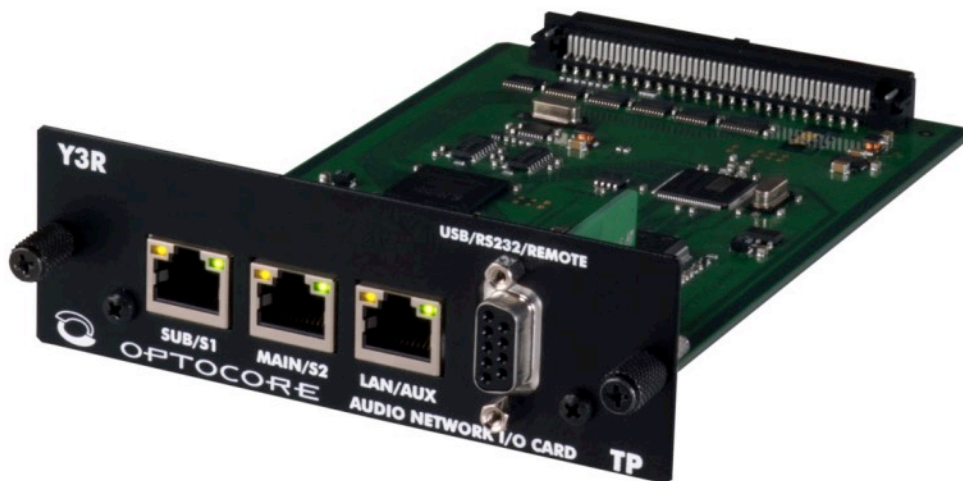




# OPTOCORE



## Operating Manual for Y3R-TP Device

Yamaha miniYGDAI card with SANE and Ethernet

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OPTOCORE GmbH  
Alte Allee 28  
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Germany

**Y3R-TP- miniYGDAI card for Yamaha with SANE and Ethernet**

Operating Manual  
Rev. 2.3

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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 the card near water, for example, in humid or damp rooms.
- Clean only with a dry cloth.
- Install the card in accordance to the operating manual.
- Do not place the card near any heat source such as radiators, power-amplifiers, or any other heat producing equipment.
- Never switch on power amplifiers before the complete system is stable and the level meters of the OPTOCORE CONTROL software indicate a normal level.
- The card 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 card.
- Only use attachments specified by the manufacturer.
- The card contains no user serviceable parts: only refer to authorized, 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.

- **Handling**

To prevent damage through electrostatic discharge (ESD) do not touch the electrical components directly. While inserting the card into the slot of a console, hold the card at its front panel or by the use of rack mount screws.

- **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..

- **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**

Never use liquids or 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 console in which the card is mounted provides power supply and grounding.

- **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 console mains power. 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.

- **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.

- **Servicing**

Do not attempt to service this device yourself.

The device contains no user serviceable parts, components or controls.

The device may not be serviced, altered or modified without authorisation from Optocore or an Optocore authorised 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 product Y3R-TP 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, 11.12.2013



Marc Brunke

## Y3R-TP - Yamaha miniYGDAI card with SANE and Ethernet

### *Table of Contents*

Important Safety Instructions.....	3
Purchaser Information .....	4
CE/FCC-Conformity .....	6
Device Description .....	8
Front Panel.....	9
Device Details .....	10
Digital Audio.....	10
SANE ports .....	10
HA Remote .....	10
USB/RS232/REMOTE Auxiliary Port.....	10
LAN Port .....	10
RS232-Connection.....	10
USB-Connection .....	10
Transmission Delay .....	10
Connectors and Cables.....	11
SANE Ports.....	11
RS232-Connection.....	11
Connector Hood Quality.....	11
USB-Connection .....	11
LAN-Connection.....	11
Control.....	11
Hardware Connection.....	12
Example .....	12
Device Compatibility.....	13
Connection Tables .....	14
D-SUB9 Connector .....	14
TRI-Y Adapter .....	14
Technical Specifications.....	15
Dimensions and Weight .....	16
Warranty and Liability.....	17
Shipping Contents .....	18
Company Information .....	18

## Device Description

Congratulations on your purchase of an Y3R-TP Digital Mini - YGDAI Card with SANE and Ethernet. The Y3R-TP card will quickly convince you with their advantages and will facilitate your day-to-day work with Yamaha consoles and devices such as the CL, QL, PM or DM series devices. Y3R-TP card offer a broad flexibility in all sorts of temporary and permanent applications, especially when long distance connections, high-quality audio transmission, extremely low latency or high security is required.

