

OPERATING MANUAL



MC-1.1+

AES3 – AES3id – S/P-DIF Digital Audio Format Converter



SAFETY INSTRUCTIONS

General instructions

To reduce the risk of fire or electrical shock, do not expose this appliance to rain or moisture, direct sunlight or excessive heat from sources such as radiators or spotlights. No user serviceable parts are inside. Repair and maintenance must be carried out by qualified personnel authorized by MUTECH GmbH! The unit has been designed for operation in a standard domestic environment. Do NOT expose the unit and its accessories to rain, moisture, direct sunlight or excessive heat produced by such heat sources as radiators or spotlights! The free flow of air inside and around the unit must always be ensured.



Initial operation

Prior to the initial operation of the unit, the appliance, its accessories and packaging must be inspected for any signs of physical damage that may have occurred during transit. If the unit has been damaged mechanically or if liquids have been spilled inside the enclosure, the appliance may not be connected to the mains or must be disconnected from the mains immediately! If the unit is damaged, please do NOT return it to MUTECH GmbH, but notify your dealer and the shipping company immediately, otherwise claims for damage or replacement may not be granted.

If the device is left in a low-temperature environment for a long time and then is moved to a room-temperature environment, condensation may occur on the inside and the exterior. To avoid short-circuits and flashovers, be sure to wait one or two hours before putting the device into operation.

Power supply

The device contains a self-adapting wide-range power supply supporting the majority of global standard line voltages within a range of 90...250 V, with no need for making adjustments. Make sure that your line-voltage source provides a supply voltage within the specified range. In addition, make sure that the device is properly grounded via the local electric installation.

Please use the enclosed power cord (see packaging) to connect the unit to the mains. Switch the unit off before you attempt to connect it to the mains. Connect the power cord to the unit, then to a standard 3-pin mains outlet. To draw the power cord, never pull on the cable but on the mains plug!

The unit must be grounded during operation!

For information on the power-inlet wiring, refer to the »Wiring of connectors« section in the appendix. Disconnect the device from the mains when not using it for an extended period!



This symbol, a flash of lightning inside a triangle, alerts you to the presence of uninsulated dangerous voltage inside the enclosure - voltage that may be sufficient to constitute a risk of shock.



This symbol, an exclamation mark inside a triangle, alerts you to important operating or safety instructions in this manual.

Declaration of Conformity

We herewith confirm that the product complies with the European Commission's standards on electromagnetic compatibility.

Interference emission: EN 50081-1, 1992
Resistance to interference: EN 50082-1, 1992

Presupposed as operation condition is that all clock outputs are connected with high-quality and good shielded BNC 75 ohms cable.



WARRANTY REGULATIONS

§1 Warranty

MUTECH GmbH warrants the flawless performance of this product to the original buyer for a period of two (2) years from the date of purchase. If any failure occurs within the specified warranty period that is caused by defects in material and/or workmanship, MUTECH GmbH shall either repair or replace the product free of charge within 90 days. The purchaser is not entitled to claim an inspection of the device free of charge during the warranty period. If the warranty claim proves to be justified, the product will be returned freight prepaid by MUTECH GmbH within Germany. Outside Germany, the product will be returned with the additional international freight charges payable by the customer. Warranty claims other than those indicated above are expressly excluded.

§2 Warranty transferability

This warranty is extended exclusively to the original buyer who bought the product from a MUTECH GmbH specialized dealer or distributor, and is not transferable to anyone who may subsequently purchase this product. No other person (retail dealer, distributor, etc.) shall be entitled to give any warranty promise on behalf of MUTECH GmbH.

§3 Warranty regulations

The return of the completed registration card, or online registration on one of the websites specified below, is a condition of warranty. Failing to register the device before returning it for repair will void the extended warranty.

- The serial number on the returned device must match the one stated on the registration card or entered during online registration. Otherwise, the device will be returned to the sender at the sender's expense.
- Any returned device must be accompanied by a detailed error description and a copy of the original sales receipt issued by a MUTECH dealer or distributor.
- The device must be returned free of shipping expenses and in the original package, if possible; otherwise, the sender has to provide comparably protective packaging.
- The sender is fully responsible for any damage or loss of the product when shipping it to MUTECH GmbH.

