



ID48X
Matrix Signal Processor
User Manual
Revision 1.0

NST
AUDIO

www.nstaudio.com

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CONTENTS

EU Declaration of Conformity.....	3
Declaration of Conformity	4
Important Safety Instructions.....	5
Instructions De Securite Importantes.....	6
WEEE	7
ROHS.....	7
Thank You	8
Installation	8
Overview.....	9
Key Features	9
Unit Overview.....	10
D-Net Remote Control Application.....	12
Technical Specifications.....	13
Maintenance.....	14
Servicing.....	14
Warranty.....	14
Contact.....	14

EU DECLARATION OF CONFORMITY

This declaration is issued under the sole responsibility of the manufacturer.

We:

NST Audio Ltd
Units 1& 2 Long Row
Espersykes Farm
Malton
North Yorkshire
England
United Kingdom

Declare that this declaration of conformity is issued under our sole responsibility and belongs to the following product:

Kind of equipment: Audio processor
Model: ID48X

The object of the declaration is in conformity with the relevant Union harmonisation legislation:

2014/35/EU Low Voltage Directive (LVD)
2014/30/EU Electromagnetic Compatibility Directive (EMC)

The following harmonised standard and technical specifications have been applied:

EN 62368-1:2014 - Audio/video, information and communication technology equipment - Safety requirements
EN 55032:2015 - Electromagnetic compatibility of multimedia equipment - Emission requirements
EN 55035:2017 - Electromagnetic compatibility of multimedia equipment - Immunity requirements

Signed:



Name: Dan Cartman

Position: Research and Development Manager

Date: December 2021



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Kind of equipment: Audio processor
Model: ID48X

The object of the declaration is in conformity with the relevant statutory requirements:

2016 No. 1101 - Electrical Equipment (Safety) Regulations 2016
2016 No. 1091 - Electromagnetic Compatibility Regulations 2016

The following UK designated standards and technical specifications have been applied:

BS EN 62368-1:2014 - Audio/video, information and communication technology equipment - Safety requirements
BS EN 55032:2015 - Electromagnetic compatibility of multimedia equipment - Emission requirements
BS EN 55035:2017 - Electromagnetic compatibility of multimedia equipment - Immunity requirements

Signed:



Name: Dan Cartman

Position: Research and Development Manager

Date: December 2021

**UK
CA**

IMPORTANT SAFETY INSTRUCTIONS

CAUTION: RISK OF ELECTRIC SHOCK. DO NOT OPEN.



The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARNING: Apparatus with CLASS I construction shall be connected to a MAINS socket outlet with a protective earthing connection.

WARNING: To prevent injury, this apparatus must be securely attached to the rack in accordance with the installation instructions.

- 1 : Read these instructions.
- 2 : Keep these instructions.
- 3 : Heed all warnings.
- 4 : Follow all instructions.
- 5 : Do not use this apparatus near water.
- 6 : Clean only with a dry cloth.
- 7 : Do not block any ventilation openings, install in accordance with the manufacturer's instructions.
- 8 : Do not install near any heat sources, such as radiators, heat registers, stoves or other apparatus (including amplifiers) that produce heat.
- 9 : Do not defeat the safety purpose of the polarised or grounding-type plug. A polarised plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- 10 : Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles and the point where they exit from the apparatus.
- 11 : Only use attachments/accessories specified by the manufacturer.
- 12 : Use only with the cart, tripod, bracket or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from a tip over.
- 13 : Unplug this apparatus during lightning storms or when unused for a long period of time.
- 14 : Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as if the power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
- 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 : To completely disconnect this equipment from the AC mains, disconnect the power cord from the mains circuit breaker.
- 17 : This unit is fitted with a 3-wire power cord. For safety reasons, THE EARTH LEAD SHOULD NOT BE DISCONNECTED IN ANY CIRCUMSTANCE.
- 18 : Only replace the IEC inlet fuse with the correct part: T 3.15A H 250V.

INSTRUCTIONS DE SECURITE IMPORTANTES

ATTENTION: RISQUE DE CHOC ELECTRIQUE. NE PAS OUVRIR.



