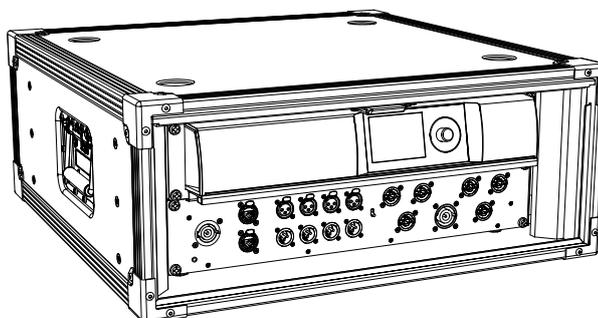


SYSRACK-TGX

Operation manual



Introduction

Thank you for choosing a high-quality product “MADE IN GERMANY” from the brand TWAUDIÖ.

The SYSRACK-TGX, developed by TWAUDIÖ, includes a Dynacord TGX10 power amplifier as well as the new LED illuminated APL7 TGX connection panel, all combined in the new Rack4TGX.

TGX 4-channel live sound amplifiers from Dynacord are one of the most powerful on the market and represent the pinnacle of pro audio electronics engineering. Along with unprecedented power density, they offer Dynacord’s signature audio quality, advanced reliability and power efficiency.

The APL7 connector panel provides all of the amplifier’s connections at the front of the SYSRACK-TGX. The integrated and switchable LED strip ensures a clear overview of the panel even in difficult lighting conditions.

The panel layout follows the logical signal flow through the amplifier with a power, network, audio input and output section. The two network ports provide the ability to use the amplifier in a fully redundant network configuration supporting the latest standards in audio-over-IP protocols with the OMNEO IP interface for Dante® and AES70.

The panel features the TGX series’ ability to buffer digital audio signals when multiple amplifiers are connected in parallel. The AES/EBU input signal is latency-free processed via an active circuit in the amplifier.

If you lend your product to another party, inform that party of the safety-related operating procedures and hand over this assembly guide. If you require additional copies of this manual, you can obtain them free of charge from TWAUDIÖ or download them from www.twaudio.de

Instructions in this user manual

Strictly adhere to the instructions contained in this operating manual that are marked as follows:



This symbol in combination with the signal word “Warning” identifies a potentially hazardous situation. Failure to comply with this safety instruction can lead to serious injury or even death.



This symbol in combination with the signal word “Warning” identifies a potentially hazardous situation for persons with a pacemaker. Failure to comply with this safety instruction can lead to serious injury or even death.



This symbol in combination with the signal word “Caution” identifies a potentially hazardous situation. Failure to comply with this safety instruction can lead to light or moderate injury.



This symbol in combination with the signal word “Note” identifies a potentially hazardous situation. Failure to comply with this safety instruction can lead to product damage.



This symbol in combination with the signal word “Tip” identifies additional information or notes that will simplify working with TWAUDIO products on the basis of practical experience.

Notes on the products

**Read manual
before use!**

Before using the device, carefully read the operating manual and keep it with the SYSRACK-TGX.

General information

Operation manual: OM-SYSRACK-TGX
Version 2.0 en, 10/2023
© by TWAMBO 2023; all rights reserved.

All information contained in this operating manual was correct to the best of our knowledge at the time of printing.

Quality warranties or assurance of suitability for a certain type of use based on the technical specifications, dimensions and weights are not granted by TWAMBO.

TWAMBO also shall not assume liability for any secondary damage (property damage and/or personal injury) nor for the failure to comply with this operating manual!

TWAMBO reserves the right to update this document based on recent developments.

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1. Safety | Intended use

Please adhere to the following safety instructions to avoid risks when using amplifiers.

The SYSRACK-TGX is developed for use in professional sound systems. The SYSRACK-TGX may only be used by trained and qualified personnel.

Note the operating modes described in this assembly instructions. Other uses are not permissible.

The rack is fully pre-wired and contains a Dynacord TGX system amplifier and a dedicated connection panel for network and audio as well as power supply.

Damage caused by improper use is not covered by TWAMBO.



Before using the SYSRACK-TGX, verify the shipment for completeness and ensure that all parts are in a proper condition.



This operating manual describes the intended use of the SYSRACK-TGX. Any other use is not as intended and may result in damage or even injury.

Modifications on the SYSRACK-TGX are not permitted! There is danger to life! Also observe the manufacturer's instructions and safety notes when operating the products, especially the power amplifier used.



The SYSRACK-TGX is designed both for indoor and outdoor use. Keep the device away from water!



The SYSRACK-TGX may only be used by trained and qualified personnel. Before each use, the SYSRACK-TGX must be checked for its full functionality and the proper condition of all items.



