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Important Safety Instructions

- Please read this manual carefully.
- Please keep this operating manual in a safe place.
- Heed all warnings.
- Follow all instructions.
- This device may only be used in accordance to the information provided in this operating manual. Ensure that all recommendations, especially the safety recommendations as detailed in this operating manual, are followed before and during the usage of the device.
- Do not use this device near water, for example, in humid or damp rooms.
- Clean only with a dry cloth.
- Do not block or cover any ventilation slits. Install the device in accordance with the operating manual.
- Do not install or place the device near any heat source such as radiators, power-amplifiers, or any other heat producing equipment.
- Protect the power cord from being stepped on, crushed, pinched or damaged in any other way. Pay special attention to plugs and sockets of the device.
- Do not place this device on an unstable table, tripod, cart, etc. The device may fall, causing serious damage to the device.
- The device can be disconnected from the power supply by pulling the plug. These must be freely accessible at all times. The device should be disconnected during lightning storms or when unused for long periods of time.
- The device must be grounded; any disconnection of the grounding is not permitted.
- The internal components of the switched-mode power supplies operate at very high voltages. Coming into contact with them can lead to considerable electric shock, which may result in death.
- Only use attachments specified by the manufacturer.
- This device contains no user serviceable parts: only refer to authorised, qualified service personnel for any servicing.
- Your warranty will be voided if you tamper with the internal components.

- **Purchaser Information**

- **Operating Manual**

Please read this manual – if you call for technical support, we will assume that you have already done so. Study the operating manual carefully in order to familiarise yourself with the device and its operation. It contains vast amounts of information and tips for the proper use of the device.

It cannot be guaranteed that this operating manual will not contain typographical mistakes or misprints. The operating manual is regularly revised and updated.

Modifications, which serve the purpose of technical improvement of the device, may be carried out without prior notification.

- **Transport and Shipping**

Always ensure careful handling of the device. The device should be transported and shipped in shock-absorbing transport cases. If these are not available, we recommend well-padded packaging such as the coated carton in which the device was delivered.

- **Environments**

This device can be used in E1, E2, E3, E4, or E5 environments (as listed below) according to the harmonised European standards EN55103-1 and EN55103-2 "Electromagnetic compatibility – Product family standard for audio, video and audio-visual and entertainment lighting control apparatus for professional use"

E1-Residential

E2-Commercial and light industrial

E3-Urban outdoors

E4-Controlled EMC environment e.g. broadcast and TV-studio

E5-Heavy industry

The product is intended for use in moderate climates.

- **Ventilation**

Do not block or cover any ventilation openings. Install the device in accordance with the operating manual. Allow for sufficient space around the units (at least 200 mm \equiv 7,87" free space behind the rear-panel of the device) and make sure to allow for air circulation near the ventilation openings on both sides of the device. Keep the rear of the rack open during operation. Do not operate the device close to heat emitting equipment, such as power-amplifiers. Leave sufficient space (minimum ½ RU) between the device and any heat emitting devices housed in the same rack.

Please note:

Do not populate more than 4 adjacent rack spaces with Optocore devices.

Maintain 1RU of empty space between each 4 RU of Optocore devices.

Keep the equipment rack open during operation.

Ensure air circulation around the devices.

Maintain at least 200mm (~8") clearance behind the rear panel of the devices.

Support rear of the device with additional bracket (not included).

- **Water and Moisture etc.**

To prevent fire or shock hazard do not expose the device to direct sunlight, dust, water, or rain during operation or storage.

- **Cleaning**

Only use a dry linen cloth to clean the device. If the unit is very dirty, moisten a cloth using a little water and a small amount of household detergent. Never use cleansing agents containing solvents to clean the device.

- **Operating and Storage Temperature**

Operating temperature: $-20^{\circ}\text{C} \dots 50^{\circ}\text{C} \equiv -4^{\circ}\text{F} \dots 122^{\circ}\text{F}$; ensure proper ventilation

Storage temperature: $-20^{\circ}\text{C} \dots 60^{\circ}\text{C} \equiv -4^{\circ}\text{F} \dots 140^{\circ}\text{F}$

- **Power Supply**

The device can be disconnected from the power supply by unplugging the power cord. The power cords must be freely accessible at all times. The device should be disconnected during lightning storms or when the device is unused for a long period of time.