Le symbole représentant un éclair fléché dans un triangle équilatéral a pour but d'alerter l'utilisateur de la présence d'une "tension dangereuse" non isolée à l'intérieur du boîtier, pouvant être d'une force suffisante pour constituer un risque d'électrocution.



Le point d'exclamation dans un triangle équilatéral a pour but d'alerter l'utilisateur de la présence d'instructions importantes concernant le fonctionnement et la maintenance, dans la documentation qui accompagne l'appareil.

ATTENTION: Appareils de construction de CLASSE I doit être raccordé au réseau électrique via une prise de courant reliée à la terre.

ATTENTION: Pour éviter toute blessure, cet appareil doit être solidement fixé à la torture, conformément aux instructions d'installation.

- 1 : Lisez ces consignes.
- 2 : Conservez ces consignes.
- 3 : Respectez tous les avertissements.
- 4 : Respectez toutes les consignes d'utilisation.
- 5 : N'utilisez jamais l'appareil à proximité d'un liquide.
- 6 : Nettoyez l'appareil avec un chiffon sec.
- 7 : Veillez à ne pas empêcher la bonne ventilation de l'appareil via ses outils de ventilation. Respectez les consignes du fabricant concernant l'installation de l'appareil.
- 8 : Ne placez pas l'appareil à proximité d'une source de chaleur telle qu'un chauffage, une cuisinière ou tout appareil dégageant de la chaleur (y compris un ampli de puissance).
- 9 : Ne supprimez jamais la sécurité des prises bipolaires ou des prises terre. Les prises bipolaires possèdent deux contacts de largeur différente. Le plus large est le contact de sécurité. Les prises terre possèdent deux contacts plus une mise à la terre servant de sécurité. L'alimentation fournie ne correspond pas à celles de votre installation électrique, faites appel à un électricien pour effectuer le changement de prise.
- 10 : Installez le cordon d'alimentation de telle façon que personne ne puisse marcher dessus et qu'il soit protégé d'arêtes coupantes. Assurez-vous que le cordon d'alimentation est suffisamment protégé, notamment au niveau de sa prise électrique et de l'endroit où il est relié à l'appareil; cela est également valable pour une éventuelle rallonge électrique.
- 11 : Utilisez exclusivement des accessoires et des appareils supplémentaires recommandés par le fabricant.
- 12 : Utilisez exclusivement des chariots, des diables, des présentoirs, des pieds et des surfaces de travail recommandés par le fabricant ou livrés avec le produit. Déplacez précautionneusement tout chariot ou diable chargé pour éviter d'éventuelles blessures en cas de chute.
- 13 : Débranchez l'appareil de la tension secteur en cas d'orage ou si l'appareil reste inutilisé pendant une longue période de temps.
- 14 : Les travaux d'entretien de l'appareil doivent être effectués uniquement par du personnel qualifié. Aucun entretien n'est nécessaire sauf si l'appareil est endommagé de quelque façon que ce soit (dommages sur le cordon d'alimentation ou la prise par exemple), si un liquide ou un objet a pénétré à l'intérieur du châssis, si l'appareil a été exposé à la pluie ou à l'humidité, s'il ne fonctionne pas correctement ou à la suite d'une chute.
- 15 : N'exposez pas cet équipement au fait de tomber goutte à goutte ou au fait d'éclabousser et gardez qu'aucun objet rempli de liquides, comme les vases, n'est placé sur l'équipement.
- 16 : Pour complètement débrancher cet équipement de la conduite principale de courant alternatif, débranchez la corde de pouvoir du disjoncteur de conduite principale.
- 17 : Cette unité est correspondue avec une corde de pouvoir de 3 fils. Pour les raisons de sécurité, L'AVANCE DE TERRE NE DEVRAIT ETRE DÉBRANCHÉE DANS AUCUNE CIRCONSTANCE.
- 18 : Ne remplacez le fusible d'entrée IEC que par la pièce correcte: T 3.15A H 250V.

WEEE



Once your NST Audio product has reached the end of its useful life, please ensure that it is recycled in a proper manner.

