



Operation Manual



XiT Series

XiT4

DSP System Amplifier

Keep these important operating instructions.
Check www.tecnare.com for updates.

General Information

XiT4 Operation Manual

Ver.: 1.2_UK 05/2019

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The information contained in this manual has been carefully checked for accuracy, at the time of going to press, however no guarantee is given with respect to the correctness.

Exel Acoustics SL accepts no responsibility for any errors or inaccuracies that may appear in this manual or the products and software described in it. Technical specifications, dimensions, weights and properties do not represent guaranteed qualities. As manufacturers we reserve the right to make alterations and modifications within the framework of legal provisions, as well as changes aimed at improving quality.

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IMPORTANT SAFE INSTRUCTIONS

Before using our product, be sure to carefully read the manual and safe Instructions. Keep this document with the device all time.

1. Read these instructions

2. Keep these instructions.

3. Heed all warnings.

4. Follow all SAFETY INSTRUCTIONS as well DANGER and OBLIGATION warnings.

5. Only use attachments / accessories specified by Exel Acoustics SL.

6. Do not use this apparatus near water.

7. Clean only with dry cloth.

8. Do not block any ventilation openings. Install in accordance with Exel Acoustics' instructions.

9. Do not install near any heat sources such as radiators, heat registers, stoves or other apparatus (including amplifiers) that produce heat.

10. Do not defeat the safety purpose of the polarized or grounding type plug. A polarized plug has two blades with one more wide than the other. A grounding type plug has two blades and a third pin are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

11. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles and the point where they exit from the apparatus.

12. Unplug this apparatus during lightning storms or when unused for long periods of time.

13. Refer all servicing to qualified service personnel. Service is required when the apparatus has been damaged in any way, such as power-supply cord or plug damaged, liquid has been spilled or objects have fallen into the apparatus, this apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

CAUTION: To reduce the risk of fire of electric shock, do not expose this device to rain or moisture.

14. Use the mains plug to disconnect the device from mains.

15. Do not expose this equipment to dripping or splashing and ensure that no objects filled with liquids, such as vases, are placed on the equipment.

16. The mains plug of the power supply cord shall remain readily operable.

17. Do not connect the unit's output to any other voltage source, such as battery, mains source, or power supply, regardless of whether the unit is turned on or off.

18. Do not remove the top (or bottom) cover. Removal of the cover will expose hazardous voltages. There are no user serviceable parts inside and removal may void warranty.

19. If the equipment is used in a manner not specified by the Exel Acoustics, the protection by the equipment may be impaired.

CAUTION: Do not remove any covers, loosen any fixings or allow items to enter any aperture

CAUTION: The rear of the product may get hot. Avoid direct skin contact during operation and for at least 5 minutes after power has been isolated.

CAUTION: The product must only be positioned at floor level when operated in a horizontal position.

IMPORTANTES INSTRUCCIONES DE SEGURIDAD

Antes de usar este producto, asegúrese de leer cuidadosamente el manual y las instrucciones de seguridad.

1. Lea estas instrucciones.
2. Conserve estas instrucciones.
3. Respete y siga todas las advertencias.
4. Siga todas las INSTRUCCIONES DE SEGURIDAD, así como las advertencias de PELIGRO y OBLIGACIÓN.
5. Utilice solo accesorios autorizados por Exel Acoustics SL.
6. No use este aparato cerca del agua.
7. Limpiar solo con un paño seco.
8. No bloquee las aberturas de ventilación e intalar de acuerdo con las instrucciones de Exel Acoustics.
9. No instale el aparato cerca de fuentes de calor tales como radiadores, calefactores estufas u otros aparatos que produzcan calor.
10. Esta unidad debe ser conectada mediante un cable de alimentación de 3 hilos. Por razones de seguridad, LA CONEXIÓN A TIERRA NO DEBE DESCONECTARSE EN NINGUNA CIRCUNSTANCIA.
11. Proteja el cable de alimentación de ser pisado o aplastado, especialmente los enchufes, receptáculos y en el punto en el que salen del aparato.
12. Desconecte este aparato durante tormentas eléctricas, terremotos o cuando no vaya a emplearse durante largos periodos.
13. Confíe las reparaciones a personal cualificado. Se requiere servicio cuando el aparato ha sido dañado de alguna manera como por ejemplo si el cable de alimentación o el enchufe está dañado, se ha derramado líquido o han caído objetos dentro del aparato,

el aparato ha sido expuesto a lluvia o a la humedad, no funciona con normalidad o se ha caído.

PRECAUCIÓN: Para reducir el riesgo de incendio por descarga eléctrica, no exponga este aparato a la lluvia o a la humedad.

14. Desconecte completamente este aparato de la red eléctrica desconectando el cable de alimentación.
15. No exponga este equipo a salpicaduras ni coloque sobre él objetos que contengan líquidos, tales como vasos o botellas. Equipo IP20.
16. El enchufe o la conexión a red debe ser fácilmente accesible.
17. No conecte la salida de la unidad a ninguna otra fuente de voltaje, como batería o fuente de alimentación independientemente de si la unidad está encendida o apagada.
18. No retire la cubierta superior (o inferior). La retirada de la cubierta lo expondrá a voltajes peligroso. No hay piezas reparables por el usuario en el interior y su extracción podría anular la garantía.
19. Si el equipo se utiliza de la forma no especificada por Exel Acoustics, la protección del equipo puede verse afectada.

PRECAUCIÓN: No retire la cubierta, afloje tornillos o permita la entrada de elementos por ninguna abertura

PRECAUCIÓN: La parte trasera del equipo puede calentarse. Evite el contacto directo con la piel durante su funcionamiento y durante, al menos, 5 minutos después de que se haya apagado

PRECAUCIÓN: El equipo solo debe colocarse en el suelo cuando se opera en posición horizontal.

SYMBOL USED

			
Dangerous voltages; risk of electrical shock	Important operating instructions	Frame or chassis	Protective earth ground
Pour indiquer les risques résultant de tensions dangereuses	Pour indiquer important Instructions	Masse, chassis	Terre de protection
Warnung vor gefährlicher elektrischer Spannung	Wichtige Betriebsanweisung oder Gebrauchsanleitung	Rahmen oder Gehäuse	Masse Schutzleiter
Presencia de voltajes peligrosos	Importantes instrucciones operativas	Masa o chasis	Puesta a tierra



DO NOT EXPOSE TO
RAIN OR MOISTURE



NE PAS EXPOSER A LA
PLUIE NI A L'HUMIDITE



AVERTISSEMENT DE SECURITE

Pour déconnecter l'appareil de l'alimentation principale de façon permanente, débranchez le connecteur du câble fourni à l'arrière de l'appareil.

Ne retirez pas les couvercles, ne desserrez pas les fixations et ne laissez aucune pièce s'introduire dans les ouvertures.

Ne placez pas d'objets contenant du liquide à proximité de l'appareil.

Ne remplacez le fusible de réseau principal que par un fusible du même type.

Le radiateur arrière de cet appareil devient chaud. Evitez tout contact direct avec la peau pendant le fonctionnement et au moins 5 minutes après la mise hors tension de l'appareil

STANDARDS

FOR CUSTOMERS IN EUROPE



This product complies with both the LVD (electrical safety) 73/23/EEC and EMC (electromagnetic compatibility) 89/336/EEC directives issued by the commission of the European community.

Compliance with these directives implies conformity with the following European standards:

EN60065	Product safety
EN55103-1	EMC emissions
EN55103-2	EMC immunity

This product is intended for the following electromagnetic environments: E1, E2; E3 & E4.

THIS PRODUCT MUST BE EARTHED. Use only a flexible cable or cord with a green and yellow core which must be connected to the protective earthing terminal of a suitable mains plug or the earthing terminal of the installation. The cord must be a maximum of 2m long, have a 2.5mm² CSA, a 300/500V rating and comply with EN50525-2-11 / H05W-F.

THIS PRODUCT IS DESIGNED FOR PERMANENT INSTALLATION. It must be fitted in to a 19" rack enclosure and not operated unless so installed. The rack enclosure should be open at the front and back to allow free ventilation and movement of air through the product.