Important:

The switched-mode power supplies operate at very high voltages.

Coming into contact with the power supplies can lead to considerable electric shock, which may result in death.

Never disconnect the main plug by pulling the cable, always pull the plug itself.

Power-supply cords should be routed in such a way that they are not likely to be walked on, crushed, pinched, or damaged in any other way. Pay special attention to the plugs and the sockets of the device.

Important:

A damaged power cable must be replaced immediately.

The device must be grounded. Disconnecting the ground is strictly prohibited. Ensure that the device is always grounded using the power connector. Do not cover the ground connection of the power connector with any kind of insulation material!

- **Fuse**

There is no fuse in the device. The power supplies contain circuitry that protects the device from overload.

- **Lightning**

For additional protection of this device during lightning storms, or when it is left unattended and unused for a long period of time, disconnect the power cord. This will prevent damage to the device due to lightning and power line surges. Disconnection from the mains power supply is only possible by disconnecting the power plug from the mains socket.

- **Eye Safety**

This product is a Laser Class 1 product. It complies with IEC 60825-1, FDA 21 CFR 1040.10, and 1040.11.

- **External objects and/or liquids**

Never push objects of any kind into the device through openings in the casing. They may come into contact with dangerous voltage points or short out parts that could result in a fire or electric shock. Never spill liquid of any kind on the device.

- **Cables and Accessories**

Only use attachments that are specified by the manufacturer of the device.

Use high quality, properly terminated, cables to connect the device. The device should only be used with optical fibre cables that are specified for use with the devices' optical transceivers and within the specified power budget of the optical transceivers. When not in use, ensure that the optical connectors on the device and the optical fibre cables are covered with the provided caps.

Do not place this device on an unstable table, tripod, cart, etc. The device may fall, which can cause injury and serious damage to the device. Any mounting of the device should follow the manufacturer's instructions, and should use mounting accessories recommended by the manufacturer of the device.

- **Servicing**

Do not attempt to service this device yourself.

The device contains no user serviceable parts, components or controls. The operation of an opened device is not permitted. Such operation can lead to damage of the device's components due to lack of air-flow through the device.

The device may not be serviced, altered or modified without authorization from Optocore or an Optocore authorized distributor / dealer. Only qualified service personnel may carry out repair and maintenance work on the device. The warranty of the device will be voided if any unauthorized maintenance or repair work has been carried out..

CE/FCC-Conformity

This document confirms that the Festival Box bearing the CE (Communauté Européenne) label meets all requirements in the EMC directive 2004/108/EG laid down by the Member States Council for adjustment of legal requirements. Furthermore the product complies with the rules and regulations of the low-voltage directive 2006/95/EG and the Restriction of Hazardous Substances Recast Directive 2011/65/EU (RoHS 2). This product bearing the CE label complies with the following standards, ratified by CENELEC (Comité Européen de Normalisation Electrotechnique):

Electromagnetic compatibility – Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use

EN 55103-1, Emission

EN 55103-2, Immunity

EN 60065, Safety requirements

FCC notice

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communication. Operation of this equipment in a residential area is likely to cause harmful interference, in which case you will be required to correct the interference at his own expense.

Changes or modifications not expressly approved by Optocore GmbH could void the user's authority to operate this equipment.

Industry Canada Compliance Statement

This Class[A] digital device complies with Canadian ICES-003.

Avis de conformité à la réglementation d'Industrie Canada

Cet appareil numérique de la class[A] est conforme à la norme NMB-003 du Canada

The authorised declaration and compatibility certification lies with the manufacturer and can be viewed on request. Responsible as manufacturer is:

OPTOCORE GmbH, Alte Allee 28, 81245 Munich, Germany

represented by Marc Brunke, Managing Director

N.B. The awarding of the CE label confirms the compliance with legal directives issued for the manufacturer and marketing of electronic and electrical devices. As such the CE label is not a "seal of quality" but rather proof that the device bearing the CE label conforms with the electromagnetic compatibility standards laid down in the above named testing regulations.