Each Y3R-TP card allows a connection of Yamaha consoles with the OPTOCORE ® OPTICAL DIGITAL NETWORK SYSTEM by Cat5 based SANE protocol. The SANE protocol is capable to insert up to 64 audio channels IN and extract 64 audio channels OUT of the Optocore network simultaneously (32 IN / 32 OUT at 96k). Inserted into the device slot, one Y3R-TP exchanges a maximum of 16IN / 16OUT audio channels according to the Yamaha Mini - YGDAI standard.

Y3R-TP card can be switched between 8/16-channel mode on the Mini - YGDAI slot via software. Up to four (when working in 16-channel mode) or eight (when working in 8-channel mode) cards may be connected in one SANE daisy chain. SANE daisy chain can be seamlessly integrated to the 2Gbit OPTOCORE network by SANE ports of any R-Series FX device.

Please refer to Chapter “Device Compatibility” for more information regarding the compatibility of your console or device.

The Y3R-TP front panel offers several outstanding features:

- One RJ45 SUB/SANE1 port for connection of the MAIN/SANE1 port of additional Y3R-TP cards via CAT5 cable.
- One RJ45 MAIN/SANE2 port for connection of the SUB/SANE1 port of additional Y3R-TP cards or R-series TP devices via CAT5 cable
- One RJ45 LAN port for connection of any standard 10/100MBit Ethernet device, transport of control or any Ethernet compatible data via the Optocore network.
- USB/RS232/Remote (D-Sub-9) port for remote control, software update, connection of external PC, and 2 x RS422 e.g. for transport of Yamaha Remote Protocol to AD8HR by a link to the HA Remote interface of the console.
- Direct pick up of HA Remote signals from the console slot e.g. provided in Yamaha CL, QL or LS9 series.

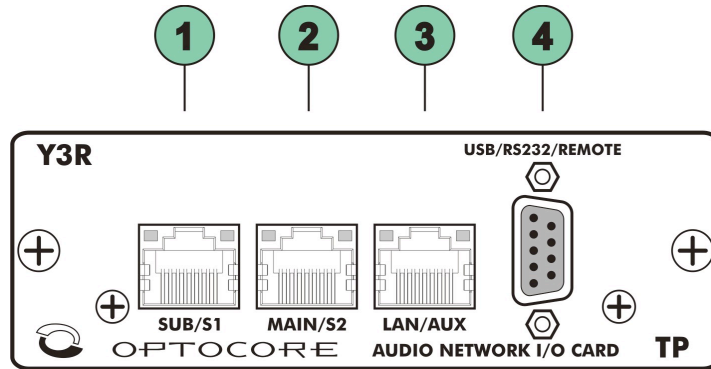
The Y3R-TP card with R-Series FX interface (analogue, MADI or AES/EBU) and any other Optocore device on stage e.g. X6R-FX-16MI linked by a fiber optical cable can easily replace an analog multi-conductor cable, weighting only a fraction of a conventional copper cored one. In ‘Yamaha Mode’ the Y3R-TP cards allow the gain control of Optocore microphone preamps on stage, as provided in X6R-Series using a Yamaha digital console.

Due to SMD production the Y3R-TP cards fulfils the demand of highest digital standards. The FPGA (field programmable gate array) based concept of the internal logic circuitry, permits updating of the hardware via the units remote ports, ensuring continual state-of-the-art cards.

