

OPERATING MANUAL



MC-1

UNI-DIRECTIONAL DIGITAL AUDIO FORMAT CONVERTER



MC-1.1

BI-DIRECTIONAL DIGITAL AUDIO FORMAT CONVERTER

SMART
DIGITAL



WWW.MUTEC-NET.DE

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
Siekweg 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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CONTENTS

INTRODUCTION

About this Manual	7
General Function Description	7
MC-1 and MC-1.1 common Features.	7
Additional Features for MC-1.1	8
Applications.	8

CONTROL ELEMENTS

MC-1 + MC-1.1 Front Panels	9
MC-1 + MC-1.1 Rear Panels	9

INSTALLATION

Content of the Box	11
Placing the device	11
Wiring the AES/EBU and S/PDIF Interfaces	11

OPERATION

Selecting Function Areas and setting Functions.	13
Steps of Operation	13
MODE Function Area	14
S/PDIF OP → S/PDIF OP, S/PDIF CO, AES/EBU	14
S/PDIF CO → S/PDIF OP, S/PDIF CO, AES/EBU	14
AES/EBU → S/PDIF OP, S/PDIF CO, AES/EBU.	14
OPTICAL ↔ SYMMETRICAL.	14
S/PDIF OP ↔ AES/EBU (only MC-1.1)	14
S/PDIF CO ↔ AES/EBU (only MC-1.1)	15
DISTRIBUTION (only MC-1.1)	15
SCMS Function Area	15
ORIG.	15
1st	15
PASS	16
NONE	16
STATUS Area	16
ORIG.	16
1st	16
NONE-PCM	16
DTS-CD	16

APPENDIX

Pin Assignment of the Connectors	17
Technical Data	18

INTRODUCTION

Additional Features for MC-1.1

- Bi-directional format conversion from 32kHz to 192kHz between S/PDIF and AES3/AES11.
- ADAT™ signal splitting + line extension.
- S/PDIF optical/coaxial + AES/EBU signal splitting.
- S/PDIF, AES/EBU and ADAT™ signal distribution.

Applications

- Interconnection of consumer and professional digital audio devices.
- Realtime bi-directional signal transfer and format conversion between send/returns of digital mixing consoles and effect processors.
- Uni- or bi-directional interconnection of computer-based sound cards with professional digital audio equipment.
- S/PDIF, AES3 and AES11 signal splitting and distribution.
- Distance extension for ADAT™ and S/PDIF optical signals through symmetrical AES/EBU lines for e.g. theater or broadcast installations.
- Digital audio signal refreshing.
- SCMS coding of digital audio productions to protect those against illegal copying.
- S/PDIF optical/coaxial status analyzing.





CONTROL ELEMENTS

MC-1 + MC-1.1 Front Panels



MC-1 Front Panel



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**
The toggle switch selects one of the two functional areas available.
- 3 DATA**
Use this toggle switch to select a function from a specific functional area.
- 4 MODE**
This function area includes all digital audio format conversion modes available.
- 5 SCMS**
This function area offers four different ways to encode the outgoing S/PDIF optical and coaxial digital audio signals.
- 6 STATUS**
This area indicates various signal statuses of incoming S/PDIF optical or coaxial digital audio signals by means of status LEDs.

Refer to the OPERATIONS chapter for more information.

MC-1 + MC-1.1 Rear Panels



MC-1 Rear Panel



MC-1.1 Rear Panel



- 1 S/PDIF OP OUT**
These outputs transmit digital S/PDIF audio signals (optical) in accordance with the specifications of the standard IEC 60958 or ADAT™ signals (Toshiba Toslink™ connector, EIAJ standard).
Double S/PDIF optical outputs for signal splitting and distribution are available at MC-1.1 only.



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 or MC-1.1
- 1 x Power cable
- 4 x Rubber feet
- 1 x Manual
- 1 x Registration card

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/PDIF 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/PDIF 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 AES/EBU 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/PDIF and AES/EBU audio signals, it will be a good idea to ask your retailer for specific cables.