Munich, 01.03.2019



Marc Brunke

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FESTIVAL BOX – SFP transport platform for multiple signal formats

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Device Description

Congratulations on your purchase of a FESTIVAL BOX – fiber transport platform for multiple signal formats. The FESTIVAL BOX manual will quickly demonstrate its advantages and help to ease your day-to-day workload in a professional audio-visual environment.

The FESTIVAL BOX is a point to point system, which simplifies cabling between two locations. It can be used with multiple formats available on the market that can be connected through provided SFP (Small Form-factor Pluggable) modules. The unit provides six or twelve duplex SFP slots. Each slot can be equipped with any flavour SFP interface e.g. Multimode, Singlemode, MADI, Ethernet RJ45 etc. compliant to **MSA** standard. FESTIVAL BOX multiplexes all ports into two duplex multimode fiber cables and demultiplexes them on the other end.

The FESTIVAL BOX is the perfect backbone transport system for a wide range of professional audio or data signals including proprietary fiber protocols (i.e. Optocore), Ethernet-based Cat5 or fiber protocols (such as Dante, AVB or ArtNET) or other proprietary or standard protocols. The huge selection of professional signals supported in a single FESTIVAL BOX makes it a powerful solution for any application, which requires multi-cable run.. Furthermore hot-swappable SFP-based design allows the greatest flexibility, because different medium (fiber, twisted-pair or copper) can be connected in different situations.

FESTIVAL BOX features a built-in redundant power supply with an automatic switchover. The FESTIVAL BOX Grand and Petit keeps redundancy within redundant protocols..

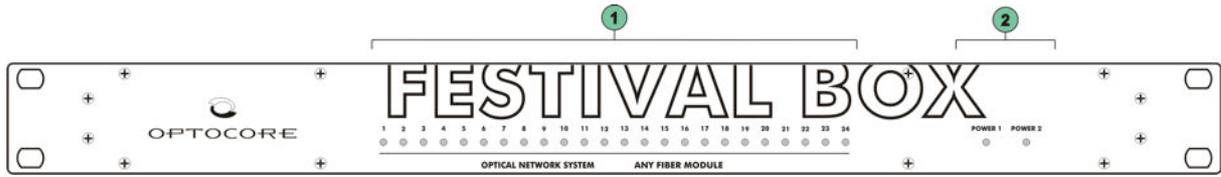
FESTIVAL BOX is a 1RU device, capable of housing up to 6 (Petit) or 12 (Grand) SFP modules that are multiplexed and/or de-multiplexed using a built-in Coarse Wave Division Multiplexing (CWDM) into two duplex multimode fibers. CWDM technology, which is used to transport multiple signal on common fiber, is a passive optical operation which guarantees no influence nor on the transported signals. Each protocol remains completely independent with its full bandwidth. The overall trunk bandwidth can be 12G (Petit) or even 24G (Grand).

The front panel provides 24 LEDs indicating signal presence on each port as well as LEDs for status of the power supplies.

FESTIVAL BOX requires no user configuration or operation – it is plug&play solution.

OPTOCORE

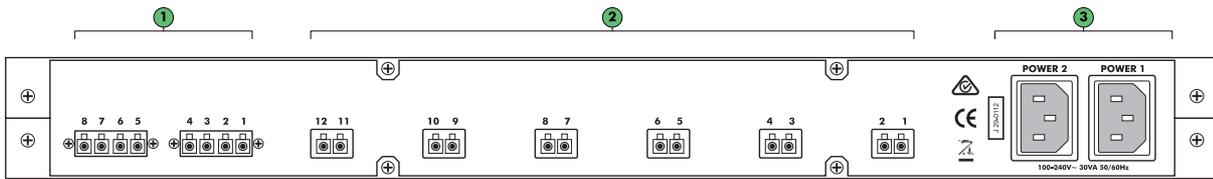
Front Panel



- 1** **Input status LED:** Signal indicator for channels 1-24:
LED ON: Signal is present
LED OFF: No signal is present
- 2** **PWR 1 LED:** Green: Power supply 1 is operational and receiving power
PWR 2 LED: Green: Power supply 2 is operational and receiving power