"The WEEE Regulations 2013 are the UK interpretation of the EU WEEE Directive and aim to reduce the quantity of waste electrical and electronic equipment (WEEE) disposed of in the UK".

EEE producers are required to pay for the reuse, recycling and recovery of the products by registering as an EEE producer which requires them to join a producer compliance scheme.

NST Audio has been registered with producer compliance scheme Comply Direct since 2015 ensuring 100% compliance with the WEEE regulations 2013.

Our WEEE Producer Registration Number is WEE/HG5453ZY.

Old electrical equipment can be recycled along with its metal enclosure. Our products are marked with a crossed-out wheeled bin symbol on the rear of the product.

Please do not throw any electrical equipment (including those marked with the crossed out wheeled bin symbol) in your general waste bin.

NST Audio Ltd. is able to arrange WEEE collections for our customers through a trusted network of WEEE recycling facilities made available by Comply Direct. We are able to arrange collection and transportation of your WEEE to reprocess and recycle ensuring the minimum goes to landfill.

ROHS

The Restriction of Hazardous Substances in Electrical and Electronic Equipment (RoHS) Directive (2011/65/EU).

NST Audio Ltd products are RoHS compliant, and are available for export as lead-free and RoHS compliant.

NST Audio Ltd is committed to eliminating the use of hazardous substances in the materials, manufacturing and packaging of our products in strict accordance with the RoHS directive.

With regards to the RoHS Directive 2002 / 95 / EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment, we declare that to the best of our knowledge, all products meet and fulfil all the requirements of the aforementioned directive.

THANK YOU

Thank you for choosing an NST Audio product for your application. Please spend a little time reading through this manual, so that you can obtain the best possible performance from the unit.

All NST products are carefully designed and engineered for cutting-edge performance and world-class reliability. If you would like further information about this, or any other NST product, please do not hesitate to contact us.

UNPACKING THE UNIT

After unpacking, please check the unit carefully for any damage. If any is found, immediately notify the carrier concerned - you, the consignee, must instigate any claim.

Please retain all packaging, in case of future re-shipment.

INSTALLATION

Electrical Considerations:

The NST device has been manufactured to comply with your local power supply requirements, but before connecting the unit to the supply, ensure that the voltage (printed on the rear panel) is correct, and that a mains fuse of the correct type and rating has been fitted.

Make sure power outlets conform to the power requirements listed on the back of the unit.

Damage caused by connecting to incorrect AC voltage is not covered by the warranty.

Mechanical Considerations:

To ensure that this equipment performs to specification, it should be mounted in a suitable rack or enclosure. When mounting the unit in a rack or enclosure, ensure that there is adequate ventilation. The cooling fan sucks cool air in through the right side and blows warm air out of the left side of the unit through the ventilating grills. Take care when mounting other equipment in the same rack.

Operation:

Read all documentation before operating your equipment and retain all documentation for future reference. Do not spill water or other liquids into or on the unit and do not operate the unit while standing in liquid. Do not block the fan intake or operate the unit in an environment that could impede the free flow of air around the unit. If the unit is used in an extremely dusty or smoky environment, it should be cleaned of any collected debris at regular intervals.

OVERVIEW

With inputs and outputs switchable in channel pairs between analogue or AES/EBU the ID48X gives you the flexibility you need to integrate into your system.

Compressors are available on every input as well as a high pass filter, 8 bands of parametric EQ, 3 bands of dynamic EQ, a 28-band graphic EQ, and up to 1.3 seconds of delay. Routing to outputs can be configured to either mix-matrix mode, free-routing or several pre-configured routing options.

Flexible channel linking enables quick and easy configuration of common crossover setups or customised configurations as required. Every output channel has high and low pass filters, 16 bands of parametric EQ, up to 1.3 seconds of delay as well as a new limiter designed to offer the best driver protection with the lowest distortion.

The ID48X runs at a fixed sampling rate of 96kHz. Front panel meters show levels of all inputs and outputs (plus mute states) and indication of remote control status is also provided.

The USB and Ethernet based computer control software gives you the ability to not only control all the devices on a network but also to store preset memories and configure systems offline. With Mac and iPad control too, you can control your system the way that suits you.

