



The Synchronization Experts.



## TECHNICAL REFERENCE

### FO/FOS CONVERTER

Signal Distribution over long Distances

May 2, 2023

Meinberg Funkuhren GmbH & Co. KG



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# 1 Imprint

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## 3 Presentation Conventions in this Manual

### 3.1 Conventions for the Presentation of Critical Safety Warnings

Warnings are indicated with the following warning boxes, using the following signal words, colors, and symbols:



#### Caution!

This signal word indicates a hazard with a **low risk level**. Such a notice refers to a procedure or other action that may result in **minor injury** if not observed or if improperly performed.



#### Warning!

This signal indicates a hazard with a **medium risk level**. Such a notice refers to a procedure or other action that may result in **serious injury** or even **death** if not observed or if improperly performed.



#### Danger!

This signal word indicates a hazard with a **high risk level**. Such a notice refers to a procedure or other action that will very likely result in **serious injury** or even **death** if not observed or if improperly performed.

### 3.2 Secondary Symbols Used in Safety Warnings

Some warning boxes may feature a secondary symbol that emphasizes the defining nature of a hazard or risk.



The presence of an "electrical hazard" symbol is indicative of a risk of electric shock or lightning strike.



The presence of a "fall hazard" symbol is indicative of a risk of falling when performing work at height.



Das Symbol "laser hazard" symbol is indicative of a risk relating to laser radiation.

### 3.3 Conventions for the Presentation of Other Important Information

Beyond the above safety-related warning boxes, the following warning and information boxes are also used to indicate risks of product damage, data loss, and information security breaches, and also to provide general information for the sake of clarity, convenience, and optimum operation:



#### Important!

Warnings of risks of product damage, data loss, and also information security risks are indicated with this type of warning box.



#### Information:

Additional information that may be relevant for improving efficiency or avoiding confusion or misunderstandings is provided in this form.

### 3.4 Generally Applicable Symbols

The following symbols and pictograms are also used in a broader context in this manual and on the product.



The presence of the "ESD" symbol is indicative of a risk of product damage caused by electrostatic discharge.



Direct current (DC) (*symbol definition IEC 60417-5031*)



Alternating current (AC) (*symbol definition IEC 60417-5032*)



Ground connection (*symbol definition IEC 60417-5017*)



Protective earth connection (*symbol definition IEC 60417-5019*)

## 4 Important Safety Information



The safety information provided in this chapter as well as specific safety warnings provided at relevant points in this manual must be observed during every installation, set-up, and operation procedure of the device, as well as its removal from service.

Any safety warnings affixed to the device itself must also be observed.

Any failure to observe this safety information, these safety warnings, and other safety-critical operating instructions in the product documentation, or any other improper usage of the device may result in unpredictable behavior from the product, and may result in injury or death.

Depending on your specific device configuration and installed options, some safety information may not be applicable to your device.

Meinberg accepts no responsibility for injury or death arising from a failure to observe the safety information, warnings, and safety-critical instructions provided in the product documentation.

It is the responsibility of the operator to ensure that the product is safely and properly used.

Should you require additional assistance or advice on safety-related matters for your product, Meinberg's Technical Support team will be happy to assist you at any time. Simply send a mail to [techsupport@meinberg.de](mailto:techsupport@meinberg.de).

### 4.1 Appropriate Usage



**The device must only be used appropriately in accordance with the specifications of the product documentation!** Appropriate usage is defined exclusively by this manual as well as any other relevant documentation provided directly by Meinberg.

**Appropriate usage includes in particular compliance with specified limits!** The device's operating parameters must never exceed or fall below these limits!



## 4.2 Product Documentation

The information in this manual is intended for readers with an appropriate degree of safety awareness. The following are deemed to possess such an appropriate degree of safety awareness:

- skilled persons with a familiarity with relevant national safety standards and regulations,
- instructed persons having received suitable instruction from a skilled person on relevant national safety standards and regulations



If there is any safety information in the product documentation that you do not understand, **do not** continue with the set-up or operation of the device!

