



AUDAC NIO2xx Network Module Owner's Manual

[Home](#) » [AUDAC](#) » AUDAC NIO2xx Network Module Owner's Manual 

Contents

- [1 AUDAC NIO2xx Network Module](#)
- [2 Product Usage Instructions](#)
- [3 FAQ](#)
- [4 Introduction](#)
- [5 Precautions](#)
- [6 Connections](#)
- [7 Overview front panel](#)
- [8 Front panel description](#)
- [9 Factory Reset](#)
- [10 Technical Specifications](#)
- [11 Documents / Resources](#)
 - [11.1 References](#)



AUDAC NIO2xx Network Module



Product Usage Instructions

- Connect the NIO2xx to audio input and output devices using the terminal block connectors.
- Ensure proper network settings are configured for seamless communication.
- The front panel provides access to essential controls and indicators while the rear panel offers additional connectivity options.
- Install antennas and contacts as instructed for optimal performance.
- Refer to the quick start guide for initial setup and configuration.
- Use the AUDAC Touch™ interface to configure DSP functions and device settings.

FAQ

- **Q:** How do I switch between line-level and microphone-level audio signals?
- **A:** Use the appropriate settings in the AUDAC Touch™ interface to switch between line-level and microphone-level inputs.
- **Q:** Is the NIO2xx compatible with PoE networks?
- **A:** Yes, the NIO2xx is compatible with PoE network-based installations due to its low power consumption.

ADDITIONAL INFORMATION

- This manual is put together with much care and is as complete as could be on the publication date.
- However, updates on the specifications, functionality or software may have occurred since publication.
- To obtain the latest version of both manual and software, please visit the Audac website@audac.eu.



Introduction

Networked I/O expander Dante™/AES67

- NIO series are Dante™/AES67 networked I/O expanders featuring terminal block input and output audio connection and Bluetooth connection. The audio inputs can be switched between line-level and microphone-level audio signals and phantom power (+48 V DC) can be applied to the input connectors for powering condenser microphones. Various further integrated DSP functions such as EQ, automatic gain control, and other device settings can be configured through the AUDAC Touch™.
- The IP-based communication makes it future-proof while also being backward compatible with many existing products. Thanks to the limited PoE power consumption, the NIO series is compatible with any PoE network-based installation.
- The networked I/O expanders are compatible with MBS1xx setup box installation accessories which allow them to be mounted under a desk, in a closet, on the wall, on top of a dropped ceiling or on a 19" equipment rack.

Precautions

READ THE FOLLOWING INSTRUCTIONS FOR YOUR OWN SAFETY

- ALWAYS KEEP THESE INSTRUCTIONS. NEVER THROW THEM AWAY
- ALWAYS HANDLE THIS UNIT WITH CARE
- HEED ALL WARNINGS
- FOLLOW ALL INSTRUCTIONS
- NEVER EXPOSE THIS EQUIPMENT TO RAIN, MOISTURE, ANY DRIPPING OR SPLASHING LIQUID. AND NEVER PLACE AN OBJECT FILLED WITH LIQUID ON TOP OF THIS DEVICE
- NO NAKED FLAME SOURCES, SUCH AS LIGHTED CANDLES, SHOULD BE PLACED ON THE APPARATUS
- DO NOT PLACE THIS UNIT IN AN ENCLOSED ENVIRONMENT SUCH AS A BOOKSHELF OR CLOSET. ENSURE THERE IS ADEQUATE VENTILATION TO COOL THE UNIT. DO NOT BLOCK THE VENTILATION OPENINGS.
- DO NOT INSTALL THIS UNIT NEAR ANY HEAT SOURCES SUCH AS RADIATORS OR OTHER APPARATUS THAT PRODUCE HEAT
- DO NOT PLACE THIS UNIT IN ENVIRONMENTS WHICH CONTAIN HIGH LEVELS OF DUST, HEAT, MOISTURE OR VIBRATION THIS UNIT IS DEVELOPED FOR INDOOR USE ONLY. DO NOT USE IT OUTDOORS
- PLACE THE UNIT ON A STABLE BASE OR MOUNT IT IN A STABLE RACK
- ONLY USE ATTACHMENTS & ACCESSORIES SPECIFIED BY THE MANUFACTURER
- UNPLUG THIS APPARATUS DURING LIGHTNING STORMS OR WHEN UNUSED FOR LONG PERIODS OF

TIME

- ONLY CONNECT THIS UNIT TO A MAINS SOCKET OUTLET WITH A PROTECTIVE EARTHING CONNECTION
- USE THE APPARATUS ONLY IN MODERATE CLIMATES

CAUTION – SERVICING



- This product contains no user-serviceable parts. Refer all servicing to qualified service personnel. Do not perform any servicing (unless you are qualified to)

EC DECLARATION OF CONFORMITY



- This product conforms to all the essential requirements and further relevant specifications described in the following directives: 2014/30/EU (EMC), 2014/35/EU (LVD) & 2014/53/EU (RED).

WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT (WEEE)



- The WEEE marking indicates that this product should not be disposed of with regular household waste at the end of its life cycle. This regulation is created to prevent any possible harm to the environment or human health.
- This product is developed and manufactured with high-quality materials and components that can be recycled and/or reused. Please dispose of this product at your local collection point or recycling center for electrical and electronic waste. This will make sure that it will be recycled in an environmentally friendly manner, and will help to protect the environment in which we all live.

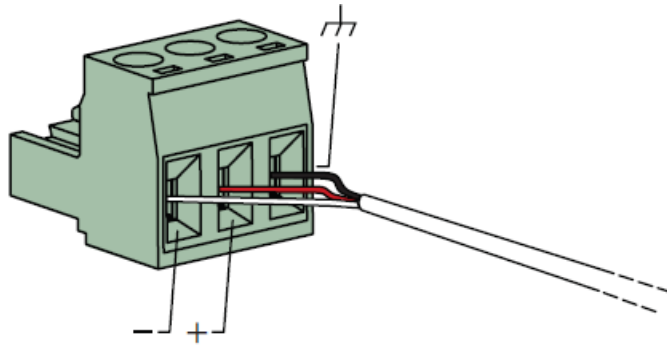
Connections

CONNECTION STANDARDS

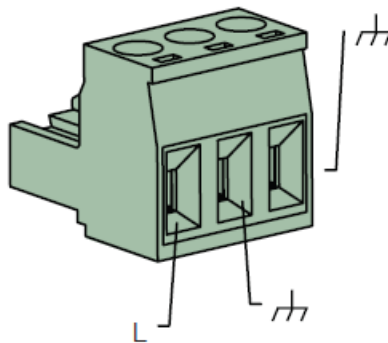
- The in- and output connections for AUDAC audio equipment are performed according to international wiring standards for professional audio equipment.

3-Pin Terminal block

- For balanced line output connections.



- For unbalanced line input connections.



RJ45 (Network, PoE)

connections



- Pin 1 White-Orange
- Pin 2 Orange
- Pin 3 White-Green
- Pin 4 Blue
- Pin 5 White-Blue
- Pin 6 Green
- Pin 7 White-Brown
- Pin 8 Brown

Ethernet (PoE)

- Used for connecting the NIO series in your Ethernet network with PoE (Power over Ethernet). The NIO series complies with the IEEE 802.3 af/at standard, which allows IP-based terminals to receive power, in parallel to data, over the existing CAT-5 Ethernet infrastructure without the need to make any modifications in it.
- PoE integrates data and power on the same wires, it keeps the structured cabling safe and does not interfere with concurrent network operation. PoE delivers 48v of DC power over unshielded twisted-pair wiring for terminals consuming less than 13 watts of power.
- The maximum output power depends on the power delivered by the network infrastructure. In case the network infrastructure is not capable of delivering sufficient power, use a PoE injector to the NIO series.
- While CAT5E network cable infrastructure is sufficient for handling the required bandwidth, it is recommended to upgrade the network cabling to CAT6A or better cabling to achieve the best possible thermal and power efficiency throughout the system when drawing higher powers over PoE.