Direct USB connection from Y3R-TP card is not necessary for OPTOCORE CONTROL software to control the entire Optocore network – all control for Y3R-TP can be done through any device in the fiber Optocore loop. OPTOCORE CONTROL software is used to change the configuration or define own settings. It provides easy access to all configuration and control tools, including routing, naming, gain setting, and phantom power activation for attached devices such as X6R storage and recall of configurations on the computer, off- and online mode, real-time level display of the individual channels in online mode.



## Front Panel



- 1 **SUB/S1:** RJ45 SANE 1 port for connection to the next Y3R-TP card “MAIN/S2” port with CAT5 cable
- 2 **MAIN/S2:** RJ45 SANE 2 port for connection to the R-Series FX device “SANE 1” port or the previous Y3R-TP “SUB/S1” port with CAT5 cable
- 3 **LAN/AUX:** RJ45 port for connection of any standard 10M/100M Ethernet device
- 4 **USB/RS232/REMOTE:** D-Sub-9 plug containing following interfaces:  
RS232 port for remote control and update via PC  
USB port for remote control via PC  
2 x RS422 ports e.g. for Yamaha HA Remote protocol exchange with console

Use the TRI-Y cable, provided with the Y3R-TP card. See chapter “Connection Tables” for detailed pin out. For updating via PC a standard RS232 cable is sufficient.

## Device Details

### Digital Audio

The Y3R-TP digital audio interface is located on the console slot connector. According to the Yamaha Mini - YGDAI standard, the Y3R-TP card features a maximum of 16IN / 16OUT audio channels. Using the OPTOCORE CONTROL software the card can be switch to 8 channel mode for Yamaha devices providing 8IN / 8OUT audio channels, such as the DIO8.

### SANE ports

All TP units are equipped with two RJ45 200MBit SANE Ports for 64 bi-directional channels of synchronous audio + 100MBit Ethernet

**Please note:**

Always connect in the correct order in the daisy chain – from SANE 1 to SANE 2. Do not close the SANE loop.

### HA Remote

The Y3R-TP card supports direct pick up of HA Remote signals from the console slot (HA remote signal is available only on Slot1 in a console) e.g. provided in Yamaha CL, QL or LS9 series. If the console does not provide the HA Remote signal on the console slot, the signal can be applied externally to the USB/RS232/REMOTE port.

### USB/RS232/REMOTE Auxiliary Port

Two RS422 digital channels with a data transfer rate of up to 1Mbps are provided via D-SUB-9 connector on the front panel. The two channels are software patchable to any Optocore device featuring RS485/RS422 auxiliary ports. The Yamaha HA Remote protocol can be applied from the consoles external HA Remote port and transported to any device in the Optocore network by using the provided TRI-Y cable, enabling the connection and remote control of Optocore or Yamaha converters directly from the console.

### LAN Port

A 10/100 Mbps Fast Ethernet interface is provided via RJ45 port. All LAN ports of the Optocore devices within the Optocore network form a virtual switch with physically distributed ports. We recommend using a standard CAT5 network cables to connect any Ethernet device such as a standard Ethernet switch for local distribution.

### RS232-Connection

A RS232 port is provided within the D-SUB-9 connector on the front panel. It can be used to upgrade the cards internal logic or to connect it with the OPTOCORE CONTROL software.

### USB-Connection

The D-SUB9 connector also provides an USB port. It allows you to connect with the OPTOCORE CONTROL software as well as for firmware upgrade.

### Transmission Delay

The Optocore system delay including the matrix is fixed to 41,6  $\mu$ s @ 48 kHz for all channels. The additional transport delay per Optocore unit (<200 ns) in the network is insignificant in comparison. Overall system delay is dependent on the converters used and the length of network cables in the system. Assuming 'normal' cable lengths of <700 m per link, the additional delay is considered marginal.

The transmission delay is constant between any points in the network.