The SYSRACK-TGX has to be taken out of operation immediately, as soon as visible damage to the rack, the devices or its cabling are visible.



When moving (assembling, dismantling, maintaining) the SYSRACK-TGX, ensure sufficient space to prevent collisions with other objects.



Please note that there is a risk of electric shock or fire if the mains cable or power connector is damaged!



The SYSRACK-TGX must only be operated via a mains power supply with a safety ground connector. Do not disconnect or cover the safety ground connection of the power cable.

Replace the mains cable immediately if the cable or connector is damaged!

Ensure that the power connector is only plugged and unplugged if the device is free of voltage.



Make sure that the specified supply voltages are provided by the power grid. There is a label with safety instructions on the backside of the rack.



Do not squeeze or twist the electrical cables of the SYSRACK-TGX. The respective national electrotechnical rules and regulations are applicable.

2. Overview

2.1 Components

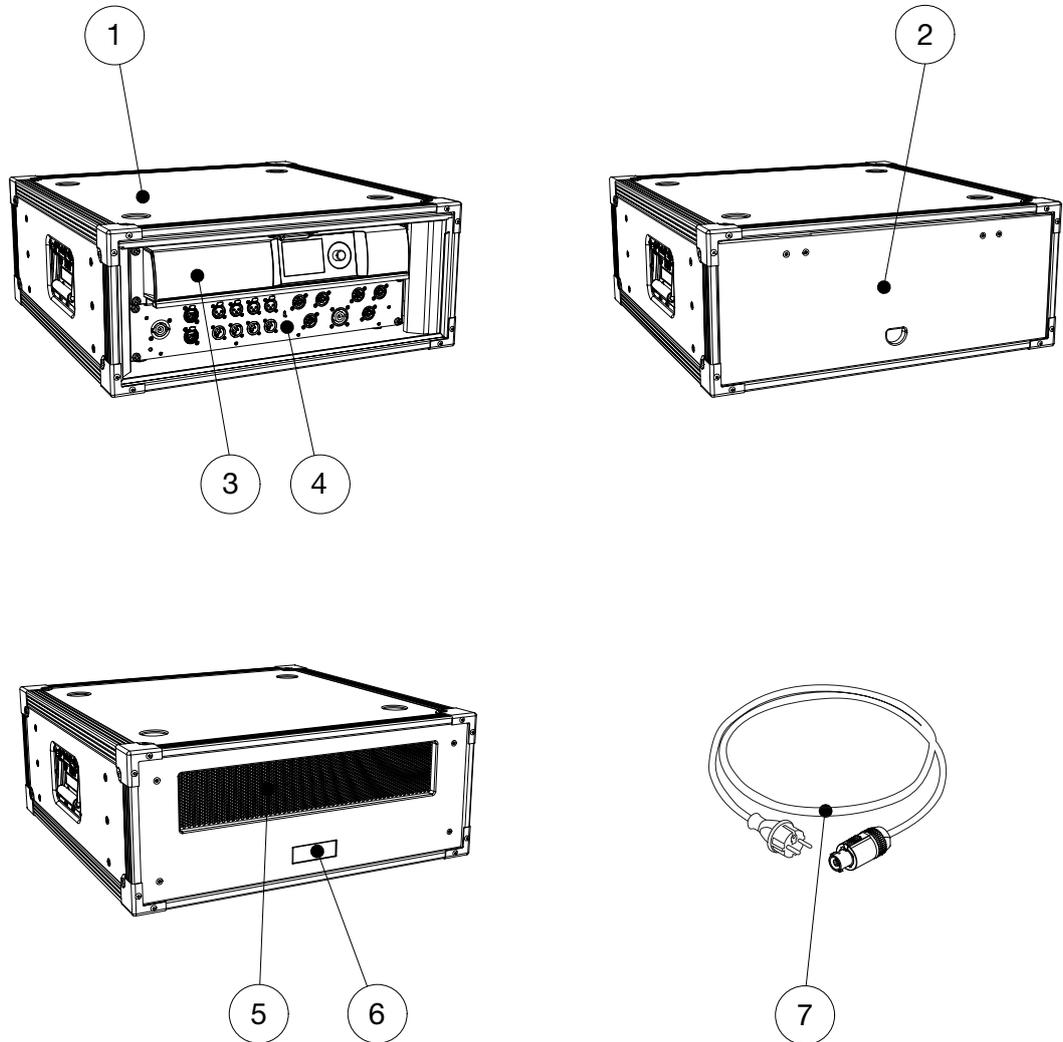
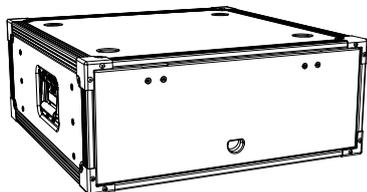