Rear Panel

FESTIVAL BOX – PETIT



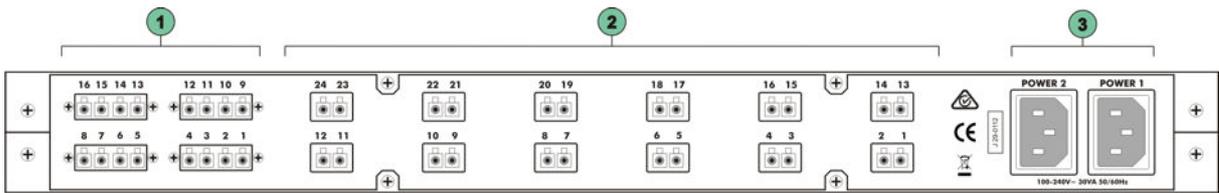
- 1** **Fiber ports 1,2:** MAIN Connection – trunk link between two Festival Boxes.

Fiber ports 3,4: Unused

Fiber ports 5,6: AUX1 1310nm port (can be used for any-bandwidth fiber signal which operates in 1310nm wavelength) Transported via MAIN1 (1,2)

Fiber ports 7,8: AUX2 1510nm port (can be used for any-bandwidth fiber signal which operates in 1510nm wavelength). Transported via MAIN1 (1,2)
- 2** **SFP ports 1-12:** Six external SFP ports are connected internally to SFP fibre transceivers that feed the specified CWDM multiplexers. Transported via MAIN (1,2)
- 3** **POWER 1 and 2:** AC input for power supply 1 and 2 (100 ... 240 V).

FESTIVAL BOX – GRAND



- 1** **Fiber ports 1,2:** MAIN1 Connection – first trunk link between two Festival Boxes.

Fiber ports 3,4: Unused

Fiber ports 5,6: AUX1 1310nm port (can be used for any-bandwidth fiber signal which operates in 1310nm wavelength). Transported via MAIN1 (1,2)

Fiber ports 7,8: AUX2 1510nm port (can be used for any-bandwidth fiber signal which operates in 1510nm wavelength). Transported via MAIN1 (1,2)

Fiber ports 9,10: MAIN2 Connection – second trunk link between two Festival Boxes.

Fiber ports 11,12: Unused

Fiber ports 13,14: AUX3 1310nm port (can be used for any-bandwidth fiber signal which operates in 1310nm wavelength) . Transported via MAIN2 (9,10)

Fiber ports 15,16: AUX4 1510nm port (can be used for any-bandwidth fiber signal which operates in 1510nm wavelength). Transported via MAIN2 (9,10)
- 2** **SFP ports 1-12:** Six external SFP ports are connected internally to SFP fibre transceivers that feed the specified CWDM multiplexers. Transported via MAIN1 (1,2)

SFP ports 13-24: Six external SFP ports are connected internally to SFP fibre transceivers that feed the specified CWDM multiplexers. Transported via MAIN2 (9,10)
- 3** **POWER 1 and 2:** AC input for power supply 1 and 2 (100 ... 240 V).

Device Details

SFP Ports

FESTIVAL BOX is equipped with six (Petit) or twelve (Grand) SFP ports that can be populated with different SFP modules that run up to 2Gbit of data.

Data from external SFP port is converted to the internal CWDM SFP fiber transceivers..

The internal SFP transceivers connect to the internal CWDM passive multiplexing module, which allows multiple protocols to be combined into a single fiber.

All internal SFP fibre transceivers are populated at the time of manufacturing. Internal SFP should not be accessed or changed by user.

Aux Ports

External AUX ports connect directly to the multiplexer module. Those ports can be used to an external device such as an Ethernet switch populated with 1310nm or 1510nm fiber transceivers.

Main Ports

FESTIVAL BOX is populated with passive CWDM multiplexing module(s) which combines all ports to the MAIN connection. MAIN ports are dedicated to be used with multimode cabling.