Network settings

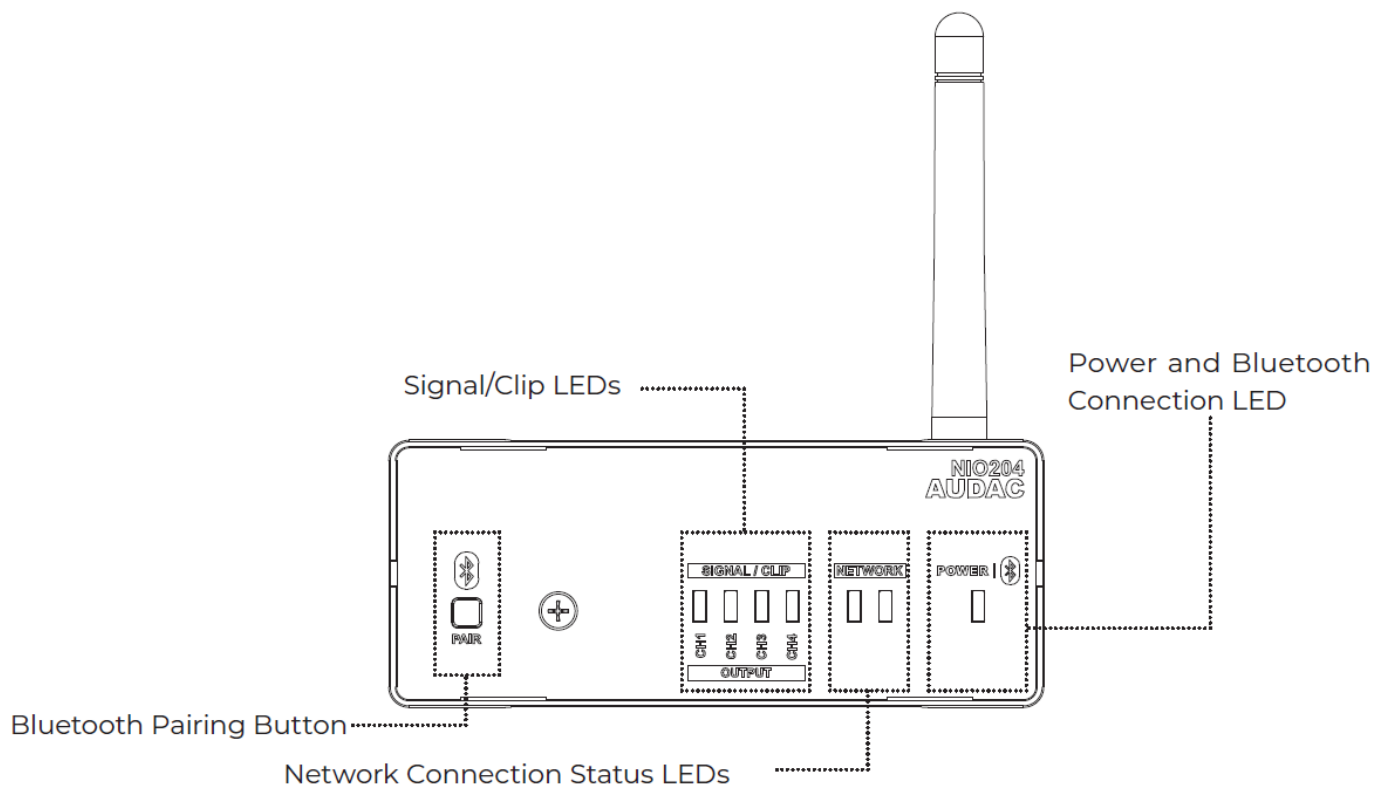
STANDARD NETWORK SETTINGS

DHCP: ON

- IP Address: Depending on DHCP
- Subnet Mask: 255.255.255.0 (Depending on DHCP)
- Gateway: 192.168.0.253 (Depending on DHCP)
- DNS 1: 8.8.4.4 (Depending on DHCP)
- DNS 2: 8.8.8.8 (Depending on DHCP)

Overview front panel

The NIO2xx series comes in a compact convection-cooled enclosure. The front panel of each NIO2xx series product has a power and Bluetooth connection LED, network connection status LEDs, Bluetooth pairing button and signal/clip indicator LEDs. Signal/clip LEDs can be for input, output or both based on the model.



Front panel description

Power and Bluetooth Connection LED

- The LED turns green when the device is powered, flashes in blue when the device is in Bluetooth discovery mode and turns blue when Bluetooth is paired.
- If no pairing occurs while the LED is flashing, the LED turns back to green after 60 seconds.

Network Connection Status LEDs

- The network LEDs are the status indicator for network activity and speed, the same as the ethernet port on the rear panel of the device.
- Activity link LED (Act.) should be green for a successful link whereas the speed LED (Link) should be orange for indication of a 1Gbps connection.

Signal/Clip LEDs

- Signal/clip LEDs are indicators for signal presence and clipping warning on the input or output of the device.
- NIO204 has signal/clip LEDs for its output four channels.
- NIO240 has signal/clip LEDs for its input four channels.
- NIO222 has signal/clip LEDs for its two input and two output channels.