Figure 2.1 - Overview

1. Rack4TGX
2. Slide-in front lid
3. Dynacord TGX10 power amplifier
4. APL7 connection panel
5. Ventilation grille
6. Nameplate
7. Mains cable (must be ordered separately)

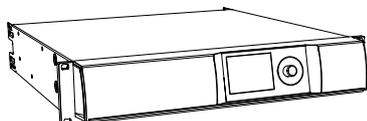
3. Technical specifications

3.1 SYSRACK-TGX



Components	1x Dynacord TGX-power amplifier 1x APL7 connection panel
Size	19" rack 4U
Dimensions (H x W x D)	253 x 600 x 600 mm [9.96 x 23.62 x 23.62 in]
Weight	34 kg [74.96 lbs]
Surface	polyurea-coated

3.2 Dynacord TGX power amplifier

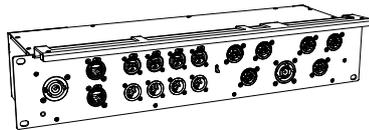


OUTPUT POWER			
Load impedance	2,7 Ω	4 Ω	8 Ω
Maximum output power <small>All channels controlled</small>	3000W	2500W	1250W
Number of amplifier channels	4		
Maximum output voltage	150V _{peak}		
Maximum output current	53A _{peak}		
Frequency response <small>ref. 1 kHz, analog in to speaker out</small>	20Hz bis 20kHz (±0,5 dB)		

DIGITAL SIGNAL PROCESSING	
Filter structures	17 filter per channel, can be implemented in several filter types
Further signal processing parameters	Gain and Delay (0 to 2500 ms) per channel
Other functions	Source selection and mix, level, mute, polarity, sine and noise generator, level meters, impedance measurement, and load monitoring
Source monitoring fallback	AES3 lock and OMNEO-/Dante®-Network monitoring, switching to alternative source selection
Control software	Sonicue

Further technical data for the Dynacord TGX10 power amplifier can be found on the Dynacord website: www.dynacord.com/de

3.3 APL7 connection panel



Mains in	1x Neutrik powerCON®-HC frontseitig
Network PRIMARY / SECONDARY	etherCON®/RJ45 for Dante® audio network and controlling via direct connection to the power amplifier
Audio IN / LINK	2x AES3 in combination and alternative use with 4x analog IN & LINK via XLR
Analog	Maximum input level: +24 dBu Input impedance, active balanced: 20 kΩ Reference level equal to digital input: +21 dBu for 0 dBFS
Digital	Format: AES3 (AES/EBU) Input sample rates: 32 bis 192 kHz, Internal sample rate converter and signal processing
Audio OUT	6x speakON® NL4 1x speakON® NL8

4. Commissioning

4.1 Setup

The SYSRACK-TGX should be used in horizontal orientation.



Please note that due to the weight of the SYSRACK-TGX, two people are required to set up the system.

4.2 Handling

The SYSRACK-TGX has a sliding lid on the front that allows easy access to the devices.

To open the lid, follow these steps:

1. Open the latch on the bottom of the lid.

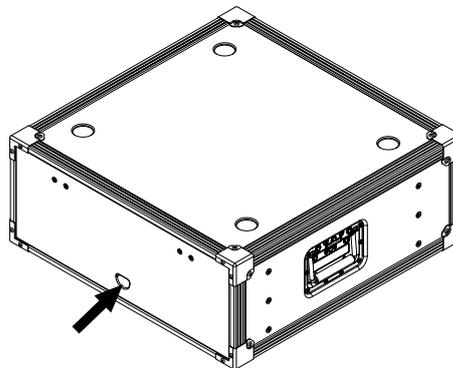


Figure 4.2.1 - Unlock the lid

2. Open the lid.

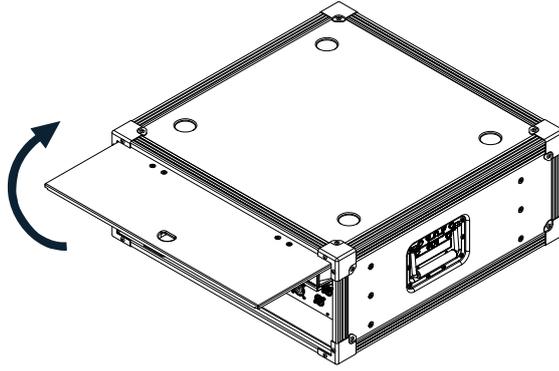


Figure 4.2.2 - Open the lid

3. Slide the lid into the SYSRACK.

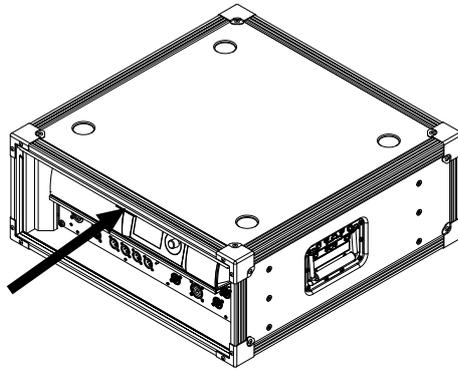


Figure 4.2.3 - Slide the lid into the SYSRACK



Close the lid during transport to avoid damage to the devices.

4.3 Installation

When installing the power amplifier, ensure a sufficient ventilation.

When installing the SYSRACK-TGX, be sure to maintain a minimum distance of 0.6 m at the front and rear. This minimum distance ensures sufficient ventilation of the SYSRACK-TGX. Also ensure that the sliding lid is fully open and slid into the rack during operation.

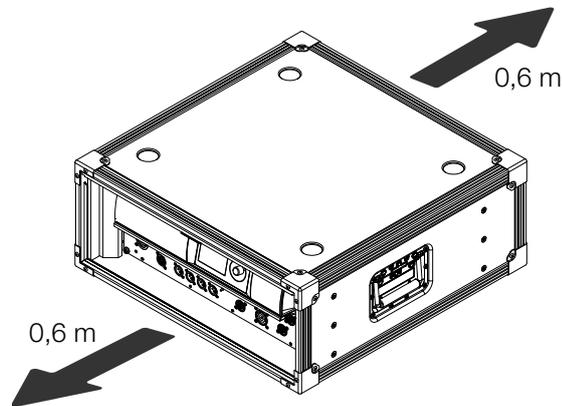


Figure 4.3.1 - Minimum distance



Never block the amplifier's ventilation slots. Keep the ventilation slots free of dust to ensure proper airflow.



Without sufficient ventilation, the correct functionality and operational safety of the amplifier cannot be guaranteed. Insufficient ventilation can cause damage to the product.

Do not use the power amplifier in direct sunlight or near devices such as heaters, stoves or other sources that emit heat.

Do not use the amplifier in an environment with temperatures below 5 °C or above +40 °C.



For a fixed amplifier installation in a dedicated control room that has a central air cooling system or air conditioning, it may be necessary to calculate the maximum heat dissipation.

4.4 Transport

Position a maximum of four SYSRACK-TGX on top of each other on a dolly. Make sure that the setup is securely positioned so that it can't tip over.

Fix all SYSRACK-TGX with a lashing strap with a ratchet to the dolly!

Make sure that the lashing strap is pulled tightly and twist-free around the stack.

Do not put the lashing strap over the front lids of the SYSRACK-TGX.



When pushing, moving and transporting several SYSRACK-TGX on one dolly, please note that the center of gravity is higher, which increases the risk of tipping.