KEY FEATURES

4 Analogue Inputs, 8 Analogue Outputs

AES Digital Inputs and Outputs with sample rate conversion from 24kHz to 192kHz

Sample rate fixed at 96kHz.

Input Processing Features:

Soft Knee Compressor

8 Parametric EQs

24dB/Oct HPF

3 bands of Dynamic EQ

28-band Graphic EQ

Gain, Polarity, Delay

Routing Matrix Modes:

Mix Matrix, Routing Matrix, Preset Configurations (2x4, 4x2, 1x8, 2x3+2)

Output Processing Features:

16 Parametric EQs

Crossover Filters up to 48dB/Oct

FIR Filter capable -

1024 Taps/2ch, 512 Taps/4ch, 256 Taps/8ch at 96kHz

Gain, Polarity, Delay, Limiter

Control Features:

Remote control via Gbps/100Mbps Ethernet, USB Type C

Up to 30 presets may be stored for offline recall

Front Panel Overview:



1. Input Meters:

Real time LED input meters show level from maximum input level (clip) in 4-segments...

Signal present, 6dB below clipping, 0dB/maximum input level and clip.

If analogue input level is within 1dB of clipping, the red input Clip LED will illuminate to show this.

2. Output Meters, with Mute Indication:

Real time LED output meters show level from the limiter threshold in 4-segments...

Signal present, 6dB below limiter threshold, Limiter threshold and 3dB into limiting.

Note: The red limiter +3 LED will also illuminate if this output is muted.

3. Comms LEDs:

Flashes when communication is taking place between the device and D-Net software on either Ethernet port (green for 1Gbps or orange for 100Mbps) or via the USB port (green).

4. Power LED:

Illuminates when a suitable power source is connected and the unit is powered on.

5. USB Port:

USB type C port for single unit connection to a computer running the D-Net software. This will also allow remote control of other NST devices if they are connected via the Ethernet ports on the rear panel.

Rear Panel Overview:



1. Mains Power Inlet, Fuse and Power Switch:

3-pin IEC input, fused [5mm x 20mm, 3.15A, 250V, Anti-Surge (T)], 90-250VAC, 50-60Hz <40W.

A spare fuse is located within the fuse holder – only replace with the correctly rated fuse!

2. Ethernet Computer Control Ports:

Neutrik EtherCON RJ45 network Ethernet ports accepts either a standard CAT5 cable or housed RJ45 connector for connection to a computer. Connect to port 1 and daisy chain from port 2 to additional NST units or use a suitable network switch to control multiple units simultaneously.

3. Balanced Analogue Audio Outputs / Digital AES Outputs*:

The analogue outputs are wired as follows:

Pin 1: Shield/Ground

Pin 2: Signal Hot (+)

Pin 3: Signal Cold (-)

*Digital AES outputs can be enabled from within the D-Net software, and run in pairs...

Outputs 1 and 2 are outputted together from output 1.

Outputs 3 and 4 are outputted together from output 3.

Outputs 5 and 6 are outputted together from output 5.

Outputs 7 and 8 are outputted together from output 7.

4. Balanced Analogue Audio Inputs / Digital AES Inputs*:

The analogue inputs are wired as follows:

Pin 1: Shield/Ground

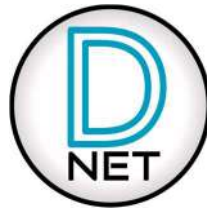
Pin 2: Signal Hot (+)

Pin 3: Signal Cold (-)

*Digital AES inputs can be enabled from within the D-Net software, and run in pairs...

Inputs A and B are inputted together on input A.

Inputs C and D are inputted together on input C.



D-Net is an Ethernet based computer control platform that gives you the ability to not only control all the devices on a network, but also to store presets and configure systems offline.

Compatibility with Microsoft Windows, Apple Mac and Apple iPad too, you can control your system the way that suits you. USB connection (Microsoft Windows only) is also available on some devices, allowing quick connection to a single device.

D-Net is available to download, free of charge, from the NST Audio website:



nstudio.com/software-downloads



The iPad version is available from the Apple app store. (There is also a link to this from the software page shown above).