§4 Limitation of warranty

Damages caused by the following conditions are not covered by this warranty:

- Damages caused by every kind of normal wear and tear (e.g. displays, LEDs, potentiometers, faders, switches, buttons, connecting elements, printed labels, cover glasses, cover prints, and similar parts).
- Functional failure of the product caused by improper installation (please observe CMOS components handling instructions!), neglect or misuse of the product, e.g. failure to operate the unit in compliance with the instructions given in the user or service manuals.
- Damage caused by any form of external mechanical impact or modification.
- Damage caused by the user's failure to connect and operate the unit in compliance with local safety regulations.
- Damage caused by force majeure (fire, explosion, flood, lightning, war, vandalism, etc.).
- Consequential damages or defects in products from other manufacturers as well as any costs resulting from a loss of production.

Repairs carried out by personnel which is not authorized from MUTECH GmbH will void the warranty. Adaptations and modifications to the device made with regard to national, technical, or safety regulations in a country or of the customer do not constitute a warranty claim and should be set with MUTECH GmbH in advance.

§5 Repairs

To obtain warranty service, the buyer must call or write to MUTECH GmbH before returning the unit. All inquiries must be accompanied by a description of the problem and the original buyer's invoice. Devices shipped to MUTECH GmbH for repair without prior notice will be returned to the sender at the sender's expense. In case of a functional failure please contact:

MUTECH Gesellschaft fuer Systementwicklung und Komponentenvertrieb mbH

Siekeweg 6/8 • 12309 Berlin • Germany • Fon 030-746880-0 • Fax 030-746880-99 • Tecsupport@MUTECH-net.de • www.MUTECH-net.de

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■ CONTENT

■ INTRODUCTION

General Function Description	7
Features	7
Applications.	7
Peripheral MUTECH Products	8

■ CONTROL ELEMENTS AND TERMINALS

MC-1.1+ Front Panel	9
MC-1.1+ Rear Panel.	9

■ INSTALLATION

Content of the Box	11
Placing the device	11
Wiring the AES/EBU, AES/EBUid and S/P-DIF Interfaces	11

■ OPERATION

Selecting Function Menus and setting Functions	13
Steps of Operation	13

■ OPERATING THE MC-6

MODE+ AUDIO IN + SCMS Menus	15
General Operation Procedure	15
Unidirectional Format Conversions	16
Unidirectional Format and Sampling Rate Conversions	16
Signal Splitting Mode	17
SCMS Functions.	18
STATUS Area	18

■ APPENDIX

Pin Assignment of the Connectors	19
Technical Data	20

Peripheral MUTEK Products

Format and Sampling Rate Converters with internal Master Clock:

- MC-4
The MC-4 is a high-performance digital audio multichannel format and sampling rate converter for ADAT™, AES3 and S/P-DIF
- MC-6
The MC-6 is a high-performance digital audio dual channel format converter for AES3, AES3id and S/P-DIF.
- MC-8 + MC-8.1
The MC-8 and MC-8.1 are 8 channel, high-performance digital audio and sampling rate converters for AES3 and AES3id.

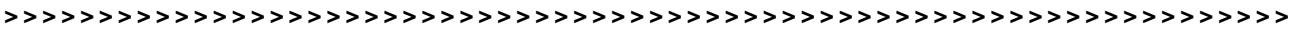
Digital Signal Distribution Amplifier:

- MC-2
The MC-2 is a high-performance digital audio and reference sync signal distribution amplifier for AES3/11 and AES3/11id signals. The unit distributes and converts between the mentioned AES signals and standards.