FOR CUSTOMERS IN THE USA

This product has been tested for electrical safety and complies with UL60065 7th edition

THIS PRODUCT MUST BE EARTHED. Use only a flexible cable or cord with a green or green / yellow core which must be connected to the protective earthing terminal of a suitable mains plug or the earthing terminal of the installation. The cord must be a maximum of 6' long, be 14AWG, have a rating SJ, SJT, SJE or 300/500V H05W-F and be marked VW-1.

THIS PRODUCT IS DESIGNED FOR PERMANENT INSTALLATION. It must be fitted in to a 19" rack enclosure and not operated unless so installed. The rack enclosure should be open at the front and back to allow free ventilation and movement of air through the product.

DECLARATION OF CONFORMITY WITH FCC RULES

We, EXE Acoustics SL, CL Encinar 282, Pol. Ind. Monte Boya, 45950 - Casarrubios del Monte (Toledo), España, declare under our sole responsibility that this family of devices, 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.

FEDERAL COMMUNICATIONS COMMISSION NOTICE

An example of this equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential and commercial installation.

This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the distance between the equipment and the receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

FOR CUSTOMERS IN THE CANADA

This product complies with CA /CSA C22.2 No.60065-03
Ce produit est conforme avec CA /CSA C22.2 No.60065-03

THIS PRODUCT MUST BE EARTHED. Use only a flexible cable or cord with a green or green / yellow core which must be connected to the protective earthing terminal of a suitable mains plug or the earthing terminal of the installation. The cord must be a maximum of 6' long, be 14AWG, have a rating SJ, SJT, SJE or 300/500V H05W-F and be marked VW-1.

CE PRODUIT DOIT ÊTRE MIS À LA TERRE. Utilisez uniquement un câble souple avec un noyau vert ou vert / jaune qui doit être relié à la borne de terre de connecteur d'alimentation ou la borne de terre de l'installation. Le cordon doit être un maximum de 6' (2m) de long, 14 AWG (2.5mm² CSA), être classé SJ, SJT, SJE ou 300/500V H05W-F et être marquée VW-1.

THIS PRODUCT IS DESIGNED FOR PERMANENT INSTALLATION. It must be fitted in to a 19" rack enclosure and not operated unless so installed. The rack enclosure should be open at the front and back to allow free ventilation and movement of air through the product.

CE PRODUIT EST CONÇU POUR UNE INSTALLATION PERMANENTE. Il doit être installé dans un boîtier rack 19-in. Le rack devrait être ouvert à l'avant et l'arrière pour permettre la ventilation et le mouvement d'air libre à travers le produit .

DECLARATION OF CONFORMITY WITH CANADIAN ICES-003

This Class B digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

DECLARACIÓN DE CONFORMIDAD

DECLARATION OF CONFORMITY

EXEL ACOUSTICS SL

CL Encinar, 282. Polígono Industrial Monte Boyal. 45950 – Casarrubios del Monte (Toledo), España (Spain).

Declara que el amplificador XiT4 y sus respectivas opciones, cumple con los objetivos de las Directivas:

Declare under our sole responsibility that the XiT4 amplifier products comply with relating Directives:

- (1) Directiva de Baja Tensión - 2014/35/UE
- (2) Directiva de Compatibilidad Electromagnética - 2014/30/UE
- (3) Directiva RoHS - 2011/65/UE
- (4) Directiva RAEE - 2012/19/UE



- (1) Low Voltage Directive 2014/35/EU*
- (2) EMC 2014/130/EU*
- (3) RoHS Directive 2011/65/EU*
- (4) WEEE Directive 2012/19/EU*

Y es conforme a las siguientes Normas Armonizadas Europeas:
In compliance with these Harmonized European Norms:

- (1) EN60065 8th. Audio, video and similar electronic apparatus. Safety requirements.
- (2) EN55032:2012. EMC emissions & immunity.
- (3) EN55035-2017

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1. Welcome and unpacking

1.1. Welcome to Tecnare

Thank you for choosing a Tecnare® XiT4 DSP Amplifier System “**Made in UK**” for your application.

Please spare a little time to study the contents of this manual, so that you obtain the best possible performance from this unit.

All Tecnare® products are carefully engineered for world-class performance and reliability.

If you would like further information about this or any other Tecnare® product, please contact us. We look forward to helping you in the near future.

As part of a continuous evolution of techniques and standards, Exel Acoustics SL as manufacturer of Tecnare® products reserve the right to change the specifications of its products and the content of its documents without prior notice.

Updates and supplementary information are available on the Tecnare® website:

<http://www.tecnare.com>

Tecnare Technical Support is available at:

- (T): +34 918 170 110 - +34 918 171 001
- (e-mail): support@tecnare.com

Thank you again for placing your confidence in Tecnare® products.

1.2. Unpacking

After unpacking the unit please check carefully for damage. Every Tecnare product is tested and inspected before leaving the factory and should arrive in perfect condition. If damage is found, please notify the carrier concerned at once. You, the consignee, must instigate any claim. Please retain all packaging in case of future re-shipment.

1.3. The User Guide

This user manual gives a progressively more detailed description of the functions of the Tecnare XiT4 Amplifier. A pages quick reference guide is provided for those users who are experienced with this type of equipment and just need to know how to ‘drive’ the front panel. A detailed explanation of the front and rear panel controls and indicators is contained in the next section.

The final section describes each individual function or feature with annotated images explaining its use. Where appropriate, the graphical display is shown to further elaborate on the units operation.

To complete the manual a reference section is included, describing the technical performance and Mechanical drawing of the device complete with graphs of filter responses.

2. Introduction and Key Features

2.1. Introduction

The XiT4 DSP amplifier systems integrate light-weight power supplies, high power sonically transparent class D amplifiers, complete system monitoring and a fully featured USB or network controlled 24 bit 96kHz DSP processing platform as standard.

2.2. Key features

- *One or two dual amplifier sections: two or four channels*
- *Each section is completely independent with discrete PSU, amplifier and DSP*
- *Fully featured PC control and telemetry of single devices or networks as standard*
- *Class D amplifier stages*
- *Minimal signal path and refined DSP algorithms for clean, dynamic and musical audio performance*