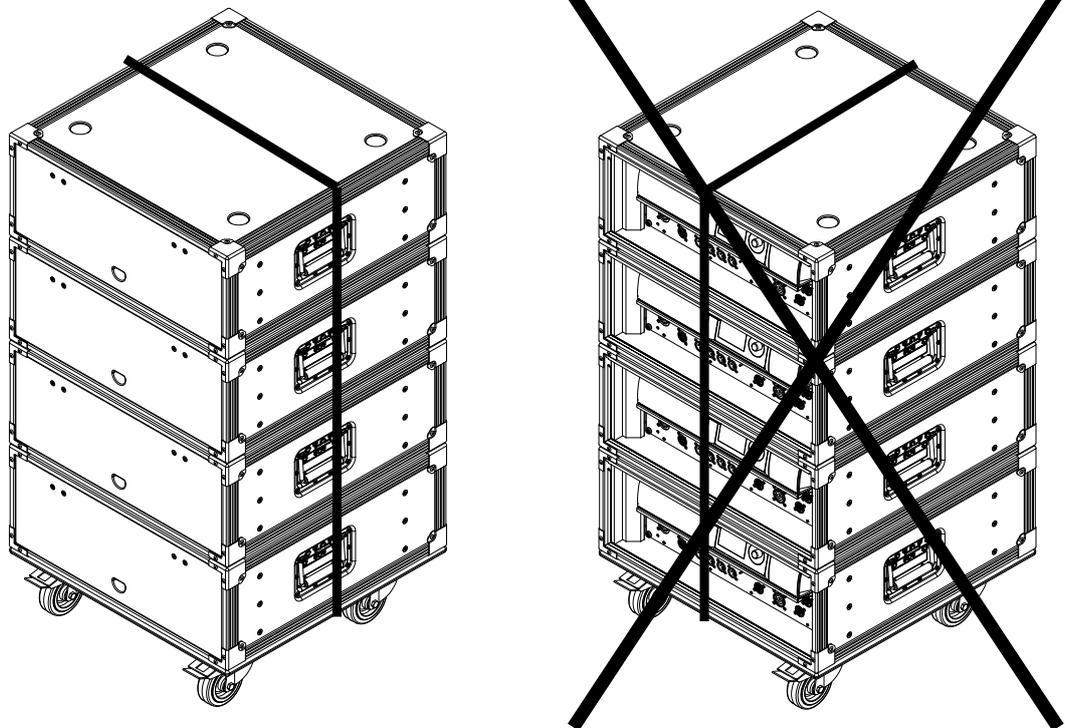


Figure 4.4.1 - Position of the lashing strap

4.5 Service and maintenance

Only clean the rack, the sliding lid, all other parts and the included devices with a dry cloth!

The rack can be cleaned from the outside with a light brush.

Information about worldwide service and spare parts can be obtained from the TWAUDI^o service department. E-Mail to: service@twaudio.de

4.6 Internal wiring

The SYSRACK-TGX is pre-wired and provides all of the amplifier's connections on the front of the rack. It includes an APL7 connection panel specially developed and designed for operating a four-channel power amplifier of the Dynacord TGX series.

The SYSRACK-TGX is designed for operation in larger speaker systems and therefore allows for quick and easy cabling of multiple racks. The panel combines all connections for the power amplifier, the power connector, audio and network (OMNEO, Dante®). The panel has integrated and switchable LED lighting.



The panel is designed for use in the SYSRACK-TGX from TWAUDI^o and should not be used for other purposes outside the rack.

The panel is not protected against dripping, spraying or splashing water, IP20.

4.7 Mains voltage



Please note that there is a risk of electric shock or fire if the mains cable or power connector is damaged!



The SYSRACK-TGX must only be operated via a mains power supply with a safety ground connector. Do not disconnect or cover the safety ground connection of the power cable.

Replace the mains cable immediately if the cable or connector is damaged!

Ensure that the power connector is only plugged and unplugged if the device is free of voltage.



Make sure that the specified supply voltages are provided by the power grid. There is a label with safety instructions on the backside of the rack.

Technical specifications

Mains voltage	100 - 240V ~ 50 - 60Hz
Rated power consumption	1200W

The Powercon connector in the APL7 connection panel is used to connect to the supply network. A corresponding mains cable must be ordered separately.

4.8 Network



Please note that the use of high-quality cables is essential for reliable operation of the SYSRACK-TGX.

At least the CAT5e classification is required for network cables. CAT6 or higher is recommended.

The SYSRACK-TGX allows three different network modes.

1. GLITCHFREE (standard amplifier configuration) – Dante®/OCA on two separate networks in Primary/Secondary configuration.
2. RSTP - The Rapid Spanning Tree Protocol enables closed-loop cabling in the network configuration. In case of network failures or in case of a link failure, the network is reconfigured to the remaining branch. This switch is typically characterized by a short audio interruption.
3. TRANSPARENT – The network chip in the amplifier works as a switch. This allows several amplifiers to be connected in serial. Closed-loop cabling must be avoided!

The network socket with the label PRIM represents the connection of the primary network. The network socket with the label SEC represents the connection of the secondary network.

In the TRANSPARENT network mode, several racks can be wired serially.

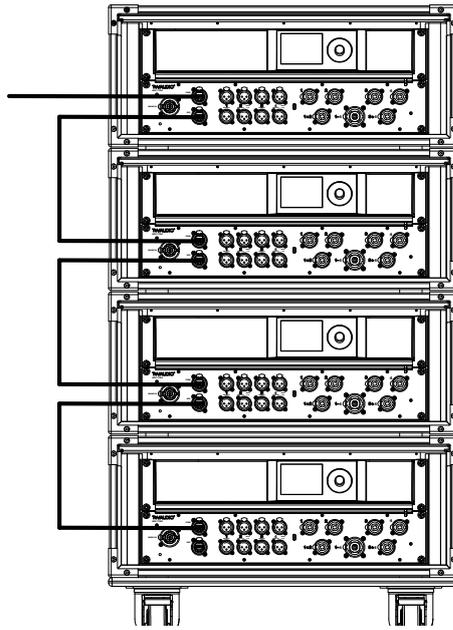


Figure 4.8.1 - System cabling network mode TRANSPARENT



A failure of a device in a serial network (daisy chain) will also affect the connection of the following devices. If one device fails, the subsequent devices are also no longer connected to the network.