Accessories for the MUTEK MC Product Series:

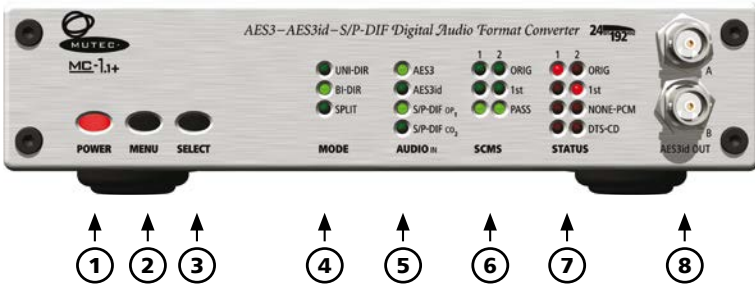
- Optical cables in different lengths from 0.5 m to 20m for S/P-DIF and ADAT™ transfers.
- MW-02/19
Mounting plate to install two MC products side by side into one unit of a 19" rack.
- MW-03/19
Set of two rack mounting angles to install one MC product on the rear side of a 19" rack.
- MW-05/19
Set of two rack mounting angles to install one MC product frontally into one unit of a 19" rack.

For all peripheral products please have a look on our website:
www.MUTEK-net.com



CONTROL ELEMENTS AND TERMINALS

MC-1.1+ Front Panel



- 1 POWER**
This red LED lights up when the unit is switched on with the rear panel POWER switch.
- 2 SELECT**
Use this key to access the different functional menus.
- 3 DATA**
Use this key to select a function from a specific functional menu.
- 4 MODE**
This function menu allows to select all digital audio format conversion modes available.
- 5 AUDIO IN**
This function menu allows to select the digital audio formats for conversion.
- 6 SCMS**
This function menu offers three different ways to encode the outgoing S/P-DIF optical and coaxial digital audio signals.
- 7 STATUS**
This menu indicates various signal statuses of incoming S/P-DIF optical or coaxial digital audio signals by means of status LEDs.
- 8 AES3id OUT**
These two outputs transmit two AES3id digital audio stereo or blank frame signals in compliance with the AES3id-2001 or AES 11-1997/2003 standards. The output impedance is 75Ω (BNC connectors, female).

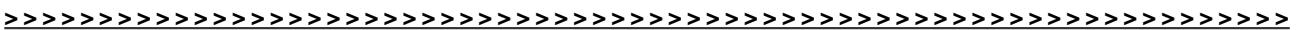
Refer to the OPERATIONS chapter for more information.

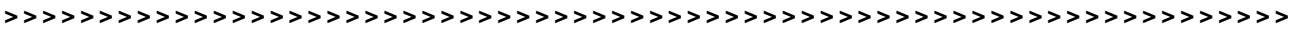
MC-1.1+ Rear Panel



- 1 S/P-DIF OUT**
These four S/P-DIF outputs, available as 2 x optical (»OP«) and 2 x coaxial (»CO«) interfaces, transmit an optical S/P-DIF and an unbalanced electrical S/P-DIF digital audio or blank frame signal in compliance with the IEC 60958 standard. The coaxial interface impedance is 75Ω. (cinch connector), the optical interface offers a Toshiba Toslink™ connector, EIAJ standard.
- 2 AES3/11 OUT**
These two outputs transmit a balanced digital AES3 audio or AES11 blank frame signal compliant with AES3-1992 (R1997) and AES 11-1997/2003. The output impedance is 110Ω (XLR connectors, male).

For detailed specifications on all terminals, refer to the »Pin Assignment of the Connectors« and »Technical Data« in the chapter APPENDIX.





INSTALLATION

Content of the Box

The unit was packed carefully. Nevertheless we recommend to check the content directly after opening the package:

- 1 x MC-1.1+
- 1 x Power cable
- 1 x Manual

Placing the Device

The unit should be set up as closely as possible to the devices to which it will be connected, so as to avoid excessive cable lengths. Use the 4 rubber feet enclosed with the appliance and stick them symmetrically on the bottom side of the unit to protect the enclosure and supporting surface from being damaged.

The device can be mounted into a standard 19" rack and will require 1 unit. In this case, the rubber feet cannot be attached. Install the device so that one unit of rack space is left free both above and below the device to allow for sufficient ventilation! The mounting depth including the terminals is 160 mm/6.7". Another 60 mm/2.4" should be added for the required cables.


Additional slide-in rails on the rack inside are recommended for safe installation. This will also avoid long-term mechanical deformation of the housing.


Wiring the AES/EBU and S/P-DIF Interfaces


Connect the AES/EBU interfaces with the help of balanced electrical cables equipped with XLR connectors on both ends. The specifications stipulate a specific cable resistance of 110Ω (ask your retailer for a confirmation of this value when purchasing the cables).