Power Supply

The device is equipped with two power supplies and inputs. If the primary power supply were to fail, due to disruption of the power source or in the case of a power supply malfunction, the device will automatically switch over to the redundant power supply. In order to make the power supply to the device redundant, both power inputs must be connected to the mains supply, if possible to different phases, circuits, or by having one of the power supplies connected to an uninterrupted power supply (UPS).

The power supplies operate with mains voltage of 100 ... 240 V and frequency of 50 ... 60 Hz. The device can be used throughout the world without any modifications or transformers.

Please note:

The switched-mode power supplies operate at very high voltages.

Coming into contact with the power supplies can lead to considerable electric shock, which may result in death.

To prevent electric shock, do not remove any covers of the device.

Control

The FESTIVAL BOX is a plug-and-play device that does not require any user control or configuration.

Connectors and Cables

SFP transceivers

Each external SFP slot can be populated with different SFP transceivers. External SFPs are hot-swappable – there is no need to power down the device when changing SFP, change of single SFP does not influence other ports.

Please note:

It is recommended to use SFP transceivers supplied and certified by Optocore.
3rd party transceiver use might cause device malfunction.

Any SFP that might be used should be **MSA** compliant.

Main and Aux Fiber

Main and Aux fiber ports require LC multimode cables. Custom singlemode FESTIVAL BOX is available on request.

Power Connection

For AC connection use power cords with IEC C13 connectors.

SFP Options available from Optocore

Optocore offers multiple SFP transceiver options, which allow different protocol and medium connectivity in the FESTIVAL BOX.

Festival Box MADI TRX

Unique design allows connectivity with multimode as well as singlemode AES10/MADI devices. Both multimode and singlemode can be utilized.

Multimode AES10/MADI transceivers connected using a 62.5 μm OM1 fibre cable (or better) can be used for applications requiring cable lengths of up to 2000 m (worst case).

Single mode AES10/MADI transceivers connected using a 9 μm fibre cable can be used for applications requiring cable lengths of up to 70 km (worst case).

Festival Box 1000T-RJ45

RJ45 module accepts most of the twisted-pair cable-based protocols. It supports any protocol, which utilizes ISO Layer2 standard IEEE 10/100/1000Mb Ethernet protocol. It supports also proprietary Cat5/6/7 protocols. The list of supported and tested proprietary protocols can be found on www.optocore.com website.

For a proper transmission it is required to keep the same connection speed at each end – RJ45 transceiver does not offer auto-negotiation, because this could make some proprietary protocols incompatible. E.g. If connection on one host (i.e. controlled equipment) is 100Mbps the host on the other end (i.e. control computer) should be manually set to 100Mb.

Festival Box Multi mode TRX 2Gbps

850nm transceiver can be used in audio and data applications up to 2Gb bandwidth (i.e. Digico, Optocore, Ethernet). Requires 50 μm OM2 or better fiber cable and can be used for applications requiring cable lengths of up to 700 m (worst case).

Festival Box Single mode TRX 1Gbps

1310nm transceiver can be used in audio and data applications up to 1Gb bandwidth (i.e. Optocore 1G, Ethernet). Requires 9 μm OS1 or better fiber cable and can be used for applications requiring cable lengths of up to 20km (worst case).

Festival Box Single mode TRX 2Gbps

1310nm transceiver can be used in audio and data applications up to 2Gb bandwidth (i.e. Digico, Optocore 2G, Ethernet). Requires 9 μm OS1 or better fiber cable and can be used for applications requiring cable lengths of up to 20km (worst case).

Hardware Connection

Example 1

Two FESTIVAL BOX Grand units are connected to each other using two duplex multimode cables. Each Festival Box is equipped with set of different transceivers providing fiber as well as RJ45 connectivity. Two main connections can be used to extend cable redundancy of redundant systems such as Digico, AVID AVB ring, DANTE, Optocore etc. If one main cable fails all redundant systems will switch to their backup ports.