INSTALLATION



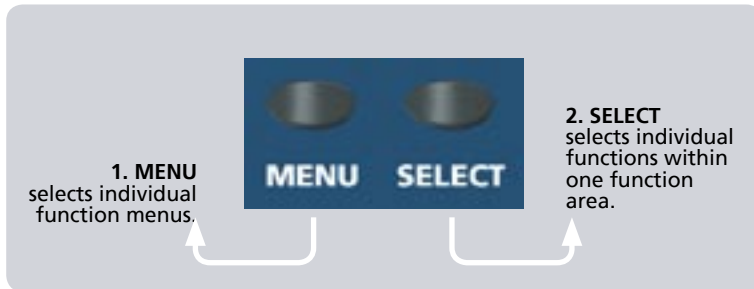
OPERATION

Selecting Function Areas and setting Functions

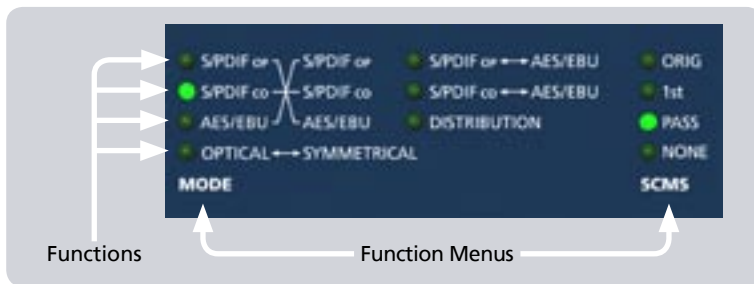
The device is fully operated using the two toggle switches at the front panel.

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

! For safety reasons, be sure to read the **SAFETY INSTRUCTIONS** and **INSTALLATION** chapters before first powering-up!
 We also recommend reading the **CONTROLS AND TERMINALS** chapter for information on how to connect MC-1 or MC-1.1!



MENU + SELECT operation



Function Areas + 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 key will select a new function. The LED of every selected function will flash accordingly and the corresponding function is available at once.
- 3 When the needed function is selected, do not press the switches again! After a period of approx. 4 seconds the LED in front of the selected function will stop flashing.

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

The STATUS area is not accessible by using the SELECT and DATA switches, because it only informs about different conditions of incoming digital audio signals.

OPERATION

S/PDIF co ↔ AES/EBU (only MC-1.1)

This function converts an incoming S/PDIF coaxial (index »co«) reference signal to the AES/EBU output and an incoming AES/EBU reference signal to the S/PDIF coaxial output simultaneously. During this processes »real« format and electrical conversions of the S/PDIF and AES/EBU data streams will be done based on the double conversion circuitries of MC-1.1. Both signal paths can be used with different clock rates simultaneously.

The SCMS data-bits of the S/PDIF coaxial output can be set as described in the »SCMS Function Area« section. The factory default is PASS.

DISTRIBUTION (only MC-1.1)

This function connects all inputs directly to the outputs of their same format. In this case every supply signal is available twice at the outputs which is like a signal distribution function. During this operation the input signals will be refreshed and jitter-cleaned before being transferred to their corresponding outputs. All three signal paths can be used with different clock rates simultaneously.

Especially for the S/PDIF optical input it is also possible e.g. to input an ADAT™ signal. Thus, MC-1.1 can be used as an ADAT™ signal splitter, while distributing S/PDIF coaxial and AES/EBU signals through the other interfaces additionally.

Using DISTRIBUTION, it is not possible to set SCMS functions and to analyze the incoming data streams with help of the STATUS area.

SCMS Function Area

SCMS (Serial Copy Management System), also know as »copy protection bits«, will affect the S/PDIF data streams at the S/PDIF optical and coaxial outputs similarly. This applies not to the outgoing AES/EBU signal because the AES3 and AES11 specifications do not define any SCMS capability. Due to this, the AES/EBU output signal is free of SCMS information.

Setting SCMS functions applies basically to both S/PDIF outputs (optical + coaxial)!

ORIG

This function called »Original« sets the outgoing SCMS data-bits to indicate that the signal source is the original master and not a copy. Therefore devices which are capable of evaluating SCMS data-bits will accept those digital audio signals at their S/PDIF inputs for recording. ORIG is not available when one of the following functions is used:

- OPTICAL ↔ SYMMETRICAL
- DISTRIBUTION (only MC-1.1)

ORIG can be set no matter of the status of the incoming S/PDIF reference signal source.

1st

This function called »1st Generation« sets the outgoing SCMS data-bits to indicate that the signal source is a copy. Therefore devices which are capable of evaluating SCMS data-bits will not accept those digital audio signals at their S/PDIF inputs for recording. Due to this, valuable recordings, sounds or commercial material will be protected against illegal copying. 1st is not available when one of the following functions is used:

- OPTICAL ↔ SYMMETRICAL
- DISTRIBUTION (only MC-1.1)

1st can be set no matter of the status of the incoming S/PDIF reference signal source.



MUTEC GmbH declines any responsibility for criminal use of the SCMS functionality basically!

It is allowed to use this function exclusively to protect the musical productions of the original MC-1 and MC-1.1 owner against illegal copying by third parties and to help the owner to use his digital audio data more easily within his own studio environment.

With release of the German copyright protection law at August, 8th 2003, the use of equipment which is capable of eliminating copy protections is not allowed!

Instead of other manufacturer's converters, MC-1 and MC-1.1 are offering SCMS operation in every format conversion mode!



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