2.3. Mechanical Installation

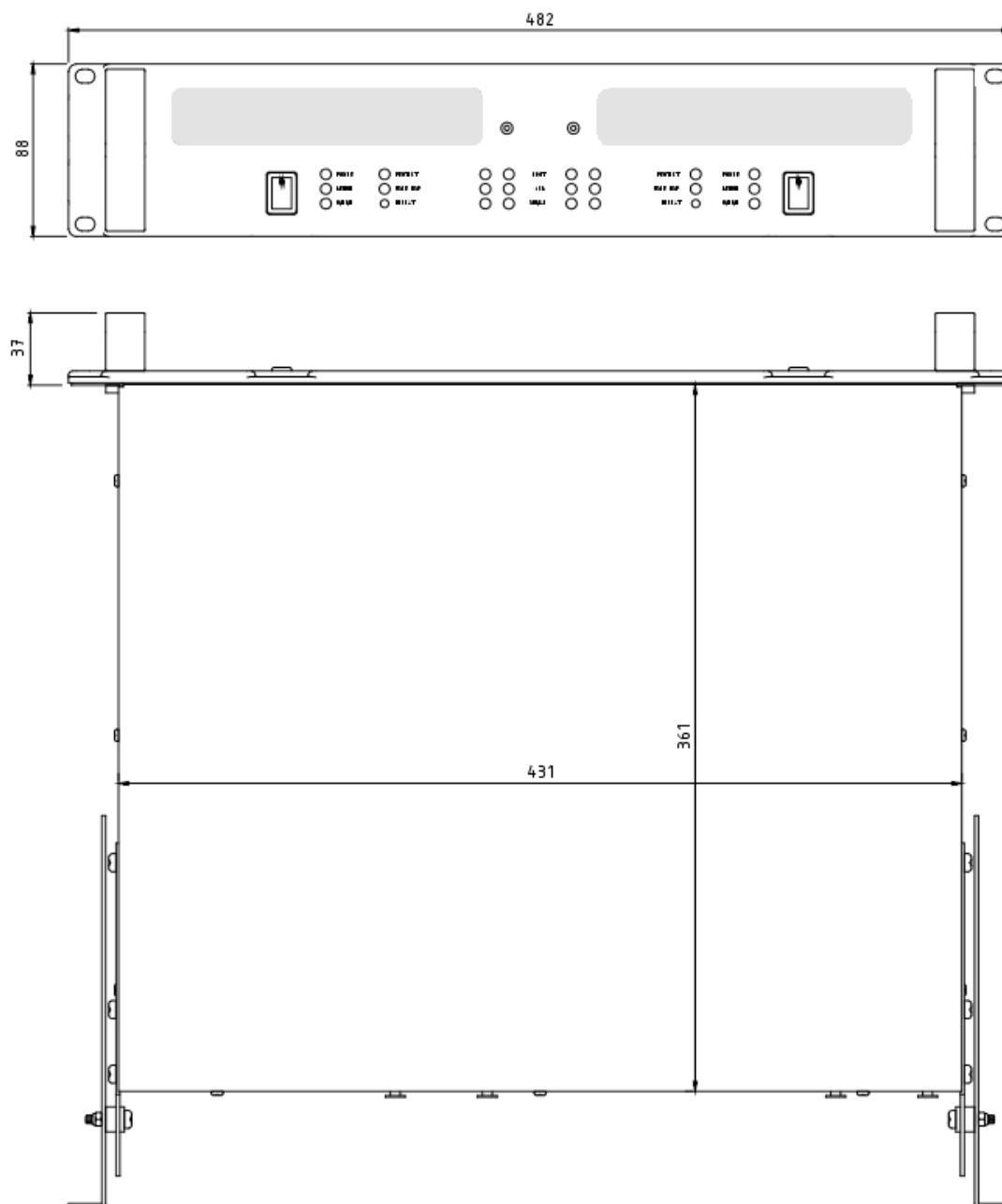


Fig. 1 Dimensional drawing

The XiT4 DSP amplifier system is designed to be mounted in a standard 19" rack enclosure.

Where the amplifier is used in a fixed installation, it is possible to use only the front panel 19" rack mounting holes to mount it in a standard rack enclosure. If the amplifier is mounted in a mobile rack it is recommended that the rear rack mounting kit is fitted so the amplifier can be well supported. Damage caused by insufficient support is not covered by the warranty.

To prevent damage to the front panel it is recommended that plastic cups or washers are fitted underneath the rack mounting bolt heads.

It is possible to mount multiple XiT4 amplifiers without ventilation gaps between them but it is essential that an unobstructed flow of clean air is available from the back of the unit to the front. It is important the neither the air intakes at the rear of the unit or the exhaust vents at the front are covered.

The amplifier should never be exposed to rain or moisture during operation or storage. If the unit does come into contact with moisture, remove the AC power cord immediately and leave it in a dry and warm location to dry out.

Note that when any equipment is taken from a cold location into a hot humid one, condensation may occur inside the device. Always allow time for the equipment to attain the same temperature as its surrounding environment before connecting the AC power cord.

2.4. AC Power Connection



IMPORTANT: *THIS APPLIANCE MUST BE GROUNDED*

The amplifier must always be connected using a 3-wire, grounded AC supply. The framework of the rack mount enclosure should also be connected to the same grounding circuit. The unit should never be operated unless the AC power cable ground is correctly terminated; this is important for personal safety and for control of the system grounding.

The amplifier is supplied with a Neutrik PowerCon™ type locking AC power connector. Use only an AC power cord with a correctly terminated PowerCon™ type connector to make the connection to the mains power supply.

The XiT4 amplifiers are designed to operate on 50/60 Hz AC power. The power supply sections automatically configure themselves for either 115V or 230V nominal voltage at turn on. The amplifiers will operate over an extended range of supply voltages from; nominal 115V / 230V +/- 10%.

Note that whilst the amplifier will operate correctly at voltages indicated, the specified output power will only be achieved when operating with the stated nominal voltages.

2.5. Audio Connections

2.5.1. Input Connections

For each input channel there is a female XLR-3 connector for analogue inputs. The XiT4 can be fed with up to four balanced analogue audio signals.

The analogue input panel also features four XLR-3 male link connectors passively wired to the input connectors. They allow transmitting the input signal to daisy-chained amplifier.

The HOT, + or 'in phase' connection should be made to pin 2 of the XLR connector.

The COLD, - or 'out of phase' connection should be made to pin 3 of the XLR connector.

Pin 1 of the XLR connectors is internally connected to the chassis.

The shield of the input cable should always be connected Pin 1 of the XLR to ensure the EMC performance and regulations are met.

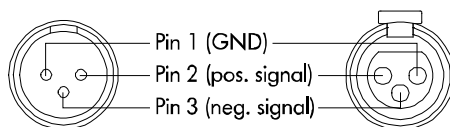


Fig. 02: PIN out assignment XiT4 Analogue Input/Link - Balanced connection

2.5.2. Using unbalanced connection

Please note that the use of unbalanced connections is not recommended, however when connecting the amplifier to an unbalanced audio source, the signal conductor should be connected to XLR pin2. The 'Cold' conductor or cable screen should be connected to XLR pin 1 with a short connection made between pin 1 and pin3 as shown in Figure 03.

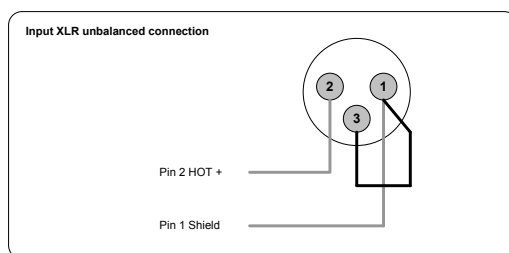


Fig. 03: Balanced to Unbalanced Analogue wiring and PIN out.

2.5.3. Amplifier Output Connections

The **XiT4** amplifier is fitted with one SpeakON™ NL4 connector per amplifier channel. the appropriate conductor terminations are shown below and on the rear panel of the unit.

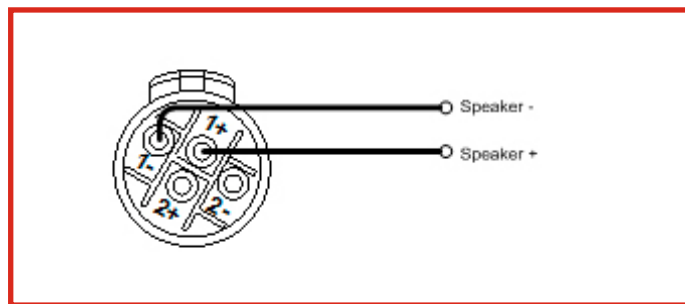


Fig. 04 Amplifier output connections

Additionally, the SpeakON™ NL4 connector for amplifier channel 1 carries the output for amplifier channels 1 and 2. Similarly, the SpeakON™ NL4 connector for amplifier channel 3 carries the output for amplifier channels 3 and 4. This can be useful for making a connection to two loudspeakers with one 4-core cable (i.e. Bi-amp).

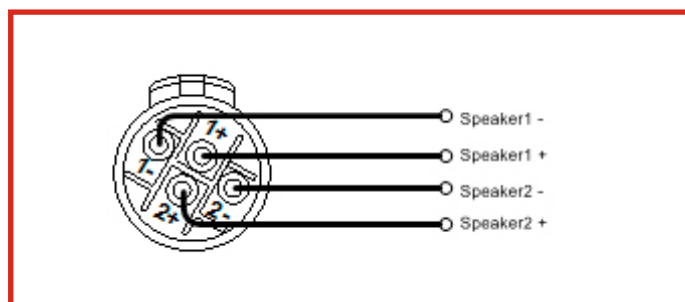


Fig. 05 Amplifier Output Bi-amp connexion (CH1 & CH3)

In addition, the channel 1 or channel 3 connector can also be used if the pair of amplifier channels is being operated in bridged mode.