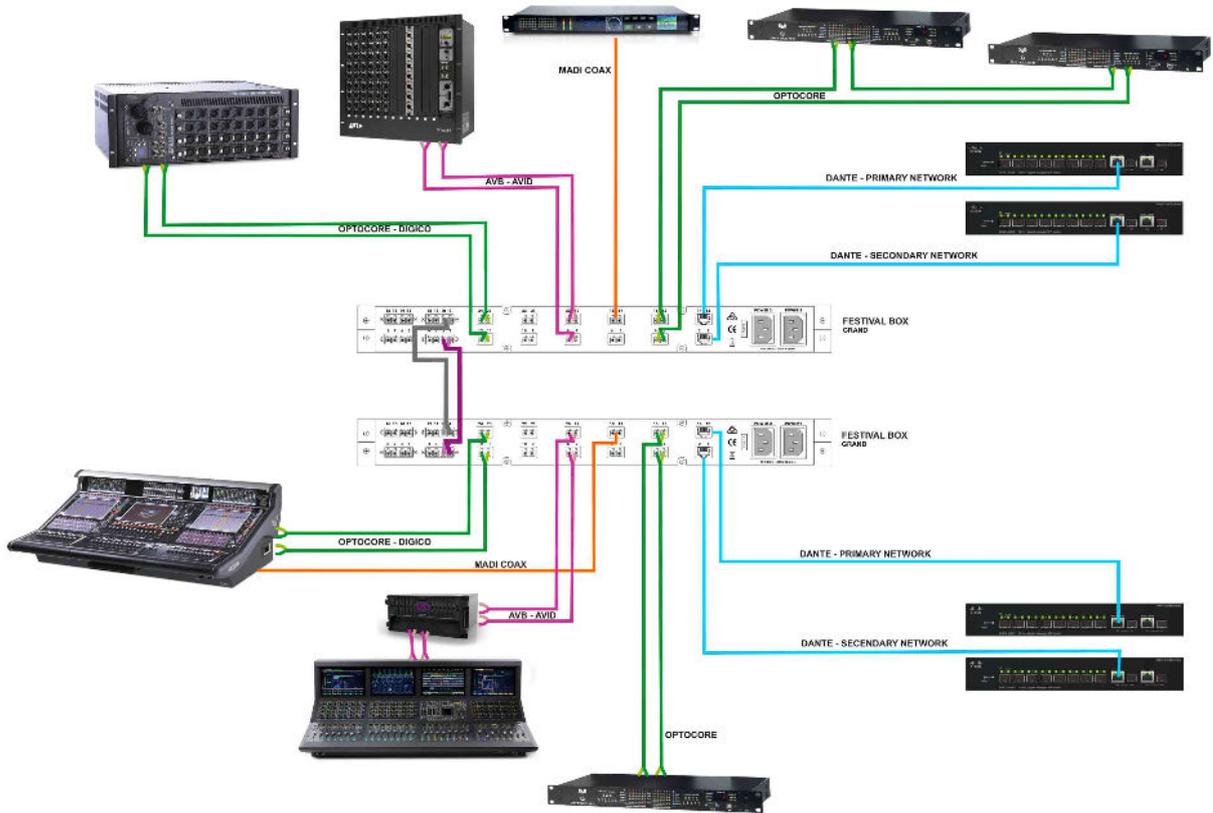


Fig. 1: Connection of two FESTIVAL BOX Grand

In this example each FESTIVAL BOX Grand has two main multimode connections - each main fiber carries signals from six SFP slots. 1-12 is transported over Connection 1,2; slots 13-24 through connection 9,10.

Example 2

Two FESTIVAL BOX Petit units are connected to each other using two duplex multimode cables. Each Festival Box is equipped with set of different transceivers providing fiber as well as RJ45 connectivity. Two main connections can be used to extend cable redundancy of redundant systems such as Digico, AVID AVB ring, DANTE, Optocore etc. If one main cable fails all redundant systems will switch to their backup ports.