## **Connectors and Cables**

### **SANE Ports**

Use standard, fully wired, twisted pair cable (Cat 5, Cat 5e, Cat 6) terminated with RJ-45 connectors. SANE utilizes all four pairs of the Cat 5 cable, two pairs for standard Ethernet transmission and two pairs for the SANE synchronous audio transport. A SANE cable shall not exceed a total cable distance of 100 m

### **RS232-Connection**

Use a standard shielded RS232 cable.

### **Connector Hood Quality**

Locking screws for D-Sub connectors should be compatible with 4-40 UNC. Care should be taken in selecting the right type of connector hoods in order to fulfil the requirements of EMI-radiation directives. Full metal connector hoods should be used, approved acc. to VDE 0871, FCC 20780 and EMC directive 2004/108/EG, providing attenuation > 40 dB between 30 MHz up to 1 GHz. The shield of the cable should have contact to the connector hood.

### **USB-Connection**

The D-SUB9 connector also provides an USB port. Use the TRI-Y cable, which is provided with every Y3R-TP card.

### **LAN-Connection**

Use a standard twisted pair cable (Cat-5, Cat-6) with RJ-45 connectors.

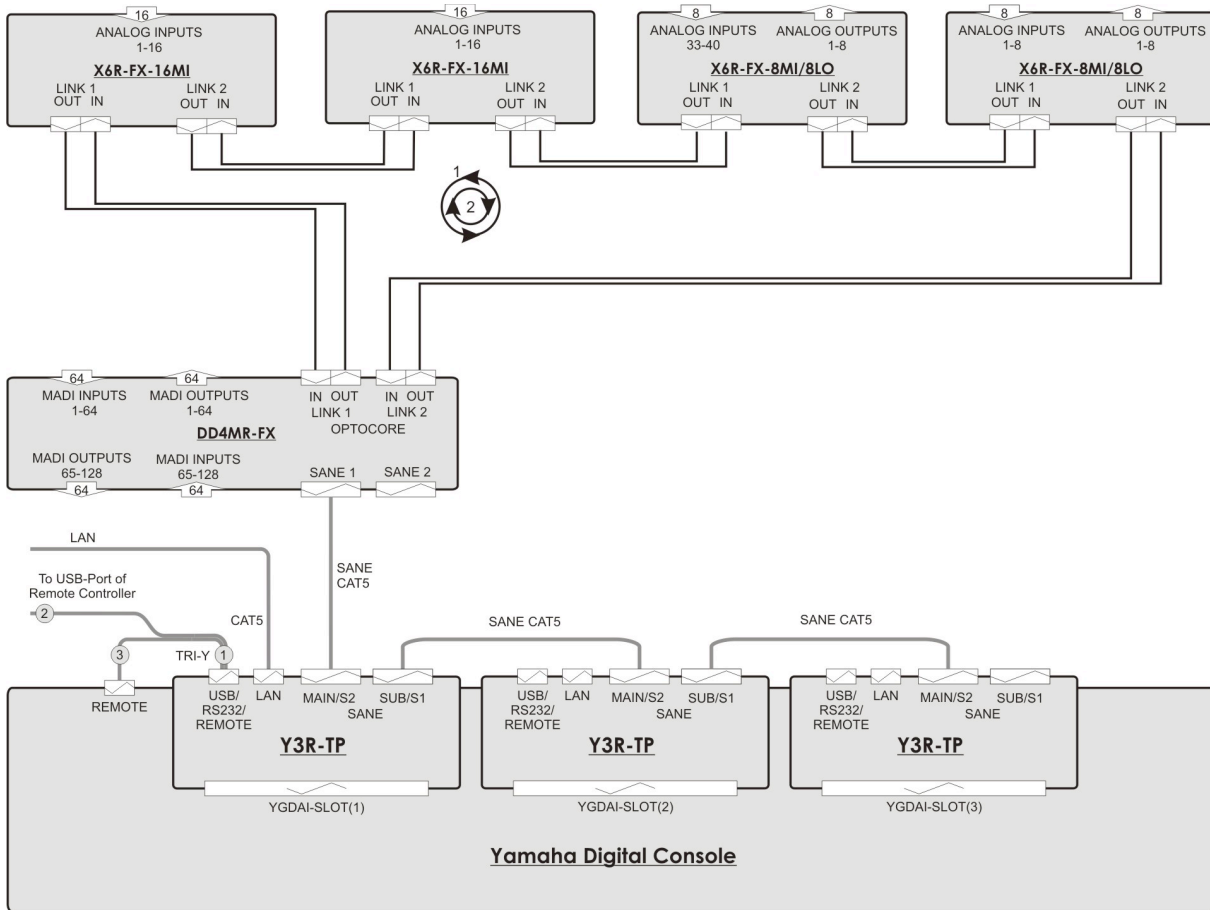
## **Control**

The Control of all devices in the Optocore network including Optocore converter modules is achieved from any FX unit using the OPTOCORE CONTROL software via RS232 or USB port. Y3R-TP Local Settings can be set by USB or RS232 port, which are both available using D-SUB-9 connector on the front panel. Y3R-TP card can be also directly accessed via LAN port or SANE port and Ethernet connection. The Yamaha HA Remote protocol for Optocore preamp control via Y3R-TP card can be activated via OPTOCORE CONTROL menu Set / Special Mode.

## Hardware Connection

### Example

Multiple Y3R-TP cards can be inserted into Yamaha console. The console can work as a Cat5-based extension to the 2Gbit fiber OPTOCORE ring. The advantage of this solution is that whenever console is switched off, the whole system continue unaltered performance as fiber redundant ring. .



