000base-t1-emc-converter/>



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) 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 Leopoldstr. 236 80807 München
<b>Bevollmächtigter:</b>	Joseba Rodriguez
<b>Beschreibung des Gerätes:</b>	1000BASE-T1 MediaConverter_EMC
<b>Datum der Erklärung:</b>	21.06.2017
<b>Name des Unterzeichners:</b>	Joseba Rodriguez
<b>Unterschrift:</b>	 .....

Figure 1–2: Declaration of conformity

## 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 1000BASE-T1 MediaConverter\_EMC.

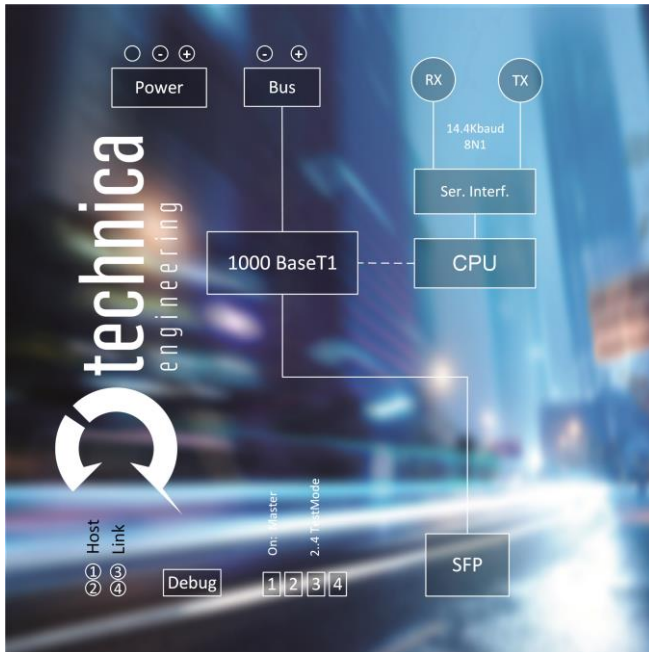


Figure 2–1: Label of 1000BASE-T1 MediaConverter\_EMC with pinning information

#### 2.1.1 MATenet Connectors

The pinning of the ECU connector is shown on the label on top of the device as well. (See **Fehler! Verweisquelle konnte nicht gefunden werden.**).

The left MATenet connector is for power supply.

The right MATenet connector is for BUS connection to the device under test (DUT).