Read the product manual carefully and completely before you set the product up for use.

Safety standards and regulations change on a regular basis and Meinberg updates the corresponding safety information and warnings to reflect these changes. It is therefore recommended to visit the Meinberg website at <https://www.meinbergglobal.com> regularly to download up-to-date manuals.

Please keep all product documentation, including this manual, in a safe place in digital or printed format to ensure that it is always easily accessible.

Meinberg's Technical Support team is also always available at [techsupport@meinberg.de](mailto:techsupport@meinberg.de) if you require additional assistance or advice on safety aspects of your system.

## 4.3 Safety when Installing the Device

This rack-mounted device has been designed and tested in accordance with the requirements of the standard IEC 62368-1 (*Audio/Video, Information and Communication Technology Equipment—Part 1: Safety Requirements*). Where the rack-mounted device is to be installed in a larger unit (such as an electrical enclosure), additional requirements in the IEC 62368-1 standard may apply that must be observed and complied with. General requirements regarding the safety of electrical equipment (such as IEC, VDE, DIN, ANSI) and applicable national standards must be observed in particular.

The device has been developed for use in industrial or home environments and may only be used in such environments. In environments at risk of high environmental conductivity ("high pollution degree" according to IEC 60664-1), additional measures such as installation of the device in an air-conditioned electrical cabinet may be necessary.



If the unit has been brought into the usage area from a cold environment, condensation may develop; in this case, wait until the unit has adjusted to the temperature and is completely dry before setting it up.

When unpacking & setting up the equipment, and before operating it, be sure to read the information on installing the hardware and the specifications of the device. These include in particular dimensions, electrical characteristics, and necessary environmental conditions.

Fire safety standards must be upheld with the device in its installed state.

The device with the highest mass should be installed at the lowest position in the rack in order to position the center of gravity of the rack as a whole as low as possible and minimize the risk of the rack tipping over. Further devices should be installed from the bottom, working your way up.

The device must be protected against mechanical & physical stresses such as vibration or shock.

**Never** drill holes into the device to mount it! If you are experiencing difficulties with rack installation, contact Meinberg's Technical Support team for assistance!

Inspect the device housing before installation. The device housing must be free of any damage when it is installed.

## 4.4 Connection of Protective Earth Conductor/Grounding

In order to ensure that the device can be operated safely and to meet the requirements of IEC 62368-1, the device must be correctly connected to the protective earth conductor via the protective earth connection terminal.



If an external ground connection is provided on the housing, it must be connected to the grounding busbar (earthing busbar) for safety reasons before connecting the power supply. Like this, any possible leakage current on the housing is safely discharged to earth.



The screw, washer and toothed lock washer necessary for mounting the grounding cable are located at the grounding point of the housing. A grounding cable is not included in the contents of delivery.



**Note:** Please use a grounding cable with cross-section  $\geq 1.5 \text{ mm}^2$ , as well as a suitable grounding clamp/lug. Always ensure that the connection is properly crimped!

## 4.5 Electrical Safety

**This Meinberg product is operated at a hazardous voltage.**

This system may only be set up and connected by a skilled person, or by an instructed person who has received appropriate technical & safety training from a skilled person.

Custom cables may only be assembled by a qualified electrician.

**Never** work on cables carrying a live current!

**Never** use cables or connectors that are visibly damaged or known to be defective! Faulty, defective, or improperly connected shielding, connectors, or cables present a risk of injury or death due to electric shock and may also constitute a fire hazard!

Before operating the device, check that all cables are in good order. Ensure in particular that the cables are undamaged (for example, kinks), that they are not wound too tightly around corners, and that no objects are placed on the cables.

Cables must be laid in such a way that they do not present a tripping hazard.

The power supply should be connected using a short, low-inductance cable. Avoid the use of power strips or extension cables if possible. If the use of such a device is unavoidable, ensure that it is expressly rated for the rated currents of all connected devices.

**Never** connect or disconnect power, data, or signal cables during a thunderstorm! Doing so presents a risk of injury or death, as cables and connectors may conduct very high voltages in the event of a lightning strike!