Connect the coaxial S/P-DIF interface with the help of unbalanced electrical cables equipped with cinch connectors on both ends. The specifications stipulate a specific cable resistance of 75Ω (ask your retailer for a confirmation of this value when purchasing the cables).

The condition of the packaging material and the device should be checked carefully additionally. If there are any damages please refer to SAFETY INSTRUCTIONS, Initial Operation, and WARRANTY REGULATIONS.

 **Before installing the unit the section SAFETY INSTRUCTIONS located at the beginning of this manual should be read carefully.**

 **Never expose the device and accessories to rain, moisture, direct sunlight, or excessive heat produced by radiators, heaters, or spot lights! Sufficient air circulation in the environment of the device must be ensured!**

 **Especially when working with high AES3/11 clock rates well shielded clock lines are imperative to avoid increased radiation! Standard cables are normally useable for clock rates up to 50.0kHz. Special shielded cable material should be used for transfer of higher clock rates.**

Since some manufacturers offer optimized cables for the transmission of digital S/P-DIF and AES3/11 signals, it is a good idea to ask your retailer for specific cables.

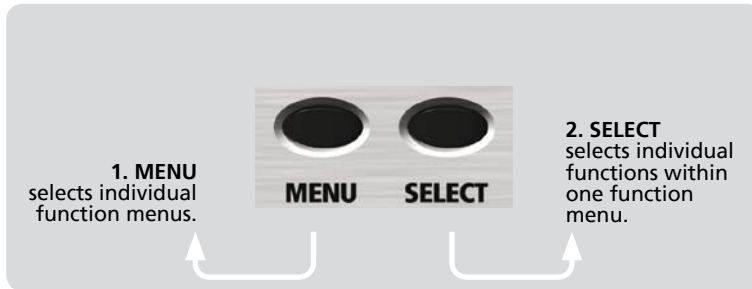


OPERATION

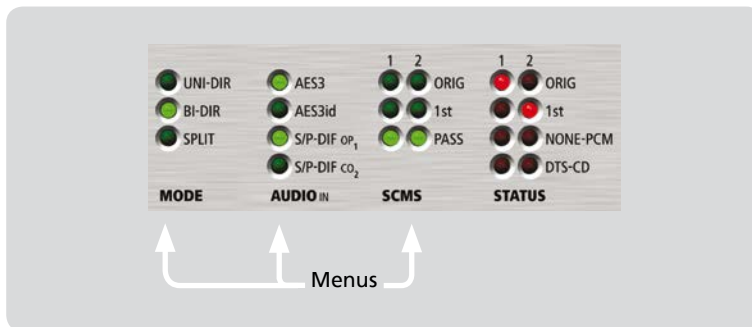
Selecting Function Menus and setting Functions

The device is fully operated using the two toggle switches at the front panel.

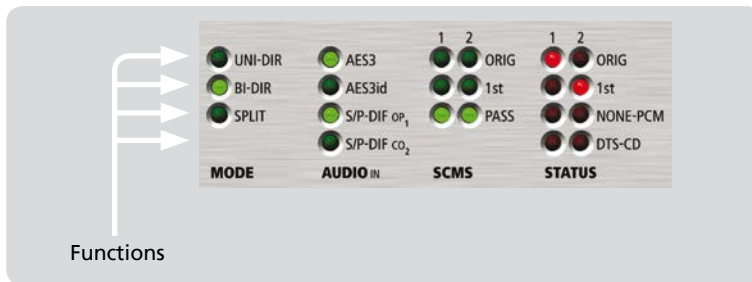
- 1 Switching the MENU key toggles between different basic function menus.
- 2 Switching the SELECT key activates individual functions within one function menu.



MENU + SELECT operation



Menus



Functions

Steps of Operation

- 1 First press on »MENU« or »SELECT« key enables the last selected function within the last selected function menu. The corresponding LED is beginning to flash.
- 2 Every press on »SELECT« button will select a new function within a menu. The LED of the selected function flashes accordingly. After the LED stops flashing, the function is activated.
- 3 When the needed function is selected, do not press the switches again! After a period of approx. 4 seconds the LED of the selected function stops flashing.