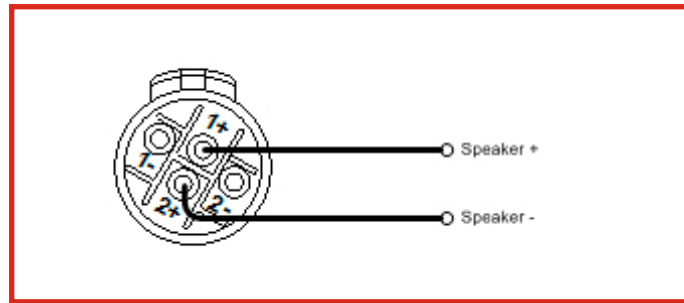


Fig. 06 Amplifier Output Bridge connexion (CH1 & CH3)

2.5.4. Load Matching

Each output of the device can be optimised to drive either a low impedance load (e.g. 2, 4 or 8 Ohms), or a Constant Voltage (C.V.).

A single channel of an XiT4 can deliver 1250W in to 2 Ohms, therefore the RMS voltage at the speaker terminals when delivering this will be $\sqrt{(1,250 \times 2)} = 50V$.

If each channel is not loaded to full capacity of 1,250W (typically a 70V / 100V application will not load it this heavily) then the voltage will be higher than this because the power rails will not be sagging so much; approximately 60V.

Dependent on which voltage you use, a single channel will drive a 70V line to within either 3dB or 1.3dB of maximum and it will drive a 100V line to within 6dB or 4.5dB of maximum.

A bridged pair of channel can deliver 2,500W in to 4 Ohms which equates to an RMS voltage of 100V or approximately 120V with a lower load than the full 2,500W.

Dependent on which voltage you use with a bridged pair of channels, the XiT4 will be able to overdrive a 70V line by either 3dB or 4.7dB and a 100V line being driven perfectly or overdriven by 1.6dB.

3. Front Panel

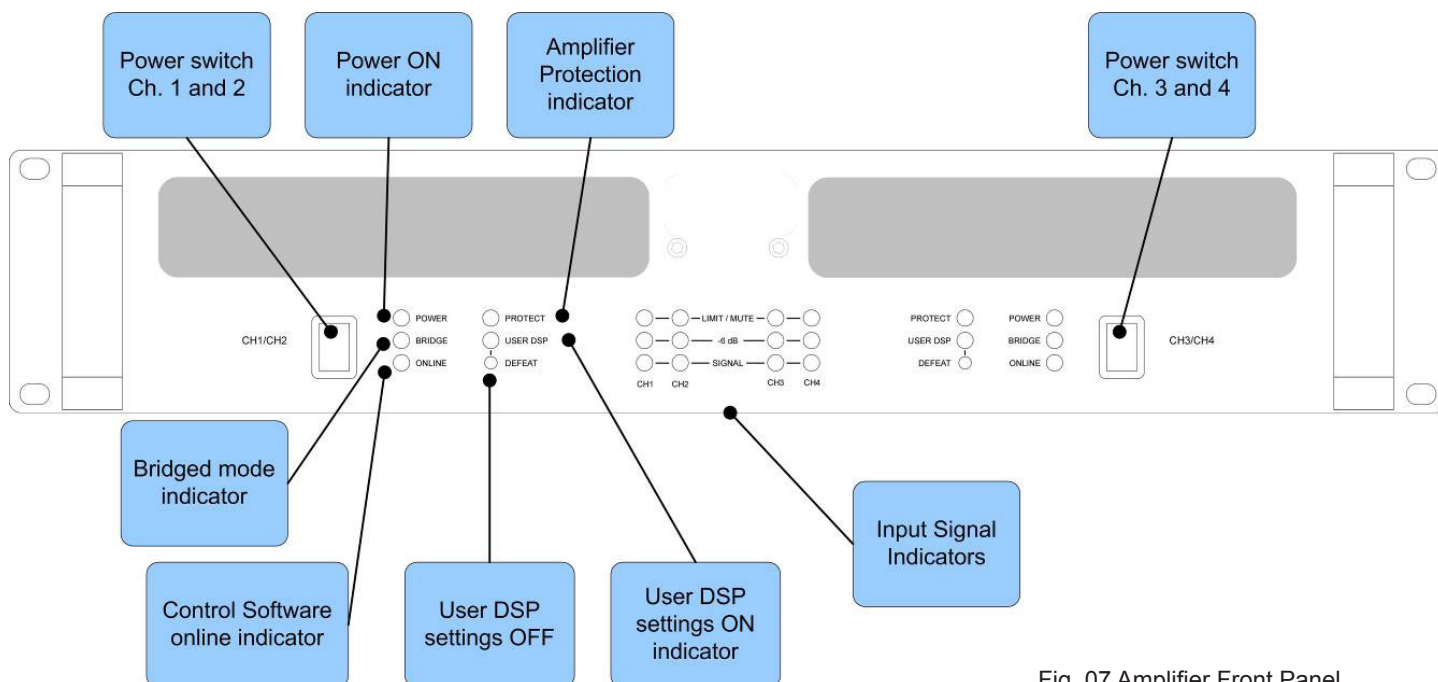


Fig. 07 Amplifier Front Panel

3.5.1. Power Switch

The XiT4 amplifier is fitted with either one or two dual channel power modules. As the power modules operate independently there is a separate power switch for each. When the power switch is operated, the protect indicator will flash while the DSP and amplifier control systems are prepared. After approximately 3-4 seconds the amplifier will be operational and the audio level is gradually ramped up.

3.5.2. Power ON Indicator

Each Power Switch is associated with a POWER indicator. This green indicator is lit when power is applied and the power switch is in the ON position.

3.5.3. Bridge Mode indicator

It is possible to use the dual channel power modules in Bridged Mode. This is enabled using the System Engineer PC control application. Further details on Bridge Mode can be found in the System Engineer control section of this user mode.

3.5.4. Control Software On-Line Indicator

A network of PCC-NET compatible products including the XiT4 range of DSP amplifiers can be controlled, configured and monitored using the System Engineer PC application. The Online indicator will light when the amplifier is correctly connected to system Engineer.

3.5.5. Protect

The XiT4 DSP amplifier system has sophisticated protection and monitoring systems which keep the amplifier within its safe operating window whenever possible. This indicator lights when the protection systems are active in any way.

3.5.6. User DSP indicator

Using the System Engineer PC application the user can introduce audio processing such as EQ, gain and delay. These settings can be bypassed using the User DSP settings defeat button. The indicator will be lit when these DSP settings are in use.

3.5.7. User DSP Setting Defeat button

This button allows the user to bypass the user DSP settings; its status is shown by the User DSP indicator.

3.5.8. Input Signal Indicator

A set of three pairs of indicators show signal present, 6dB below limit, and limit for each channel. The signal present indicators operate at approximately 50 dB below maximum output, giving a useful indication of even relatively low input signal levels. The -6dB indicators are intended to show when the output is almost at maximum level. The Limit indicators warn the user that the output has reached maximum and that the signal limiters are now constraining the output.