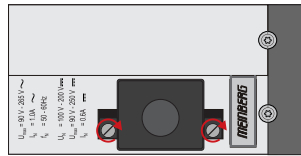
The device cables must be connected or disconnected in the order specified in the user documentation for the device. Connect all cables only while the device is de-energized before you connect the power supply.

**Always** pull cable connectors out at both ends before performing work on connectors! Improperly connecting or disconnecting this Meinberg system may result in electric shock, possibly resulting in injury or death!

When pulling out a connector, **never** pull on the cable itself! Pulling on the cable may cause the plug to become detached from the connector or cause damage to the connector itself. This presents a risk of direct contact with live components.



5-Pin MSTB Connector



3-Pin MSTB Connector

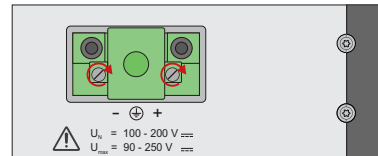


Fig.: Lock screws on an MSTB plug connector; in this case on a LANTIME M320

Ensure that all plug connections are secure. In particular, when using plug connectors with lock screws, ensure that the lock screws are securely tightened. This is especially important for power supply connectors where 3-pin or 5-pin MSTB connectors with lock screws are used (see illustration).

Before the device is connected to the power supply, the device housing must be grounded by connecting a grounding conductor to the grounding terminal of the device.

When installing the device in an electrical enclosure, it must be ensured that adequate clearance is provided, minimum creepage distances to adjacent conductors are maintained, and that there is no risk of short circuits.



Protect the device from the ingress of objects or liquids!



If the device malfunctions or requires servicing (for example, due to damage to the housing, power supply cable, or the ingress of liquids or objects), the power supply may be cut off. In this case, the device must be isolated immediately and physically from all power supplies! Electrical isolation must be performed and confirmed in accordance with the following procedure:

- Pull the power supply plug from the power supply.
- Loosen the locking screws of the MSTB power supply plug on the device and pull it out of the device.
- Contact the person responsible for your electrical infrastructure.
- If your device is connected to one or more uninterruptible power supplies (UPS), the direct power supply connection between the device and the UPS solution must be first be disconnected.

### 4.5.1 Special Information for Devices with DC Power Supply



In accordance with IEC 62368-1, it must be possible to disconnect the appliance from the supply voltage from a point other than the appliance itself (e.g., from the primary circuit breaker).

The power supply plug may only be fitted or dismantled while the appliance is isolated from the power supply (e.g., disconnected via the primary circuit breaker).

Power supply cables must have adequate fuse protection and have an adequate wire gauge size (1 mm<sup>2</sup> — 2.5 mm<sup>2</sup> / 17 AWG — 13 AWG)

The power supply of the device must have a suitable on-demand disconnection mechanism (i.e., a switch). This disconnection mechanism must be readily accessible in the vicinity of the appliance and marked accordingly as a cut-off mechanism for the appliance.

## 4.6 Safety when Maintaining and Cleaning the Device

Only use a soft, dry cloth to clean the device.

Never use liquids such as detergents or solvents to clean the device! The ingress of liquids into the device housing may cause short circuits in the electronic circuitry, which in turn can cause a fire or electric shock!



Neither the device nor its individual components may be opened. The device or its components may only be repaired by the manufacturer or by authorized personnel. Improperly performed repairs can put the user at significant risk!

In particular, **never** open a power supply unit or module, as hazardous voltages may be present within the power supply device even after it is isolated from the upstream voltage. If a power supply unit or module is no longer functional (for example due to a defect), it can be returned to Meinberg for repair.

Some components of the device may become very hot during operation. **Do not touch these surfaces!**

If maintenance work is to be performed on the device and the device housing is still hot, switch off the device beforehand and allow it to cool.

## 5 Important Product Information

### 5.1 CE Marking

This product bears the CE mark as is required to introduce the product into the EU Single Market.