The STATUS area is not accessible by using the »MENU« and »SELECT« keys, because it only informs about different conditions of incoming signals.



Safety Instructions

For safety reasons, be sure to read the SAFETY INSTRUCTIONS and INSTALLATION chapters before first powering-up!
We also recommend reading the CONTROL ELEMENTS AND TERMINALS chapter for information on how to connect MC-1.1+!



Shut-Down of Outputs

All digital audio outputs are shut-down during function selection!
After a function is finally selected and the corresponding LED lights constantly again, the digital audio outputs are activated for signal transfer.



User Settings Remain

All user-specific function settings are available furthermore when power is restored.



OPERATING THE MC-1.1+

MODE + AUDIO IN + SCMS Menus

These three function menus are offering access to the whole functionality of your MC-1.1+.


The »MODE« menu allows to select the general conversion option as uni- or bidirectional conversion or the signal splitting mode.

Within the »AUDIO IN« menu you select for the digital audio formats which should be converted. This menu acts in dependency of the »MODE« menu. The system makes sure that only useful combinations of conversion modes and proper audio formats are accessible. Therefore both menus act together in different combinations.

The SCMS« menu (SCMS = Serial Copy Management System) let you encode the S/P-DIF optical + coaxial output signals with three different SCMS status.

The menu »STATUS« is for control of the S/P-DIF inputs only. It is not accessible for adjustments.

Shut-Down of Outputs

 All digital audio outputs are shut-down during function selection! After a function is finally selected and the corresponding LED lights constantly again, the digital audio outputs are activated for signal transfer.

General Operation Procedure

The menu of your MC-1.1+ is strictly organized aligned to general handling procedures when inserting the MC-1.1+ into your studio's data stream. Thus, you can split up all of the necessary adjustments in three steps, which leads to the following three questions for the basic operation of your MC-1.1+:

1) What kind of conversion should be executed → MODE?

- UNI-DIR** = Unidirectional conversion, from one format to all others
 - BI-DIR** = Bidirectional conversion, between two formats only
 - SPLIT** = Signal splitting only
- MODE**

2) Which digital audio format(s) should be involved as source(s) → AUDIO IN?

- AES3** = AES3 between 25.0kHz and 200.0kHz
 - AES3id** = AES3id between 25.0kHz and 200.0kHz
 - S/P-DIF op₁** = S/P-DIF optical between 25.0kHz and 200.0kHz
 - S/P-DIF co₂** = S/P-DIF coaxial between 25.0kHz and 200.0kHz
- AUDIO IN**

3) Which SCMS status is required for the S/P-DIF output signals → SCMS?

- ¹ ² **ORIG** = SCMS status as »original«
 - 1st** = SCMS status as »first copy«
 - PASS** = SCMS status of the S/P-DIF input signal is looped through
- SCMS**

After these general decisions are made, your MC-1.1+ is configured for optimal operation in your set-up! Due to the fact that the system monitors for useful function combinations, maloperation is not possible.

So, let's have a look to the individual functions on the next pages.

OPERATION

When activating a bidirectional conversion option which includes a S/P-DIF input, the SCMS status of the involved S/P-DIF output can be selected in the »SCMS« menu. The »STATUS« menu shows the SCMS, PCM and DTS status of the incoming S/P-DIF signal.

When activating a bidirectional conversion option which includes both available S/P-DIF inputs, the SCMS status of both S/P-DIF outputs can be selected in the »SCMS« menu. Therefore, both S/P-DIF inputs are marked with »1« and »2«. You find this numbering above of the two LED rows of the »SCMS« and »STATUS« sections. Thus, the SCMS status of the S/P-DIF optical output is selected with LED row»1« and the SCMS status of the S/P-DIF coaxial output is selected with LED row»2«.

Correspondingly to this numbering, the »STATUS« menu indicates the SCMS, PCM and DTS status of the incoming S/P-DIF signals.