**Fig. 1: OPTOCORE fiber network with Y3R-TP cards connected by SANE**

This example shows the fiber-based ring with Yamaha console connected by SANE to the DD4MR-FX. There are four analog X6R-FX converters creating a 48/16 stagebox connected to MADI DD4MR-FX unit, which provides an audio channels feed to the external recording system. DD4MR-FX works in this case as OPTOCORE to SANE bridge and enables the seamless integration of Y3R-TP SANE daisy chain. Y3R-TPs are connected by Cat5 cables to the DD4MR-FX unit, providing not only audio signals between OPTOCORE system and the console, but also control data for the OPTOCORE X6R microphone preamps.

Each single channel from the whole network can be routed to the Y3R-TP cards.

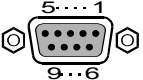
## Device Compatibility

The table below lists Yamaha consoles and devices by the number of IN / OUT audio channels supported on one console slot. Set the Y3R-TP cards either to “MY-16AT emulation” or “MY-8AT emulation” according to the number of channels supported.

<b>16 IN / 16 OUT</b> <b>MY-16AT</b> <b>Up to 4 x Y3R-TP = 64 IN / 64 OUT</b>	<b>8 IN / 8 OUT</b> <b>MY-8AT</b> <b>8 x Y3R-TP = 64 IN / 64 OUT</b>
PM5D / PM5D-RH M7CL Series LS9 Series (with HA remote transport via slot) DM2000 DM1000 02R96 01V96 DME64N / DME24N CL Series QL Series Rivage PM10 All future products with Mini - YGDAI slots	DIO8 for PM1D / PM1DV2 DME32 AD824 DA824

## Connection Tables

### D-SUB9 Connector

Pin-out	YG2 RS232/USB/RS422									
	Channel	RS232		USB		RS422		GND	Use 1-modem cable, male – female, to connect to PC. Consider non-standard pinning!	
		RXD	TXD	+	-	Port1	Port2			
	Pin	3	2	1	6	4, 9	7, 8	5		
<b>D-Sub-9- female</b>								Locking system acc. to 4-40 UNC		