The use of this mark is a declaration that the product is compliant with all requirements of the EU directives effective and applicable as at the time of manufacture of the product. These directives are listed in the EU Declaration of Conformity, appended to this manual as Chapter 8.

### 5.2 UKCA Marking

This product bears the British UKCA mark as is required to introduce the product into the United Kingdom (excluding Northern Ireland, where the CE marking remains valid).



The use of this mark is a declaration that the product is in conformity with all requirements of the UK statutory instruments applicable and effect as at the time of manufacture of the product. These statutory instruments are listed in the UK Declaration of Conformity, appended to this manual as Chapter 9.

### 5.3 Ensuring the Optimum Operation of Your Device

- Ensure that ventilation slots are not obscured or blocked by dust, otherwise heat may build up inside the device. While the system is designed to shut down automatically in the event of temperature limits being exceeded, the risk of malfunctions and product damage following overheating cannot be entirely eliminated.
- The device is only deemed to be appropriately used and EMC limits (electromagnetic compatibility) are only deemed to be complied with while the device housing is fully assembled in order to ensure that requirements pertaining to cooling, fire safety, electrical shielding and (electro)magnetic shielding are upheld.



## 5.4 Disposal

### Disposal of Packaging Materials



The packaging materials that we use are fully recyclable:

Material	Use for	Disposal
Polystyrene	Packaging frame/filling material (e.g., polystyrene peanuts)	Recycling Depot
PE-LD (Low-density polyethylene)	Accessories packaging, bubble wrap	Recycling Depot
Cardboard	Shipping packaging, accessories packaging	Paper Recycling

For information on the proper disposal of packaging materials in your specific country, please inquire with your local waste disposal company or authority.

### Disposal of the Device



This product falls under the labeling obligations of the Waste Electrical and Electronic Equipment Directive 2012/19/EU ("*WEEE Directive*") and thus bears this WEEE symbol. The presence of this symbol indicates that this electronic product may only be disposed of in accordance with the following provisions.



#### Important!

Do not dispose of the product or batteries via the household waste. Inquire with your local waste disposal company or authority on how to best dispose of the product or battery if necessary.

This product is considered to be a "B2B" product for the purposes of the WEEE Directive and is also classified as "IT and Telecommunications Equipment" in accordance with Annex I of the Directive.

It can be returned to Meinberg for disposal. In this case, the shipping costs are to be borne by the customer, while Meinberg will cover the costs for disposal. If you wish for Meinberg to handle disposal for you, please get in touch with us. Otherwise, please use the return and collection systems provided within your country to ensure that your device is disposed of in a compliant fashion to protect the environment and conserve valuable resources.

## 6 Fiber Optic Converter Overview

The following fiber optic converters have been designed for the distribution of electrical signals over optical fibers. The multi mode converters are linked via an optical GI50/125  $\mu\text{m}$  or GI62.5/125  $\mu\text{m}$  multimode fiber using a wave length of 850 nm. The single mode converters are linked via an optical E9/125  $\mu\text{m}$  monomode fiber using a wave length of 1310 nm.

The standard modules are suited for signals like PPS, PPM, IRIG-B DCLS or 10 MHz. The required supply voltage (20 - 60 V DC) is provided by a power adapter ( $V_{\text{in}}$ : 100 - 240 V AC;  $V_{\text{out}}$ : 24 V DC) which is optionally included in the scope of supply. All converter variants are equipped with a fixing clamp for 35 mm DIN mounting rails. If necessary, each of the output signals can be inverted on request.

Transmission distances of up to 2000 meters can be realized with multimode converters. A transmission distance of up to 10 kilometres can be achieved with singlemode converters.