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

## Pinning:

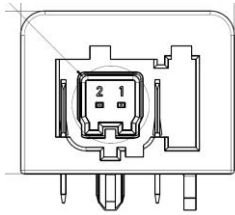


Figure 2–2: MATEnet Connector

Pin	Function
1	Minus
2	Plus

Table 2–1: Pinning MATEnet Connector

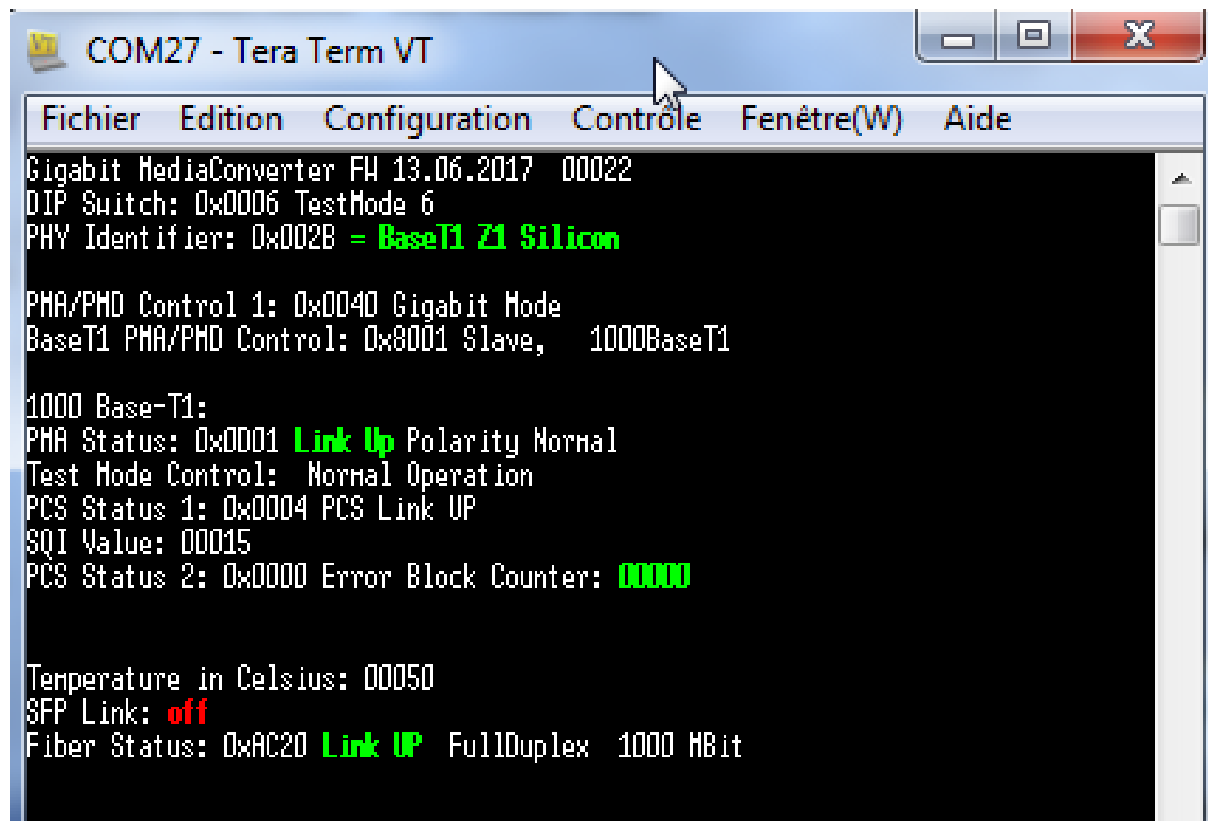
## 2.1.2 Optical Interface on the backside

The optical interface is a serial terminal connection. For using this a special USB Adapter is required (Please ask for this adapter).

- Plug in the optical cable on both sides crossover. RX – TX
- Open a Terminal program (e.g. TeraTerm) at your PC and open the USB Device as serial connection.
- Speed settings: 14.400 kbit/s and 8N1.
- Status information is displayed. The error counter can be reset by pressing “Space” key

## Shown Information:

Mainly there are SQI and Block Error Counter displayed. Here is an example:



```
COM27 - Tera Term VT
Fichier  Edition  Configuration  Contrôle  Fenêtre(W)  Aide
Gigabit MediaConverter FW 13.06.2017 00022
DIP Switch: 0x0006 TestMode 6
PHY Identifier: 0x002B = BaseT1 Z1 Silicon

PMA/PHD Control 1: 0x0040 Gigabit Mode
BaseT1 PMA/PHD Control: 0x8001 Slave, 1000BaseT1

1000 Base-T1:
PMA Status: 0x0001 Link Up Polarity Normal
Test Mode Control: Normal Operation
PCS Status 1: 0x0004 PCS Link UP
SQI Value: 00015
PCS Status 2: 0x0000 Error Block Counter: 00000

Temperature in Celsius: 00050
SFP Link: off
Fiber Status: 0xAC20 Link UP FullDuplex 1000 MBit
```

Figure 2–3: Example for shown values in Tera Term

### 2.1.3 SFP-Interface

There is one SFP cage for a MiniGBIC module.

Following SFP-modules are tested and recommended:

Copper SFP-module:

BEL SFP-1GBT-05, 10/100/1000BASE-T SFP

Optical SFP-module:

Delock 86186

### 2.1.4 USB mini connector

This is an interface for programming and debugging (for development.)



## 2.2 Other interfaces

### 2.2.1 DIP-Switches

The 1000BASE-T1 MediaConverter\_EMC has four DIP-Switches for configuration (see Chapter 3).

### 2.2.2 Status LEDs

The 1000BASE-T1 MediaConverter\_EMC has four LEDs at the frontside of the case.

**Upper left LED (No. 1):**

Green Color. It is lit when there is a linkup on the SFP-Port

**Lower left LED (No. 2):**

Yellow Color. It is toggling (approx. 0,5 sec) when the processor is working fine.

**Upper right LED (No. 3):**

Green Color. It is lit when there is a linkup on the 1000BASE-T1 port.

**Lower right LED (No. 4):**

Yellow Color. It is lit, if power on. And it is toggling during communication on the 1000BASE-T1 port.

### 3 CONFIGURATION OF THE DEVICE

The 1000BASE-T1 MediaConverter\_EMC is configured by two **DIP-Switches** on the front of the device.