In GLITCHFREE network mode, the rack is connected to two independent networks (primary and secondary). This structure is redundant for the control and audio signals via OCA and Dante®.

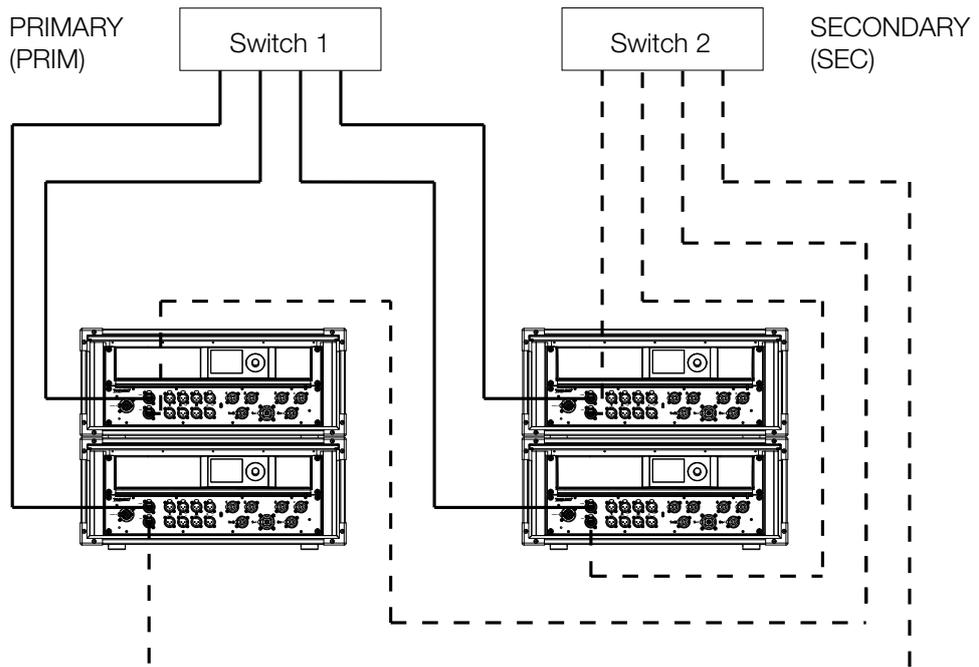


Figure 4.8.2 - System cabling network mode GLITCHFREE



For reliable operation, especially of larger amplifier configurations with Dante®/OCA, a redundant network topology and cabling is always recommended.



If no or only one Dante® audio signal is used as an input source, signal redundancy can also be implemented via the digital AES/EBU or analog inputs.

Technical specifications

Type	2x Neutrik etherCON®/RJ45, redundant primary/secondary
Format	1000BASE-T/100BASE-TX, integrated switch
Network audio inputs	8 channels, 48/96 kHz, OMNEO-/Dante® format

4.9 Audio inputs

The APL7 connection panel provides the input (IN) sockets and the associated link (LINK) sockets for four digital AES3 and four analog inputs. The sockets are designed as 3-pin XLR connectors.

Input sockets 1 and 3 are connected in parallel to their corresponding link sockets.

The input sockets 2 and 4 are used for both digital and analog input signals. The switching between analog and digital inputs is done internally in the amplifier. The AES3 inputs are buffered when the amplifier rack is connected to power.

The link sockets allow an easy wiring of several SYSRACKS-TGX without an additional signal distribution. The input side is always terminated. The output side requires no additional termination. In case of a mains power failure or an analog signal input the active buffering is bypassed and the signal is forwarded without processing.

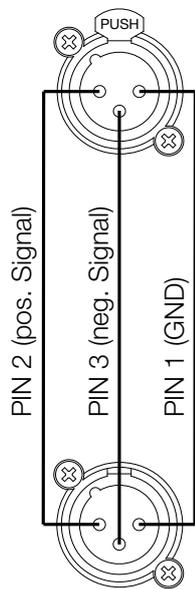


Figure 4.9.1 - Passive link of the input signal (inputs 1 and 3)