4. Rear Panel

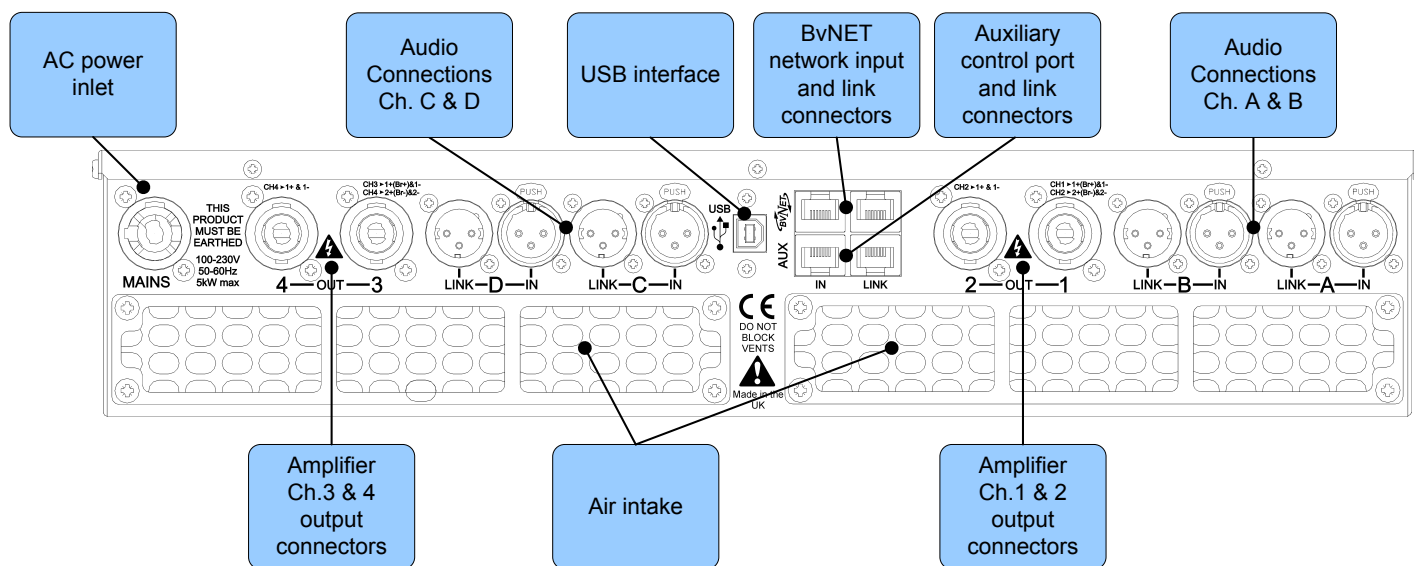


Fig. 07 Amplifier Rear Panel

4.5.1. Power Inlet

The XiT4 amplifier should be connected to a suitable mains electricity supply using the cable supplied. The unit uses auto ranging switch mode power supplies which are capable of operating with a nominal mains voltage of either 115V or 230V, 50/60Hz without re-configuration.

4.5.2. Audio Input Connectors

All audio connections are fully balanced and wired pin-1 ground, pin-2 hot & pin-3 cold. The two inputs have pin-1 connected directly to the chassis and feed the signal processing chains. If an unbalanced source is used, a connection should be made between the pin-3 'cold' signal and the ground connection of the unbalanced source.

4.5.3. Audio Output Connectors

Each amplifier pair has two speaker outputs.

There are two Neutrik Speakon™ connectors for each amplifier pair:

- *Speakon 1 (or 3) carries both channel 1 (or 3) and channel 2 (or 4) outputs*
- *Speakon 2 (or 4) carries channel 2 (or 4) output*
- *For non-bridge connections, use Speakon 1 (or 3) for the first speaker, and Speakon 2 (or 4) for the second speaker. Use pins 1+ and 1-.*

Or alternatively, if you want to have one cable feeding two speakers, use Speakon 1 (or 3) pins 1+ and 1- for the first speaker, and pins 2+ and 2- for the second speaker.

- *For Bridge operation, use Speakon 1 (or 3) pins 1+ and 2+ (1+ for Speaker + and 2+ for speaker -)*

4.5.4. Communications Port Connections

Tecnare XiT4 series DSP amplifiers may be controlled and monitored using the Sistem Engineer PC application. There are two ways of connecting your computer to XiT4:

1. **Using the USB socket (when you want to connect your computer to just one XiB)**
2. **Using the BvNet network sockets (when you want to control several products)**

When using the PCC-Net sockets, you will need to use a PCC-Net USB/RS232 Interface accessory to allow your computer to communicate with the PCC-Net network.

Before connecting a USB port from your computer to either the USB socket on XiT4, or to a PCC-Net USB/RS232 Interface, you will first need to run the USB driver installation utility which you will find on our website: www.tecnare.com

Once the USB driver utility has been installed, you can then plug in your USB lead from your computer. With operating systems such as Windows Vista, Windows7 or Windows 10, you should not need to intervene in any way. With other operating systems (such as XP), you will need to go through the USB driver installation process which will initiate when you plug your USB cable in. This generally involves accepting the default answers. For further help on this process, please see the USB driver installation notes on the CD-ROM or on the website.

When using the PCC-Net Network, you should connect from a Link socket on one device to the In socket on another device. The PCC-Net network may be 'daisy chained' in this way through as many devices as you require (although a sensible limit would be perhaps 24 devices, after which you should consider using more than one PCC-Net USB/RS232 Interface to create more than one sub-network). A PCC-Net network can have a total length of up to 1km using Cat5 cable. If you are using USB to connect to the PCC-Net USB/RS232 Interface, then the Interface will usually power itself via USB. However, if you are using RS232, or if you are using an unpowered USB hub, or you have some network powered BvNet network equipment in the network, then you will need to use an Accessory Power Supply to power the Interface.

The Aux In socket may be used to select between a number of 'Voices' that may have been programmed into the XiT4 using factory files (*.dfa) supplied by Tecnare. These files would be loaded into the XiT4 via the System Engineer application. Tecnare will give you details of how to make connections to the Aux port when using their factory files. The currently selected Voice is indicated on the System Engineer panel. The Aux Out socket allows you to chain the Aux connections on to further XiT4s so that the same voice selection is done on all of them. There is no practical limit to the number of XiT4s that may be chained together via the Aux sockets.



IMPORTANT: Please note that although the PCC-Net and the Aux ports are standard RJ45 sockets, these are **not Ethernet**. Do not connect these to Ethernet equipment.

5. Power Amplifier Control Panel

The XiT4 amplifier is shipped with standard settings in the Digital Signal Processor (DSP) so it will function in the same way as any 'standard' amplifier without on-board processing. However It could be set according to the customer requirement and /or the system served. Each two channel amplifier section contains a fully featured DSP which can be configured to process the audio signals as required for a given application or loudspeaker system. In addition to the digital processing the amplifiers also provide complete telemetry and status information.

The powerful and easy to use System Engineer PC application provides control and monitoring of one unit or a whole network of devices.

System Engineer and related driver software are provided on the CD which comes with the XiT4 amplifier or can be downloaded free from: www.tecnare.com

This section of the user guide explains the functions of the System Engineer control panel for the XiT4 series DSP amplifiers. For further help and information on the main System Engineer application please click on the help button on the main application. For more detailed help about the XiT4 control panel, click the "?" in the right-hand corner of the XiT4 control panel in System Engineer.

5.1. Amplifier Channels

It is important to realise that each two channel amplifier section contains its' own DSP. So a four channel amplifier is logically split into two sections, each with two channels. There is an independent two channel control panel associated with each section. Each section will appear in System Engineer as an independent 'device' in the Network Tree.

The Tree will add the Device Name with the Role Number for each of the sections in square brackets. The Role Number 1 section is for Channels 1 and 2, and Role Number 2 for channels 3 and 4.

The descriptions of the System Engineer control panel therefore relate to a 2-channel section. The amplifier has two or four inputs and two or four outputs. There is not necessarily a 1:1 correspondence between inputs and output because the routing between inputs and outputs may be changed; either by you or by the amplifier vendor (see the Hidden Controls section for more details). For example, one input may be used to feed two outputs.

5.2. User Controls

The control panel for the DSP amplifier allows the parameters to be viewed and adjusted. The panel may have one of two different formats: A monitoring panel (the 'MonIcon') where the status of the amplifier may be viewed, or a full control panel where all the controls to adjust parameters are located. The full panel has a 'tabbed' area which allows you to choose from a number of different areas of interest.

There are some controls such as mute, which are displayed constantly; the remaining parameter controls being organised into tabbed groups depending upon function.