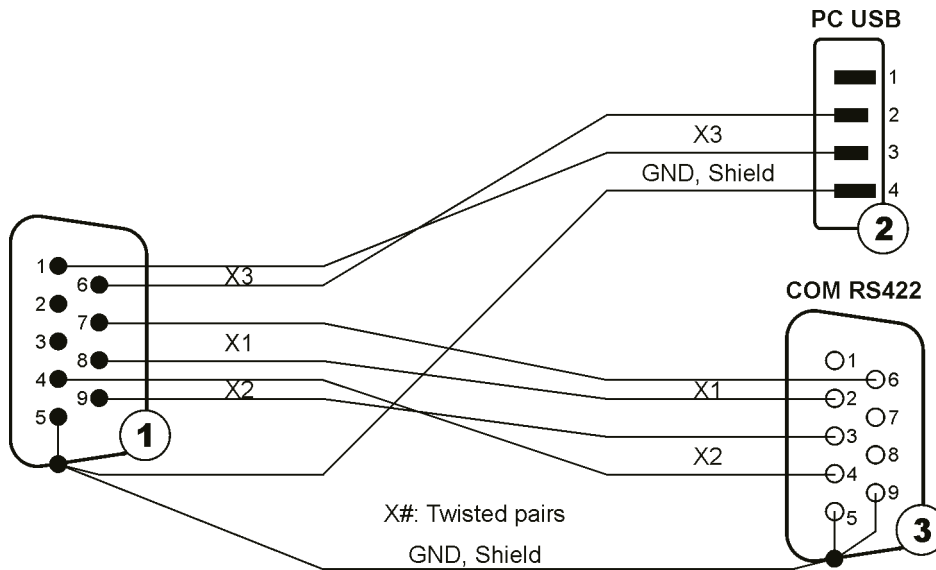
### TRI-Y Adapter

The TRI-Y cable combines the two RS422 and the USB-Port for PC connection in one D-Sub-9 connector. It is used to establish the connection from the YG2-Card to a PC USB interface and remote interface of a console.

**Y3R-TP** Auxiliary Port 2 x RS422 and USB port  
 D-Sub-9-male  
 Fastening system 4-40 UNC  
 X1...X2: RS422  
 X2...X3: USB

**PC USB**  
 Type A  
 X3: T/R x D

**COM RS422**  
 D-Sub-9-female  
 Fastening system 4-40 UNC  
 X1: R x D  
 X2: T x D



## Technical Specifications

<b>Digital Audio</b> (Mini - YGDAI Slot)	Convention Mini - YGDAI Interface	
<b>HA-Remote</b> (Mini - YGDAI Slot)	Convention Mini - YGDAI Interface	
<b>Data channels</b>	Digital control data	TX / RX up to 1Mbps
<b>Word Clock</b> (Mini - YGDAI Slot)		
<b>Data rate</b>	Dependant on used sample rate	44.1 / 48 / 88.2 / 96kHz +/-100ppm
<b>SANE, LAN</b>	Convention	
<b>Audio</b>	TIA - 568A/B, Optocore	200 Mbit/s
<b>LAN</b>	TIA - 568A/B, IEEE - 802.3	10/100 Mbit/s
<b>Auxiliary Ports</b>	Convention EIA / TIA - 422	
<b>Data channels</b>	Digital control data	1 IN / 1 OUT up to 1Mbps
<b>RS232 Port</b>	Convention EIA / TIA - 232	
<b>Data channels</b>	Digital control data	R x D, T x D
<b>Data rate</b>	57 600 Baud	
<b>USB Port</b>	Remote control connection	USB 1.1 full speed

## ***Dimensions and Weight***

### ***Cards Dimensions***

H x B x T: 100 x 160 x 40 [mm]  
H x W x D: 3.94 x 6.3 x 1.57 [inch]

### ***Cards Weight***

Weight: 365 g / 12.88 ounces

### ***Package Dimensions***

H x B x T: 170 x 225 x 85 [mm]  
H x W x D: 6.69 x 8.86 x 3.35 [inch]

### ***Package Weight***

Weight: 540 g / 19.4 ounces

**Please note:**

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



## **Warranty and Liability**

### **Summary of Warranty**

OPTOCORE Y3R-TP 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](mailto: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 Y3R-TP 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 Y3R-TP card contains the following:

- 1 Y3R-TP card
- 1 operators manual
- 1 CAT5 patch cable
- 1 TRI-Y cable

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.

## **Company Information**

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