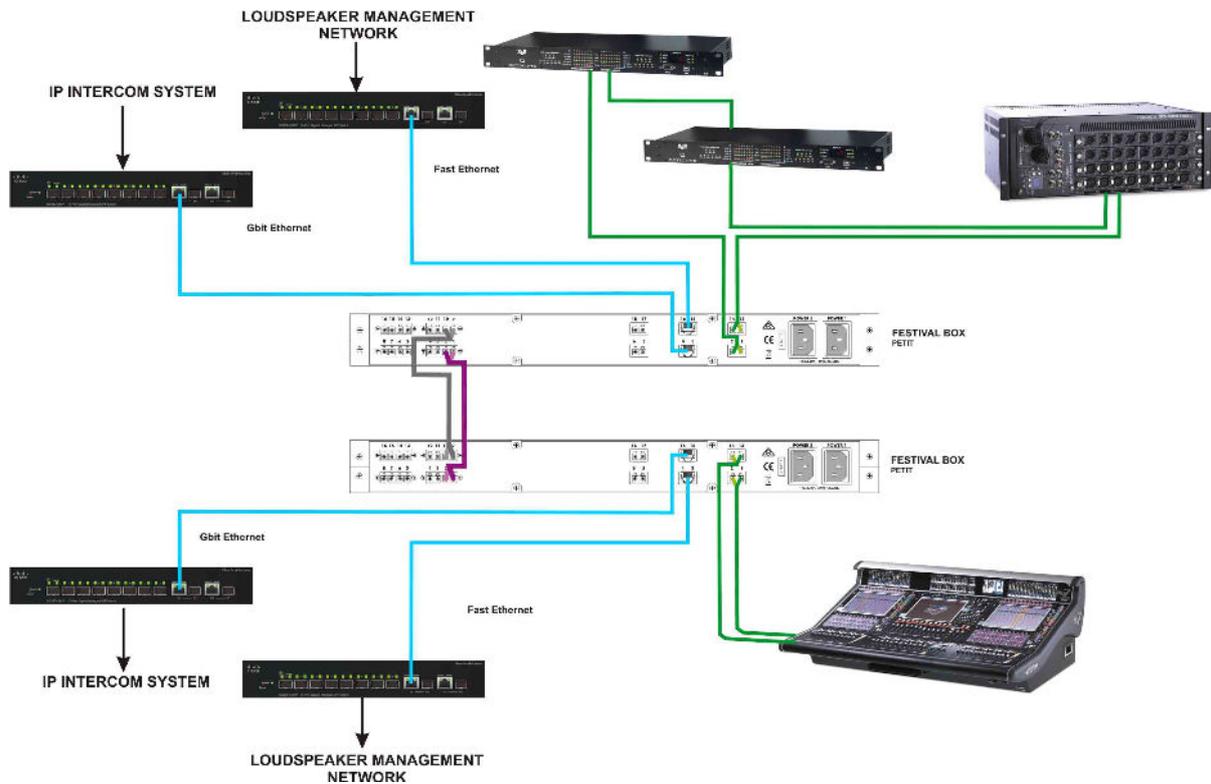
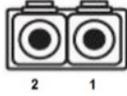


Fig. 2: Connection of two FESTIVAL BOX Petit

In this example each FESTIVAL BOX Petit has two main multimode connections - each main fiber carries signals from three SFP slots. 1-6 is transported over MAIN Connection 1,2; slots 13-18 through MAIN connection 9.10.

Connection Table

Pin-out	Optical Fibre-Port MAIN and AUX		
		PORT	
		RXD	TXD
	Pin	1	2
<p>LC connectors</p> 			

Technical Specifications

SFP Ports	MSA compliant
Data rate	Up to 2 Gbps
MAIN Optical Connection	Complies with 21 CFR 1040.10 and 1040.11
AUX Optical Connection	1310nm single/multimode fiber tunnel (5,6 ; 13,14) 1510 nm single/multimode fiber tunnel (7,8 ; 15,16)
Power supply	2 independent power supplies with function check and automatic switch-over
Type	Switch-mode, universal input
Mains voltage	100...240VAC, 50/60Hz, 10VA-typ

Dimensions and Weight

Front panel: width 483 mm / 19 inch
 height 44 mm / 1.73 inch
 depth 200 mm / 7.87 inch

Rear panel: width 438 mm / 17.25 inch

Weight

2.83 kg ≅ 4.41 lbs

Please note:

Modifications that serve the purpose of technical improvement may be carried out without prior notification.