DIP-Switch	Status	Description
1	ON (up)	1000BASE-T1 Port is set to Master
	OFF (down)	1000BASE-T1 Port is set to Slave
2-4	ON (up)	2 OR 3 OR 4: Test Modes for PHYs
	OFF (down)	All OFF: Normal Operation Mode

Table 3–1: Configuration of DIP-Switches

**Note:** In a 1000BASE-T1 Link one device must be set as Master, the other has to be set as Slave.

## 4 1000BASE-T1 Filter

The following 1000BASE-T1 Filter is used in the 1000BASE-T1 MediaConverter\_EMC:  
The Pulse AE5002 is used.

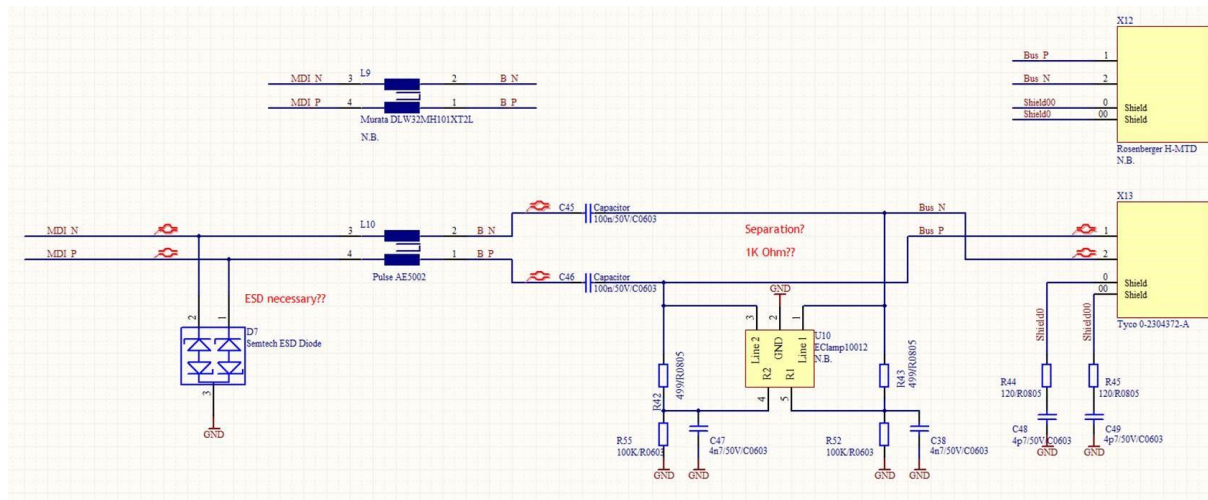


Figure 4–1: Used Filter in 1000BASE-T1 MediaConverter\_EMC

## 5 GENERAL EMC TEST INFORMATION

### Testcases:

We test our EMC products with 350 V/m in a Stripline setup from 1 MHz to 1 GHz. The devices are not damaged in this setup.

There will be no Link Drop on 100BASE-T1 or 1000BaseT1.

**Warning:** At frequencies below 1 MHz immunity must be tested at a maximum of 100V/m. Otherwise the devices will be permanently damaged!

We test our EMC products with 200 mA in a BCI substitution setup from 1 MHz to 1 GHz. The devices are not damaged in this setup.

There will be no Link Drop on 100BASE-T1 or 1000BaseT1.

**Warning:** BCI closed loop method is not allowed for 100BASE-T1 or 1000BaseT1 products. This test would permanently damage any device (independent of the vendor of device) if your generator is strong enough.

**Warning:** At frequencies below 1 MHz the immunity must be tested at a maximum of 40 mA. Otherwise the devices will be permanently damaged!

### Emission:

We test our EMC devices according to automotive emission standards. Because standards and expectations vary, we grant a 4 week return period. You can test our device according to your needs in your chamber. If you are not satisfied with the result you can return the devices and get refunded.

## 6 ADDITIONAL INFORMATION

- The 1000BASE-T1 MediaConverter\_EMC is optimized for automotive use. The maximum cable length for 1000BASE-T1 segments is limited to 15 meters.
- HW-version until v1.3 was delivered with nano-MQS connector instead of MATenet connectors. If you need information about the pinning for the old version, please ask for that [support@technica-engineering.de](mailto:support@technica-engineering.de).

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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	19.11.2018

Table 8–1: Changelog

## 9 CONTACT

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

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