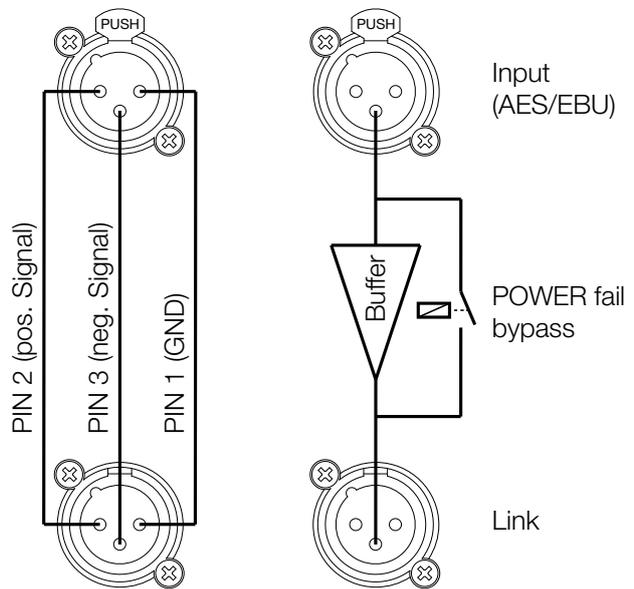


Figure 4.9.2 - Buffered link of the input signal (inputs 2 and 4)

Due to the dual purpose of the input sockets 2 and 4, either digital or analog signals can be used as a source. This can lead to the fact that certain combinations of signal routing cannot be selected as a FAILOVER source in the Sonicue remote control software.