Warranty and Liability

Summary of Warranty

OPTOCORE FESTIVAL BOX device is warranted against defects in material and workmanship for 60 months (5 years) from the date of purchase. This warranty does not include mechanical damages caused by misuse. This warranty covers the original registered purchaser only and is not transferable. This warranty does not apply to devices which have been purchased in used condition or demonstrator equipment.

OPTOCORE will, at its discretion, repair or replace a defective product, providing that the defect has occurred under normal operating conditions.

This warranty does not cover damage from acts of God, accident, abuse, neglect, contamination, unauthorised modification, misuse, or operation outside of the environmental specifications for the product, improper site preparation or maintenance, or abnormal conditions of handling. This would include over-voltage failures, and conditions outside of the products specified ratings, problems with customer-supplied software or interfacing, or normal wear and tear of mechanical components. OPTOCORE will acknowledge the evaluation of warranty after inspection.

Not covered by this warranty are defects arising from electromagnetic or electrical interferences, deficiency, excess, or surge of electrical supply, air conditioning, or humidity. This also includes repairs made necessary by dirt, abrasion, moisture, rust, corrosion, or similar conditions.

Devices on which the Serial Number has been removed or defaced are not eligible for warranty service.

OPTOCORE devices contain no user-serviceable components: refer to qualified service personnel for repair or upgrade. The warranty will be void if you tamper with internal components. Please address any questions or inquiries to OPTOCORE or your distributor/dealer.

For a full warranty conditions refer to the Warranty Card attached to every Optocore device with a first shipment.

How to Obtain Warranty Service

When discovering a problem with an OPTOCORE device, you should contact either Optocore directly or a dealer/distributor to determine and confirm a hardware fault. If it is a software issue the hardware must not be returned to OPTOCORE, OPTOCORE will issue a support ticket in this case.

If hardware service is required within the warranty period, take the equipment, along with warranty card, to the nearest authorised OPTOCORE dealer/distributor. The dealer/distributor will make sure that the device is serviced according to the terms of warranty by OPTOCORE or an authorised service centre.

If the equipment needs to be returned directly to OPTOCORE, first contact support@optocore.com.

OPTOCORE requires the serial number of the equipment intended for return, as well as a short description of the problem. If possible, you should also provide us a phone number where you can be reached during regular working hours. To return a defective product, please contact your distributor / dealer. Our web site: <http://www.optocore.com/> provides a complete list of Optocore distributors / dealers.

Make sure the equipment being returned is packed carefully to protect it from damage during shipment. OPTOCORE requires that shipments are pre-paid and insured – unless specifically authorized in advance.

We strongly advise not to use simple flight-cases without rack-in-rack mounting.

Declaration of Liability

Optocore accepts no liability for damage caused to other devices through operation of the FESTIVAL BOX device.

Optocore is not liable for any damage caused by shipping accidents, misuse, abuse, operation with incorrect AC voltage, operation with faulty peripheral equipment, or improper or careless installation of the device.

Neither OPTOCORE nor anyone involved in the production of the equipment shall be liable for any indirect, special, disciplinary, consequential, or incidental damages arising out of the use or inability to use this equipment even if OPTOCORE has been advised of the possibility of such damages. In no event shall the liability of OPTOCORE exceed the purchase price of any defective equipment.

Optocore accepts no claims for compensation whatsoever (e.g. cancellation of events).

Shipping Contents

The standard shipment of a FESTIVAL BOX unit contains the following:

- 1 FESTIVAL BOX unit
- 2 power cables

FESTIVAL BOX might be packed as a pair in to one box so the number of above is doubled.

Any additionally purchased equipment such as optical wave-guide cables in required lengths, D-Sub cables and adapters, RS232 cables, and international electric cables, which have been supplied on your request and your purchase order, cannot be listed above.

Please note that due to the Ecology reason standard shipment **does not** contain printed copy of User Manual. All latest OPTOCORE user manuals can be downloaded from the website:

<http://www.optocore.com/index.php/support/downloads>

Printed version of User Manual is available on a special demand. Please contact support@optocore.com if printed version is required.

Company Information

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