5.3. Monitoring Section (MonIcon)

This allows you to view what is going on inside the amplifier at a glance. There are input signal level meters showing the input signal level on each input, signal level meter(s) for each output which indicate signal level relative to the limiter setting for each output, a thermal meter giving an impression of the temperature inside the amplifier, an amplifier status indicator showing when an amplifier is protecting itself from damage due to abnormal operating conditions, and Driver indicator(s) showing when the impedance of a driver is outside normal range. Generally, the indicators show green whilst all is well and red when something is wrong.

You may also mute the amplifier inputs using the mute buttons. You can change the view to the main panel by clicking the ">>" button.

5.4. User DSP

The amplifier can either use:

- **Factory settings determined entirely by the Factory preset file from your amplifier vendor (called “Factory voice”) – see Loading Factory Preset**
- **Your own setting (called “User Voice”) which overlay these basic factory settings**

A recessed Defeat button on the front of the amplifier allows you to select between Factory and User DSP settings. Click the button to toggle between these two modes. When the User DSP indicator is off, the amplifier is in Factory voice. In the Factory voice, you cannot change any of the settings; they are fixed by Tecnare (and thus are a safe ‘fallback’ if something goes wrong with your settings). Only when the indicator is on will changes you make in System Engineer be heard. Note however that if you make adjustments on the System Engineer control panel when the amplifier is set to Factory voice, the settings are changed and stored in the amplifier, but you will not be able to hear the changes until the button is set to User DSP. A red warning message will be shown on the system Engineer panel when in Factory voice.

An indicator at the top of the System Engineer panel to the right of the status indicators also shows the Voice setting of the amplifier (Voice 1 – User, or Voice 2 – Factory).

If you wish to make the amplifier entirely secure from tampering, you can disable the User DSP button by ticking the “Disable User Defeat Button” tickbox on the *Properties / Options* tab of the System Engineer control panel. This locks the amplifier into the User Voice regardless of the setting of the push button.

Also see “5.8. Loading Factory Preset” on Page 23 and Aux in Port.

5.5. Main control Panel

The Input area allows you to adjust the input sensitivity of each input of the amplifier, and to change the polarity of each input, allowing you to reverse the phase of the loudspeakers fed from that input.

The Output section allows you to control the output drive level of each amplifier. Also, depending on which parameters have been hidden by the vendor, you may also be able to:

- **Adjust the routing from inputs to outputs (allowing you for example to feed two outputs from one input). Regardless of hiding, you will always be able to see the routing in use**
- **Control Bridge mode (see Bridge Mode)**
- **Adjust the protection limiters (see Limiters).**

The EQ / Delay tab(s) allows you to adjust the equalisation, High-pass and Low-pass filters, and delays.

The equalisation allows you to adjust the frequency and Gain (**boost/cut**) for each of the equalisation filters, and the bandwidth of the parametric equalisers. The latter controls allow the responsiveness of the filters to be adjusted either as Octaves or Q, depending on the setting of *Preferences>Show Bandwidth As*. There is also a Low-shelf and a High-shelf filter, each with Frequency, Slope and Gain controls.

A ‘**Frequency Response**’ curve shows the shape of each filter individually (by colour), and the combined effect of all equalisation (in white).

The *Properties/Options* tab contains some properties of the amplifier. Here, you can enter a name for the amplifier (such as “**Left Fill**”). Also viewable in this tab are the model name of the amplifier, and the name of the settings provided by Tecnare of the factory file. The Maintenance area shows some details of how the amplifier has been used and the amount of protection the amplifier is applying.

The Logs area contains graphs of events against time, recording events over a period of up to three days. Since the amplifier cannot record any events whilst powered-off, breaks in a log due to power-downs are indicated by a break symbol [||] in the log. The events recorded are: Thermal, which is the used thermal capacity,

Protection, which is a measure of how much the amplifier is 'dimming' itself in order to protect itself from potential damage, and peak output current for each output. The data in the log can be exported by right-clicking on the log to launch a context menu, and selecting "copy log data to clipboard". The data could then be pasted into a spread-sheet for further analysis. Your dealer may ask you to do this if you have experienced a problem.

The Power button allows the amplifier to be put into power saving mode when it is not being used. The associated *Auto Power Save Time* control allows the amplifier to automatically go into power-save if no audio signal has been detected for a period of time. This function can be defeated by setting the latter control to Manual. We would strongly advise leaving it set to automatic however. There is no negative consequence to doing this since 'wake-up' on detecting the presence of an audio input signal is instantaneous.

You can change the view to the MonIcon panel by clicking the "<<" button.

5.6. Hidden Control

Tecnaire® may have hidden some of the controls on the panel in order to maintain proper protection of the connected loudspeakers. Such hidden controls will appear grey and cannot be adjusted.

5.7. Saving & Recalling Data

Device Data may be saved to disk or opened from disk. Sistem Enginner Device SEttings files (with file extension .dse) contain all the data necessary to restore a device to exactly the same state as when the file was saved.

If the current settings have been changed since the last file save or file open, the Save Icon on the panel toolbar will be shown in solid colour. If the settings are already safe, the Save icon appears grey.

If a file is opened when on-line to devices, the new data will be sent to the device, overwriting whatever was in the device. A warning will be given before this is done. Data saved from one device can be reopened in another to save time inputting data. (Assuming settings are to be duplicated)

System Engineer will always try to protect your data, warning you if you are attempting an action that could cause loss of data.

5.8. Loading Factory Preset

Tecnaire® may provide you with one or more 'preset library' files which contain settings for specific loudspeakers. These take the form of Factory files (Device FActory files (with file extension .dfa).

When you load preset factory settings into this type of device, the current user settings will be preserved since the factory settings will only overwrite the default factory DSP settings rather than the User DSP settings. However, routing (source selection), Limiter thresholds and Bridge mode become overwritten by the values in the factory file, even if the vendor has allowed you to edit these.

For further information on loading factory settings, please refer to the Sistem Engineer application main help.

5.9. Tool Bar

The toolbar provides the following one-click functions:

5.9.1. Open

Opens a file which contains parameters for the device. A dialogue will appear, inviting you to choose a file to open.

5.9.2. Save

Saves the current settings. A dialogue will appear inviting you to enter a file name. If the settings have not changed since you last saved or opened a file, the Icon will appear greyed out, indicating that a save is not necessary.

5.9.3. Locate

Flashes the Online indicator on the amplifier section to assist device identification, and as a quick check that communications are working. This only works when on-line.

5.9.4. Help

Launches Panel Help

5.9.5. Keyboard Shortcuts

System Enginner supports the following 'shortcuts':

Tab	Move to next control
-----	----------------------

In value boxes:

CTL+C	Copy
CTL+V	Paste
CTL+X	Cut
CTL+Z	Undo

On Drop-down, Spin, Push, Fader and radio controls:

PgUp	Increase value (coarsely)
PgDown	Reduce value (coarsely)
Up/Right arrow	Increase value (finely)
Down/Left arrow	Reduce value (finely)

On push-button controls:

Space	Activate
-------	----------

5.10. Audio Processing

The Digital Signal Processor (DSP) within the amplifier does all the necessary processing (such as crossover filtering, driver equalisation and power limiting) for the loudspeaker to give you a solution which operates well in most circumstances without the need for further user adjustment (apart from gain). The user may however apply further processing to optimise the amplifier for a given application.

The following user processing is available:

High-pass/Low-pass filtering with frequency variable over the range 20Hz to 25kHz (and 'Out') with the following alignments:

- 1st order
- 12dB/Octave Bessel
- 12dB/Octave Butterworth
- 12dB/Octave Linkwitz-Riley
- 18dB/Octave Bessel
- 18dB/Octave Butterworth
- 24dB/Octave Bessel
- 24dB/Octave Butterworth
- 24dB/Octave Linkwitz-Riley

A 2nd order low-shelf filter with frequency variable over the range 10Hz to 25kHz, and boost/cut from -15 to +15dB, and slope from 6 to 12dB/Octave.

A 2nd order high-shelf filter with frequency variable over the range 10Hz to 25kHz, and boost/cut from -15 to +15dB, and slope from 6 to 12dB/Octave.