Analogue Inputs – 4

Electronically balanced, pin 2 hot
CMRR: >60dB @ 1kHz
Maximum Level: >20dBu
Input Impedance: 10k Ω balanced

AES Inputs – 2 x 2 channel

Transformer balanced, pin 2 hot
AES Input Sample Rates : 8kHz to 192kHz
AES Input s/n Ratio : 139dB
Input Impedance : 110 Ω

Analogue Outputs – 8

Electronically balanced, pin 2 hot
Maximum Level: >20dBu
Source Impedance: <60 Ω

AES Outputs – 4 x 2 channel

Transformer balanced, pin 2 hot
Sample Rate : 96kHz
Source Impedance : 110 Ω

Performance:

Frequency Response 12Hz – 32kHz \pm 0.2dB
Dynamic Range: >119dB 'A' weighted (in to out analogue)
THD + N (+19dB @ 1kHz): 0.00029%
Latency: 0.427ms (in to out, analogue, 96kHz)

Processing:

Input Gain (per channel) : -30 to +15dB in 0.1dB steps, mute, phase
Input Delay (per channel) : 0 to 1.3s in 10.4 μ S steps (at 96kHz)
Input Compressor (per channel) : Threshold (-30 to +22 dBu), Attack, Release, Ratio, Soft-Knee
Input Parametric EQ (per channel) : 8 bands – parametric, low shelf, high shelf, notch, band-pass
Input High-Pass Filter (per channel) : Up to 24dB/octave (Bensen/Butterworth/Bessel/Linkwitz-Riley)
Input Dynamic EQ (per channel) : 3 bands
Input Graphic EQ (per channel) : 28 bands

Routing Inputs to Outputs: Choice of modes (Matrix Mixer, Free Routing, 1 \times 8, 2 \times 4, 4 \times 2, 2 \times 3+2 Aux)

Output Parametric EQ (per channel) : 16 bands – parametric, low shelf, high shelf, notch, band-pass
Output High-Pass and Low-Pass Filter (per channel) : Up to 48dB/octave (Bensen/Butterworth/Bessel/Linkwitz-Riley)
FIR Filter capable - 1024 Taps/2ch, 512 Taps/4ch, 256 Taps/8ch at 96kHz
Output Gain (per channel) : -30 to +15dB in 0.1dB steps, mute, phase
Output Delay (per channel) : 0 to 1.3s in 10.4 μ S steps (at 96kHz)
Output Limiter (per channel) : Threshold (-50 to +22dBu), attack, release, auto attack/release option

Presets : Up to 30

Power Requirements:

3-pin IEC input, fused [5mm x 20mm, 3.15A, 250V, Anti-Surge (T)], 90-250VAC, 50-60Hz 20W

Dimensions:

Height: 44mm (1.75inch) 1U, Depth: 213mm (8.4 inches), Width: 482mm (19 inches)

Weight:

Net: 2.5kg, Shipping: 3.5kg

MAINTENANCE

The unit will require very little routine maintenance, apart from occasional routine checking of the fan inlet outlets on the side panels. Cleaning the casework should only be done with a cloth lightly dampened with water only! The use of chemical or abrasive cleaners may damage the paint finish.

SERVICING

There are no user serviceable parts within the unit!
Please contact us to arrange returning any units to us that require servicing or repairing.

WARRANTY

This product comes with a warranty against defects in components and workmanship only, for a period of five years from the date of shipment to the customer. During the warranty period, NST Audio will, at its discretion, either repair or replace products that prove to be defective, provided that the product is returned, shipping prepaid, to an authorised NST Audio service facility.

Defects caused by unauthorised modifications, misuse, negligence, act of God or accident, or any use of this product that is not in accordance with the instructions provided by NST Audio, are not covered by this warranty.

This warranty is exclusive and no other warranty is expressed or implied.
NST Audio is not liable for consequential damages.

CONTACT

If you have any questions or comments about the information contained within this manual, or require further assistance, then please do not hesitate to contact us:



www.nstaudio.com



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Thank you!

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The NST Audio team