### 6.1 LWL Converter Case

**Chassis:** Aluminium profile case  
84 mm x 71 mm x 24 mm  
(Width x Depth x Height)

**Protection Rating:** IP20

**Temperature:** 0 ... 50 °C  
**Storage Temperature:** -25 ... 70 °C

**Humidity:** max. 85%



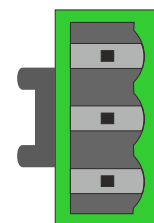
#### Power Supply

##### Input Parameter

Nominal voltage range:	$U_N = 48 \text{ V} \text{ ---}$
Maximum voltage range:	$U_{\text{max}} = 20 - 60 \text{ V} \text{ ---}$
Nominal current:	$I_N = 0.22 \text{ A}$

##### Output Parameter

Maximum power:	$P_{\text{max}} = 10 \text{ W}$
Maximum heat:	$E_{\text{therm}} = 36.01 \text{ kJ/h (34.13 BTU/h)}$

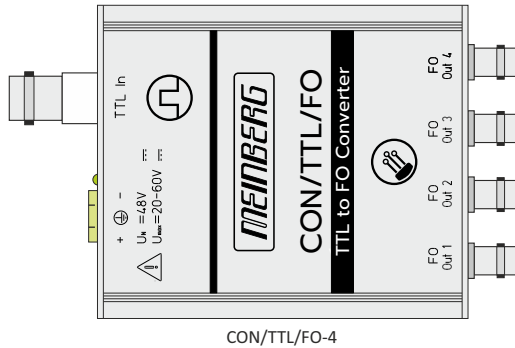


$U_N = 48 \text{ V} \text{ ---}$   
 $U_{\text{max}} = 20 - 60 \text{ V} \text{ ---}$



## 6.2 CON/TTL/FO

The fiber optic module CON/TTL/FO converts an input signal (TTL, RS-422 or FO) into one or more FO (fiber optical) output signals.



The following options are possible:

- 1.) CON/TTL/FO: TTL input via BNC connector to one FO output
- 2.) CON/TTL/FO-x: TTL input (BNC female) to x (2, 3 or 4) FO outputs
- 3.) CON/422/FO: RS-422 input via 9pin DSub connector to one FO output
- 4.) CON/422/FO-x: RS-422 input (DSub) to x (2, 3 or 4) FO outputs
- 5.) CON/FO/FO-x: FO input (ST) to x (2, 3 or 4) FO outputs

### 6.2.1 Technical Specifications CON/TTL/FO

Input Signal: TTL signal via BNC female connector  
input impedance 10 k $\Omega$

Optical Outputs: up to four multimode FO outputs via ST connectors  
active high (optional inverted)  
for GI 50/125  $\mu\text{m}$  or GI 62,5/125  $\mu\text{m}$  gradient fiber

Launchable output Power: typ. 15  $\mu\text{W}$  per output (into GI 50/125  $\mu\text{m}$  gradient fiber)

Wave Length: 850 nm

CLASS 1 LED PRODUCT 

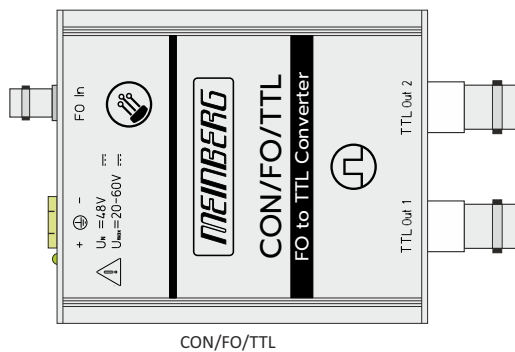
Signal Delay: Delay of the electrical slope, detected with CON/TTL/FO and CON/FO/TTL:  
- rising edge: 45 ns  
- falling edge: 45 ns  
(plus the delay caused by the optical fiber: approx. 4,9 ns/m)

Data Rate: max. 20 MHz

Signal jitter: <1 ns

## 6.3 CON/FO/TTL

The fiber optic module CON/FO/TTL converts a FO (fiber optical) input signal into one or more electrical output signals (TTL or RS-422).