Eight bands of parametric equaliser, each band having frequency variable over the range 10Hz to 25kHz, bandwidth variable from 0.18 to 5.6 octaves (Q 0.15 to 8.1), and boost/cut from -15 to +15dB.

Delay adjustable up to 90ms.

Adjustable input gain from -30 to +15dB, mute and polarity.

Adjustable output gain from -30 to +15dB.

5.11. Equalisation Filters

The eight Parametric equalisation filters may each be used to emphasise (by applying a positive Gain parameter setting) or de-emphasise (by applying a negative Gain parameter setting) a range of frequencies centered on the setting of the Frequency parameter, and encompassing a frequency range determined by the Bandwidth parameter setting.

The two shelving filters allow all frequencies below that of the frequency parameter (for the Low shelf) or all frequencies above that of the frequency parameter (for the high shelf) to be emphasised (by applying a positive Gain parameter setting) or de-emphasised (by applying a negative Gain parameter setting).

The ten filters are used in combination to achieve the desired response across all frequencies.

5.12. Bridge Mode

When the amplifier is set to Bridge Mode, it uses two amplifier channels to drive one loudspeaker with greater power. In this mode, there is only one set of Output controls per pair of amplifier channels since both of the amplifiers in the pair are driven with the same signals, as determined by the channel 1 (or channel 3) controls.

5.13. Protection

Comprehensive protection features preserve the longevity of the loudspeaker and amplifier by continuously monitoring several critical parameters, and reducing the gain, or muting the amplifier either temporarily or permanently depending on the nature and seriousness of the fault or misuse. The amplifier will recover and restart if at all possible, but may remain in shut down if a serious fault persists.

Limiters deal with routine over-driving of the amplifier, making sure that the driver(s) are not pushed too hard. The limiter indicator(s) will warn you when the driver is being driven into limit.

Minor faults are dealt with by 'dimming' the amplifier, reducing the level to a sufficient degree and for a sufficient time that the amplifier is able to recover gracefully without any user interaction. When the fault condition has passed, the amplifier will recover automatically.

More serious faults may cause the amplifier to mute while it recovers, after which it will automatically re-energise, again without user interaction. If such a fault is found to be persistent however, the amplifier is shut down permanently. A power cycle by the user is then required.

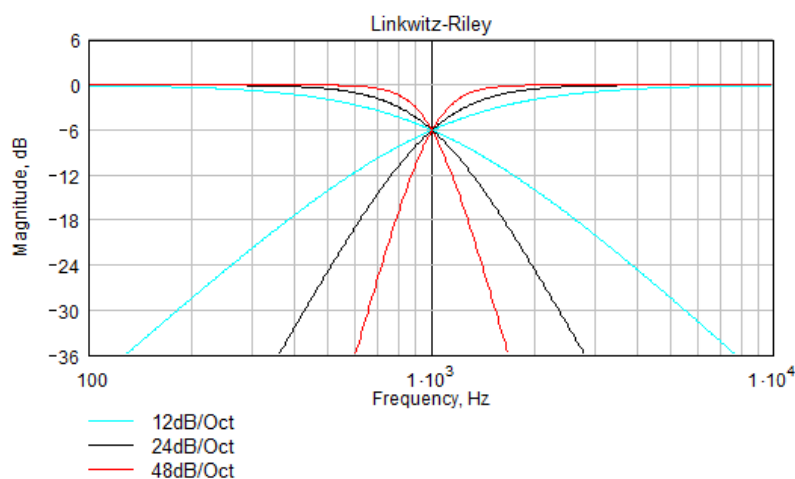
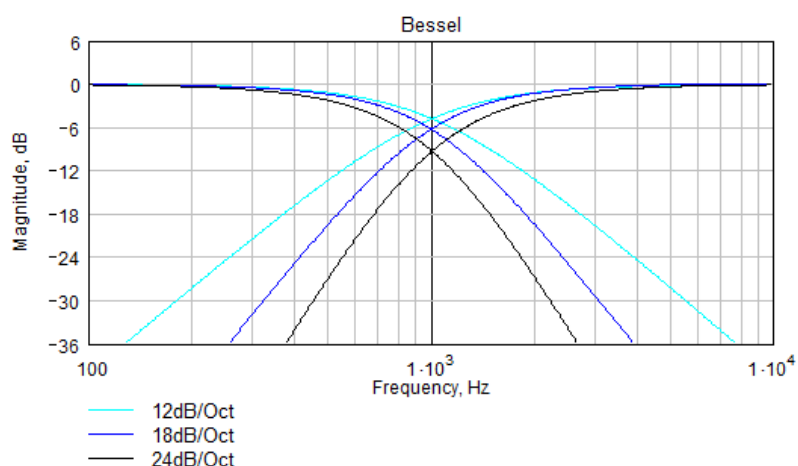
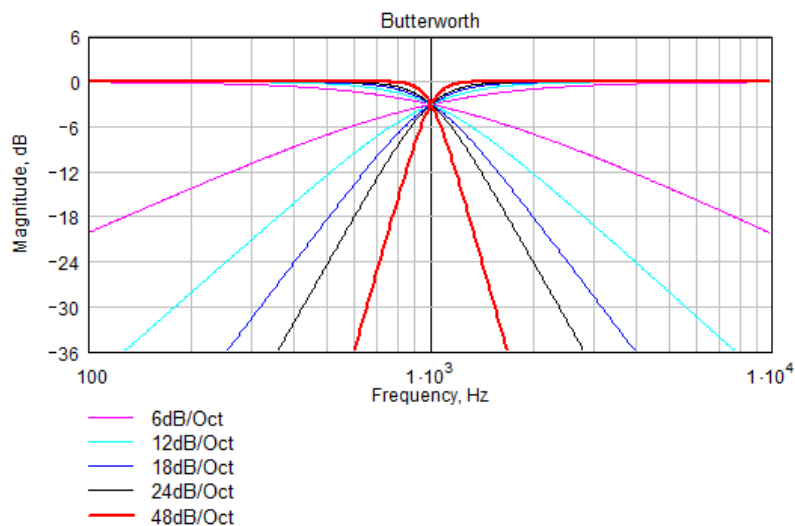
5.14. Limiters

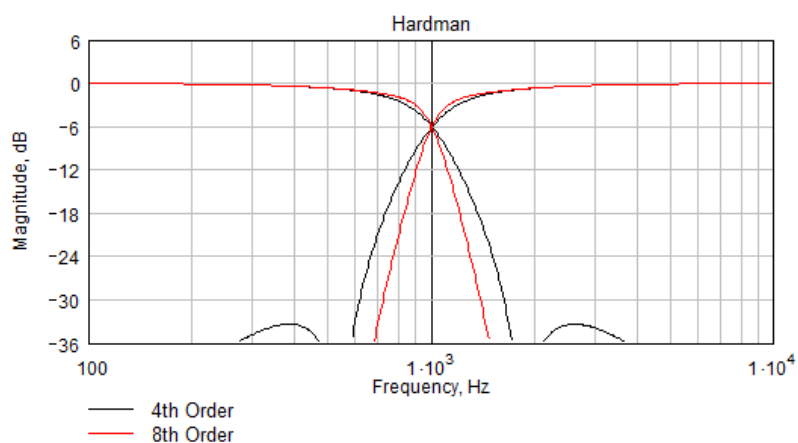
The Tecna® presets are protected against modification of the limitation settings to avoid improper adjustment of these, which could cause irreparable damage to both the device and the speakers that are connected to it.

In case of you need to apply your own setting, please refer to your vendor for advice on the appropriate settings to use. Note that a setting of 0dB on the limiters equates to $36.8\text{dBu} = 53.8\text{Vrms}$ (or 42.8dBu , 107.7Vrms in bridge mode). The equivalent RMS voltage at the output is also shown under the Threshold controls. For further help on the Sistem Engineer application, click the help button on the main application.