Further Setting Examples

<input type="radio"/> UNI-DIR	<input checked="" type="radio"/> AES3	<input checked="" type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> ORIG	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> ORIG
<input checked="" type="radio"/> BI-DIR	<input type="radio"/> AES3id	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 1st	<input checked="" type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 1st
<input type="radio"/> SPLIT	<input type="radio"/> S/P-DIF op ₁	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> PASS	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> NONE-PCM
	<input checked="" type="radio"/> S/P-DIF co ₂				<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> DTS-CD
MODE	AUDIO IN	SCMS		STATUS			

Bidirectional format conversion between AES3 and S/P-DIF coaxial. The SCMS status of the S/P-DIF coaxial output is set to original. The SCMS status of the S/P-DIF input signal is first copy.

<input type="radio"/> UNI-DIR	<input type="radio"/> AES3	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> ORIG	<input checked="" type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> ORIG
<input checked="" type="radio"/> BI-DIR	<input type="radio"/> AES3id	<input checked="" type="radio"/> 1	<input checked="" type="radio"/> 2	<input type="radio"/> 1st	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 1st
<input type="radio"/> SPLIT	<input checked="" type="radio"/> S/P-DIF op ₁	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> PASS	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> NONE-PCM
	<input checked="" type="radio"/> S/P-DIF co ₂				<input type="radio"/> 1	<input checked="" type="radio"/> 2	<input type="radio"/> DTS-CD
MODE	AUDIO IN	SCMS		STATUS			

Bidirectional format conversion between S/P-DIF optical and S/P-DIF coaxial. The SCMS status of both S/P-DIF outputs is set to first copy. The status of the S/P-DIF optical input signal is original, the status of the S/P-DIF coaxial input shows a DTS-CD coding.

Signal Splitting Mode

<input type="radio"/> UNI-DIR	<input type="radio"/> AES3	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> ORIG	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> ORIG
<input type="radio"/> BI-DIR	<input type="radio"/> AES3id	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 1st	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 1st
<input checked="" type="radio"/> SPLIT	<input type="radio"/> S/P-DIF op ₁	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> PASS	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> NONE-PCM
	<input type="radio"/> S/P-DIF co ₂				<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> DTS-CD
MODE	AUDIO IN	SCMS		STATUS			

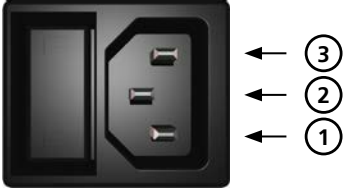
This is also a special function of your MC-1.1+! It allows to actively split and distribute up to four input signals to their corresponding double outputs. That means, every input signal is transferred to two format-same outputs. Thus, your MC-1.1+ works as a 4-way digital audio signal splitter. In this mode, the MC-1.1+ accepts different sampling rates at every digital audio input.



APPENDIX

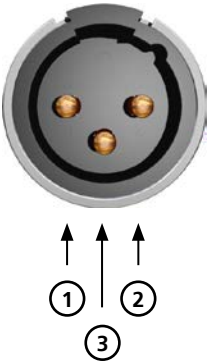
Pin Assignment of the Connectors

Mains



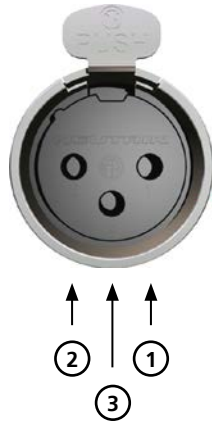
- 1 Neutral (blue; USA: white)
- 2 Protective earth (green/yellow; USA: green)
- 3 Live, phase (brown; USA: black)

AES/EBU XLR Output



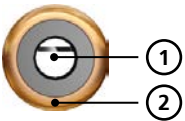
- 1 Audio ground
- 2 a conductor (hot / +)
- 3 b conductor (cold / -)

AES/EBU XLR Input



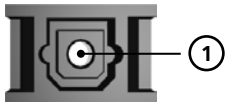
- 1 Audio ground
- 2 a conductor (hot / +)
- 3 b conductor (cold / -)

S/PDIF Cinch Input/Output



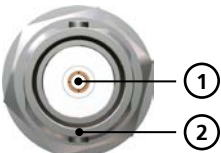
- 1 Audio signal
- 2 Audio ground

S/PDIF Optical Input/Output TOSLINK Standard



- 1 Optical signal

BNC Input/Output for AES3id



- 1 Signal
- 2 Ground