The following options are possible:

CON/FO/TTL:  
two TTL outputs via BNC connector

CON/FO/422:  
one RS-422 output via 9pin DSub connector

CON/FO/TTL/422:  
one TTL output (BNC female) and one RS-422 output (DSub)

### 6.3.1 Technical Specifications CON/FO/TTL

optical

Input: 1 x multimode FO input via ST connector  
(for GI 50/125  $\mu\text{m}$  or GI 62,5/125  $\mu\text{m}$  gradient fiber)

optical

input level: min. 3  $\mu\text{W}$

Wave length: 850 nm

electrical

Outputs: TTL output signal via female BNC connector  
RS-422 output signal via female 9pin DSub connector  
(Pin7: +OUT, Pin8: -OUT)

Signal delay: Delay of the electrical slope, detected with  
CON/TTL/FO and CON/FO/TTL:  
- rising edge: 45 ns  
- falling edge: 45 ns  
(plus the delay caused by the optical fiber: approx. 4,9 ns/m)

Data Rate: max. 20 MHz

Signal Jitter: <1 ns

## 6.4 CON/232/FO

The fiber optic module CON/232/FO converts a RS-232 signal (TxD and RxD) into optical signals.

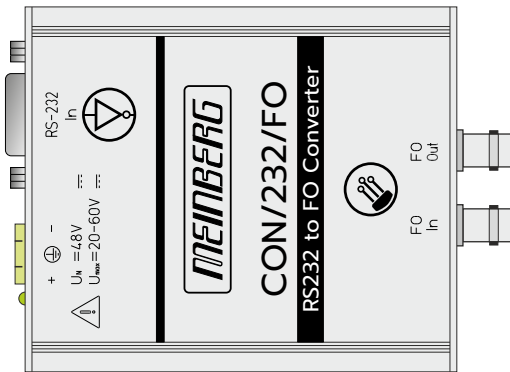
### Standard variants (for RxD and TxD)

CON/232/FO: RS-232 (DB9 male) to 1 x FO In and 1 x FO Out

### Variants (TxD only), also as diplexer

CON/232/FO-1: TxD In (DB9 male) to 1 x FO Out

Optional up to 4 x FO Out: CON/.../FO-x /Output



CON/232/FO (RxD)

### 6.4.1 Technical Specifications CON/232/FO

#### Electrical

signals: RS-232 input/output (TxD, RxD) via male DSub9 connector (Pin 2: TxD in, Pin 3: RxD out, Pin 5: GND)  
or  
RS-232 input (TxD only) via male DSub9 connector (Pin 2: TxD in, Pin 5: GND)

#### Optical

Signals: 1 multimode FO output (TxD) and 1 x FO input (RxD) or up to four multimode FO outputs via ST connectors (for GI 50/125  $\mu\text{m}$  or GI 62,5/125  $\mu\text{m}$  gradient fiber)

#### Launchable

output power: typ. 15  $\mu\text{W}$  per output (into GI 62,5/125  $\mu\text{m}$  gradient fiber)

#### Optical

input level: min. 3  $\mu\text{W}$

#### Wave length:

850 nm

#### Signal delay:

delay of a RS-232 signal: 1  $\mu\text{s}$   
data rate: 120 kbps  
(detected with two CON/232/FO)

CLASS 1 LED PRODUCT



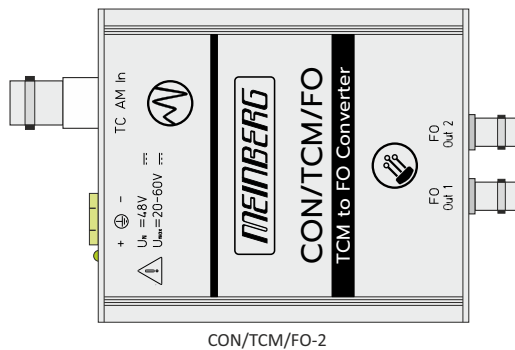
## 6.5 CON/TCM/FO und CON/FO/TCM

These fiber optic modules carry an amplitude modulated Time Code AM signal over an optical fiber.  
Signal delay: 60  $\mu$ s

**Variant to convert a Time Code AM signal to FO**  
CON/TCM/FO: Time Code In (BNC) to 2 x FO Out

**Variant to back-convert the FO signal to Time Code AM**

CON/FO/TCM: FO In to 2 x Time Code Out (BNC)