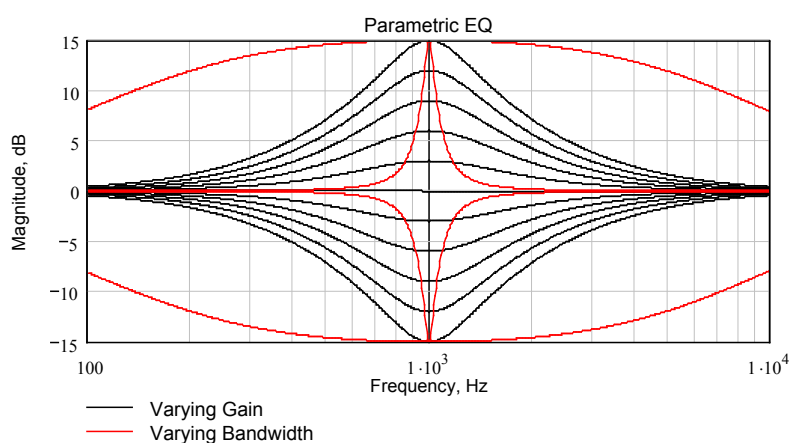
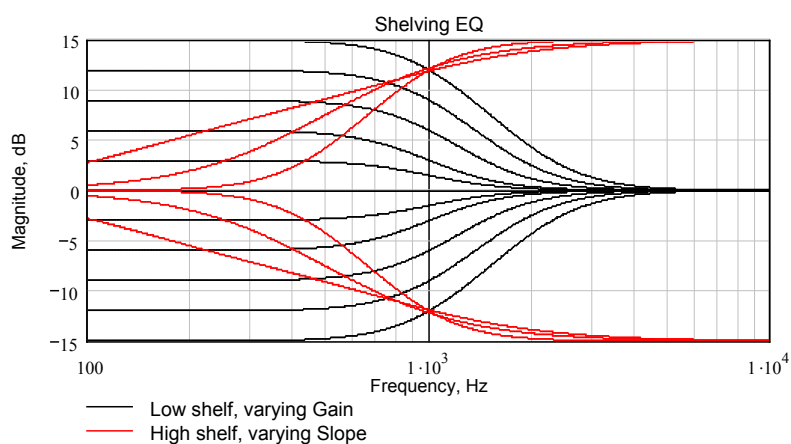
6. EQ and Filter Response Graphs

The following plots show the attenuation characteristics of the various crossover filters available within the XiT4. These are all shown at a crossover frequency of 1kHz.



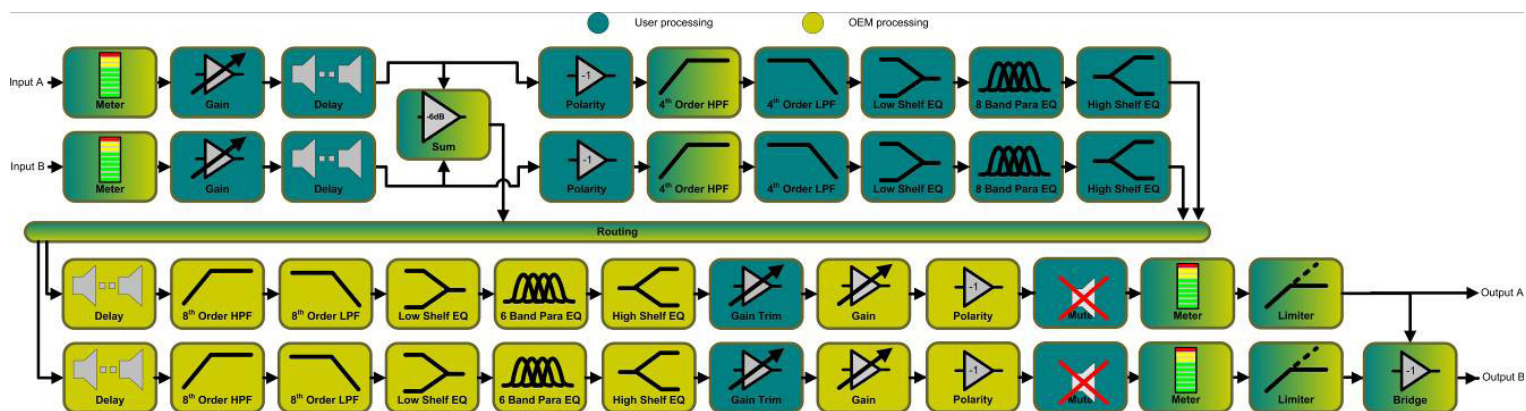


The following plots show the magnitude response (frequency response) characteristics of the various equalisation filters available within the XiT4. These are all shown at a c frequency of 1kHz.



7. Signal processing - Block Diagram

Please note that each XiT4 contains two of these processing blocks, one for each pair of channels



8. Technical Specifications

AUDIO

Input impedance	10k balanced
Max Input level	+20dBu
Frequency Response	20Hz - 20kHz+/-0.5dB @ 4 Ohm load
Output noise	-106dB A weighted Ref max output, 22kHz BW
Distortion	<0.05% (1kHz, -3dB output. 22kHz BW)

PROTECTION SYSTEMS

Output over current	Initially gain reduced to maintain control, extreme or persistent over current causes shutdown
Over temperature	limiters applied, persistent over temperature causes shutdown
Mains Brownout	Automatic protection & recovery
Switch on surge	Soft-start current inrush limiting
DC on output	Immediate shutdown, power cycle to recover

INDICATORS & CONTROLS

Indicators Per channel	Sig, Limit -6dB, Limit
Indicators Per channel pair	Power, Protect, Bridge, Network, User DSP active
Front panel controls:	
Per channel pair	User DSP Defeat - can be disabled with PodWare Power switch
Rear panel:	
Per channel pair	Contact closure inputs and Shutdown input (Aux)
Monitoring facilities	Input signal level, Output signal level Output current level Temperature Limiter operation Protection system operation Driver impedance

AMPLIFIERS

Type	High efficiency class D
Number of channels	Two / Four
Output power	(RMS program, 20Hz-20kHz all channels driven)
<i>per channel</i>	1,250W in to 2 Ohms 800W in to 4 Ohms 450W in to 8 Ohms
<i>per bridged pair</i>	2,500W in to 4 Ohms 1,600W in to 8 Ohms 900W in to 16 Ohms
Slew rate	>80V/us
Damping factor	120 ref 8 Ohms
Efficiency	>90% typical

POWER SUPPLIES

Type	High current, high freq. switch-mode
Number	One / Two, fully independent
Efficiency	>90% typical
Input voltage	115v / 230v nominal +/- 10%
Input voltage selection	Automatic
Mains frequency range	45 - 65Hz
Other features	Automatic soft-start Automatic brownout recovery Remote shutdown Automatic over voltage protection

THERMAL

One variable speed fan per pair of channels and additionally one variable speed fan per unit. Airflow is from the rear to the front.

ACCESSORIES

Airflow filtering kit
Rear rack support kit (TRSK-TS)

PHYSICAL

Height	2RU, 88mm
Width	19", 482mm (front panel) 16.8", 427mm (rear chassis)
Depth	14", 360mm (behind rack) 1.4", 35mm (forward of rack)
Weight	20 pounds, 9 Kgs
Operating temperature range	0 to +40°C
Relative humidity range	0 to 80% (non-condensing)

CONNECTIONS

Mains (per XiB4)	Neutrik 'PowerCON®'
Audio input (per channel)	3 pin female XLR
Audio link (per channel)	3 pin male XLR
Output (per channel)	Neutrik NL4 'SpeakON®'
USB	Type B (peripheral type)
Network (input & link)	2x RJ45 socket
Auxiliary (input & link)	2x RJ45 socket

REGULATORY COMPLIANCE

This product complies with the EMC & LVD directives as issued by the Commission of the European Community. Compliance with these directives implies conformity with the following European standards:

EN55103-1 Electromagnetic Interference (Emission)
EN55103-2 Electromagnetic Susceptibility (Immunity)
EN60065 Electrical safety
XiT4 also meets the requirements of FCC part 15B.

Reinventing The Rules



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XiT4 Operation manual

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Printed in Spain.

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