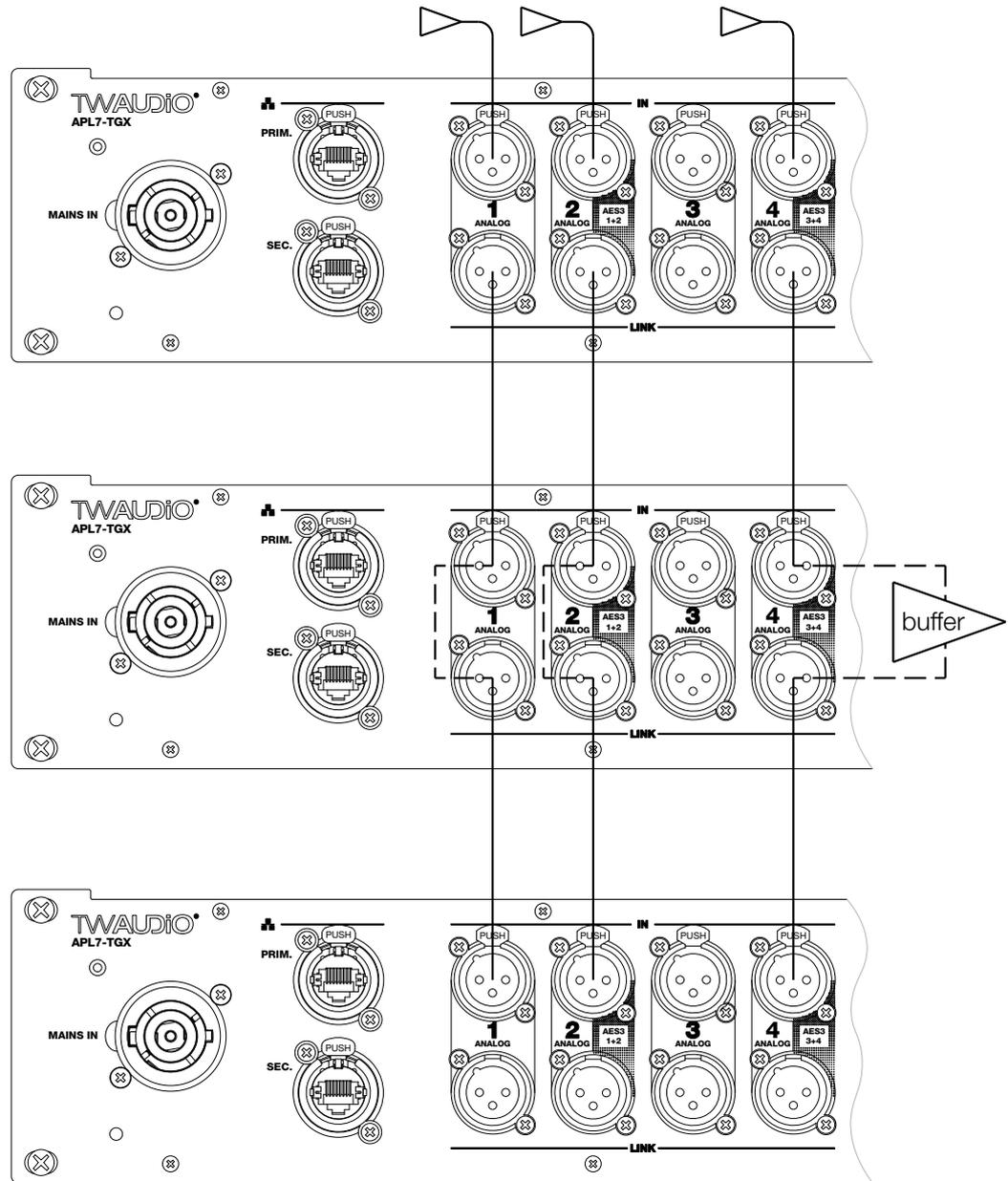


Figure 4.9.3 - Wiring of several SYSRACK-TGX with APL7



A redundancy from AES/EBU (DEFAULT) to analog (FAILOVER) could still be achieved by feeding the AES signal via input socket 4 and the two analog signals via input sockets 1 and 2. The DEFAULT and FAILOVER inputs must be defined accordingly in the Sonicue remote control software or on the amplifier's front panel.



For AES3, cables with a characteristic impedance of 110Ω is recommended.



The maximum number of devices connected in parallel in analog operation is determined by the impedance ratio of the output impedance of the sending device to the input impedance of the amplifier (receiving device) as well as the output power of the sending device.

Technical specifications

ANALOG INPUT / LINK	
Type	4× 3-pole, XLR socket (dual use of analog input/link)
Maximum input level	+24 dBu
Input impedance, active balanced	20 kΩ
Reference level equal to digital input	+21 dBu for 0 dBFS
DIGITAL INPUT / LINK	
Format	AES3 (AES/EBU)
Input sample rates	32 to 192 kHz, internal sample rate converter
Connection LINK	active signal processing, direct bypass, when device is without power

4.10 Power outputs

The APL7 connection panel provides NL4 and NL8 type output connectors. The following table describes the internal wiring to the connectors sockets.

OUT	Connector type	Pair 1+/-	Pair 2+/-	Pair 3+/-	Pair 4+/-
1	NL4	Ch1	Ch1		
1+2	NL4	Ch1	Ch2		
2	NL4	Ch2	Ch2		
1-4	NL8	Ch1	Ch2	Ch3	Ch4
3	NL4	Ch3	Ch3		
3+4	NL4	Ch3	Ch4		
4	NL4	Ch4	Ch4		

For more information on power output wiring, refer to the manual „APL Output Wiring“

4.11 LED-lighting

The APL7 connection panel has integrated lighting with an internal power supply. The lighting can be switched on and off using the switch in the center of the connection panel.

5. Transport and Storage



NOTE

When transporting and storing the unit, it is important to ensure that the surfaces of the SYSRACK-TGX are not damaged. Moisture can penetrate through exposed wood surfaces and cause the wood to swell. Furthermore, it may penetrate where steel surfaces are damaged by scratches and result in corrosion.

For this reason, ensure safe, secure, dry and almost dust-free storage conditions during transport.

6. CE Conformity Declaration

Copy and translation of the original CE Conformity Declaration:



We hereby declare that the below-referenced components by virtue of their design and construction, and in the configuration placed on the market by us, satisfy the safety and health requirements of the applicable EC directives. This declaration becomes invalid in case of modifications that have not been approved by us.

This declaration applies to the following components

- SYSRACK-TGX

as well as all model variants based on these, provided that they correspond to the original factory models and have not been technically modified in any way.

Applicable directives:

- 2001/95/EG
- 2011/65/EU

Applicable national standards and technical specifications:

- DIN EN 18800
- DIN EN ISO 12100
- DGUV Vorschrift 17 und 18
- EN 50581: 2013-02

Berlin, Germany, January 1st, 2021

A handwritten signature in black ink, appearing to read 'Wüstner', written in a cursive style.

Bernhard Wüstner

7. Disposal

It is prohibited to dispose of used electrical equipment with household refuse.



All TWAMBO GmbH products are so-called B2B-products. This means that they are sold by a commercial business to a commercial business. TWAMBO products that bear the trash can symbol shown here may only be disposed of by TWAMBO.

The loudspeaker owner is legally responsible for proper disposal of used devices that do not bear this symbol. This pertains to all products delivered prior to March 29, 2010. Nevertheless, TWAMBO will also be happy to assist you in this case.

If you have any question regarding the disposal of used devices, please contact us under the following telephone number:

+49 (0) 71 41 - 48 89 89 0

Thus, TWAMBO is in strict compliance with the Waste Electrical and Electronic Equipment Directive (2012/19/EU) for the protection of our environment.

TWAMBO is registered under the following WEEE-reg.-no. with the German National Register EAR as a B2B-manufacturer and distributor of electrical devices:

DE93295191

In countries outside of the European Union, comply with local regulations.

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