### 6.5.1 Technical Specifications CON/TCM/FO

**Input:** amplitude modulated IRIG-B, IEEE1344 or AFNOR signal, input insulated by transformer, impedance: 50 Ohm, via female BNC connector

**Input level:** 600 mV<sub>pp</sub> to 8 V<sub>pp</sub> (Mark)

**optical Outputs:** 2 multimode FO outputs via ST connectors (for GI 50/125  $\mu$ m or GI 62,5/125  $\mu$ m gradient fiber)

**Launchable output power:** typ. 15  $\mu$ W per output (into GI 62,5/125  $\mu$ m gradient fiber)

**Wave length:** 850 nm

**Signal delay:** Delay of a Time Code signal: 60  $\mu$ s  
transfer rate (sine wave carrier): 1 kHz  
(detected with CON/TCM/FO and CON/FO/TCM)

CLASS 1 LED PRODUCT



## 6.6 CON/TTL/FOS

The fiber optic module CON/TTL/FOS converts an input signal (TTL, RS-422 or FO) into one or more FO (fiber optical) output signals for single mode.

### Standard variants

PPS, PPM, IRIG-B DCLS, 10 MHz

CON/TTL/FOS:

TTL In (BNC) to 1 x FO Out

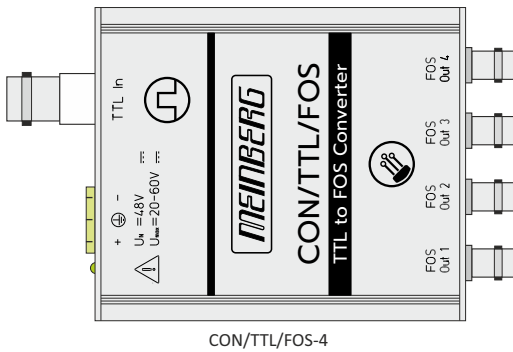
CON/422/FOS:

RS-422 In (DB9 male) to 1 x FO Out

CON/FOS/FOS:

FO In to 1 x FO Out

**Option:** up to 4 x FO Out



### 6.6.1 Technical Specification CON/TTL/FOS

Input Signal:	TTL	signal via BNC female connector input impedance 10 kOhm
	or RS-422	signal via DSub9 male connector pin 5: GND, pin 7: +IN, pin 8: -IN
	or FOS	singlemode FO signal via ST connector minimum input level: 1 $\mu$ W (-30 dBm), wave length: 1310 nm
	or FO	FO multimode FO signal via ST connector minimum input level: 3 $\mu$ W (-25 dBm), wave length: 850 nm

Optical Outputs: up to four singlemode FOS outputs via ST connectors for E9/125 $\mu$ m monomode fiber, wave length: 1310 nm

Launchable output power: typ. 15  $\mu$ W (-18 bBm) per output

Signal Delay: Delay of the electrical slope, detected with CON/TTL/FOS and CON/FOS/TTL:  
 rising edge: 75 ns  
 falling edge: 70 ns  
 (plus the delay caused by the optical fiber: approx. 4,9 ns/m)

Data Rate max. 10 MHz

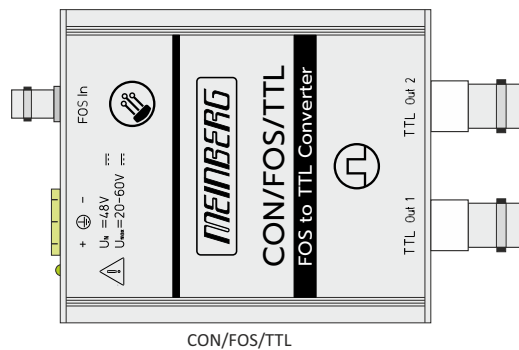
Signal Jitter: <1 ns

CLASS 1 LED PRODUCT



## 6.7 CON/FOS/TTL

The fiber optic module CON/FOS/TTL converts a single mode FO input signal into one or more electrical output signals (TTL or RS-422).



### Standard Varianten

PPS, PPM, IRIG-B DCLS, 10 MHz

CON/FOS/TTL:

FO In to 2 x TTL Out (BNC female)

CON/FOS/422:

FO In to 1 x RS-422 Out (DB9 female)

CON/FOS/TTL/422:

FO In to 1 x RS-422 and 1 x TTL

### 6.7.1 Technical Specification CON/FOS/TTL

**Input Signal:** one singlemode FO input via ST connector, edge-triggered for E9/125  $\mu\text{m}$  monomode fiber  
minimum input level: 1  $\mu\text{W}$  (-30dBm), wave length: 1310 nm

**Electrical**

**Outputs:** 2 x TTL signal via BNC female connectors  
2.5 V into 50 Ohm  
or  
1 x RS422 signal via DSub9 female connector  
pin 5: GND, pin 7: +IN, pin 8: -IN

**Signal Delay:** Delay of the electrical slope, detected with CON/TTL/FOS and CON/FOS/TTL:  
rising edge: 75 ns  
falling edge: 70 ns  
(plus the delay caused by the optical fiber: approx. 4,9 ns/m)

**Data Rate:** max. 10 MHz

**Signal-Jitter:** <1 ns



## 7 RoHS Conformity

### Conformity with EU Directive 2011/65/EU (RoHS)

We hereby declare that this product is compliant with the European Union Directive 2011/65/EU and its delegated directive 2015/863/EU "Restrictions of Hazardous Substances in Electrical and Electronic Equipment".

We warrant that our electrical and electronic products sold in the EU do not contain lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyls (PBBs), polybrominated diphenyl ethers (PBDEs), bis(2-ethylhexyl)phthalat (DEHP), benzyl butyl phthalate (BBP), dibutyl phthalate (DBP), or diisobutyl phthalate (DIBP) above the legal limits.





## EU-Declaration of Conformity

Doc ID: FO-/FOS-CONVERTER-April 17, 2023

Diese EU-Konformitätserklärung umfasst alle nachfolgend aufgeführten Gerätekonfigurationen:  
*This UKCA Declaration of Conformity further covers all the device configurations listed below:*

CONVERTER	CON/TTL/FO
	CON/FO/TTL
	CON/232/FO
	CON/TCM/FO
	CON/FO/TCM
	CON/TTL/FOS
	CON/FOS/TTL

Bad Pyrmont, den April 17, 2023

  
Stephan Meinberg  
Production Manager

## 9 Declaration of Conformity for Operation in the United Kingdom

### UKCA Declaration of Conformity

Doc ID: FO-/FOS-CONVERTER-April 17, 2023

**Manufacturer** Meinberg Funkuhren GmbH & Co. KG  
Lange Wand 9  
31812 Bad Pyrmont  
Germany

*declares that the product*

**Product Designation** FO-/FOS-CONVERTER

*to which this declaration relates, is in conformity with the following standards and provisions of the following regulations under British law:*

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Electromagnetic Compatibility Regulations 2016 (as amended) <i>SI 2016/1091</i>	EN IEC 61000-6-2:2019 EN IEC 61000-6-3:2021 EN 55035:2017/A11:2020 EN 55032:2015 + AC:2016 + A11:2020 + A1:2020
Electrical Equipment (Safety) Regulations 2016 (as amended) <i>SI 2016/1101</i>	EN IEC 62368-1:2020/A11:2020
The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012 (as amended) <i>SI 2012/3032</i>	EN IEC 63000:2018

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## UKCA Declaration of Conformity

Doc ID: FO-/FOS-CONVERTER-April 17, 2023

*This UKCA Declaration of Conformity further covers all the device configurations listed below:*

CONVERTER	CON/TTL/FO
	CON/FO/TTL
	CON/232/FO
	CON/TCM/FO
	CON/FO/TCM
	CON/TTL/FOS
	CON/FOS/TTL

Bad Pyrmont, Germany, dated April 17, 2023

  
Stephan Meinberg  
Production Manager