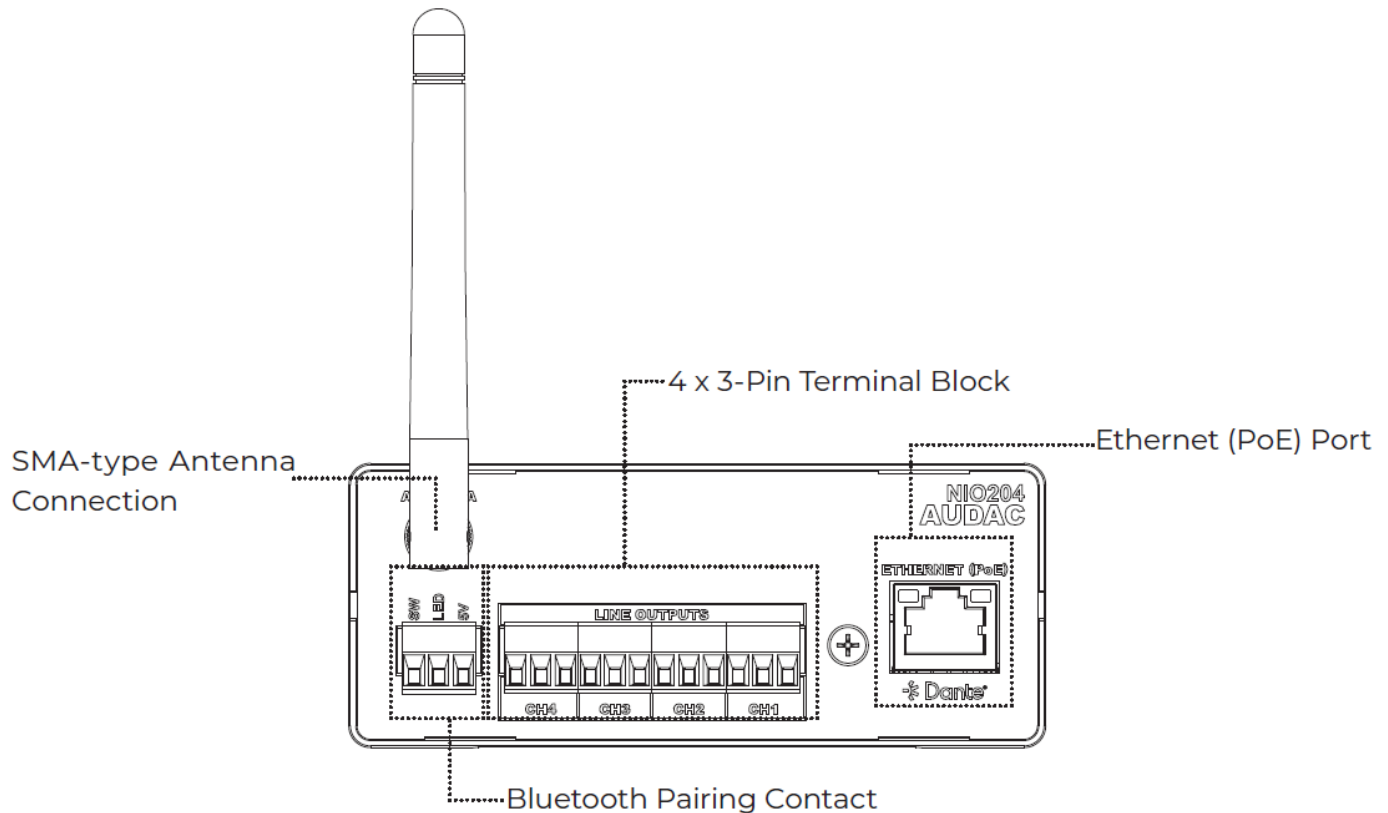
Bluetooth Pairing Button

- The NIO2xx series has Bluetooth, and pairing can be enabled in various ways.
- One of them is the pairing button on the front panel.
- Pressing the Pair button for 5 seconds activates Bluetooth pairing, and the power LED blinks in blue.

- After the connection is established, the power LED will turn solid blue.

Overview rear panel

The rear of the NIO2xx series contains audio input and output 3-pin terminal block connections, an ethernet connection port which is used to connect the expanders to the RJ45 connector, 3-pin terminal block bluetooth pair contact and bluetooth antenna. As the NIO2xx series are Dante™/AES67 networked audio-in & output expanders with PoE, all data flow and powering are done through this single port.



Ethernet (PoE) Port

- The Ethernet connection is the essential connection for the NIO2xx series. Both audio transmission (Dante/AES67), as well as control signals and power (PoE), are distributed over the Ethernet network.
- This input shall be connected to your network infrastructure. The LEDs accompanied by this input indicate the network activity.

3-Pin Terminal Block

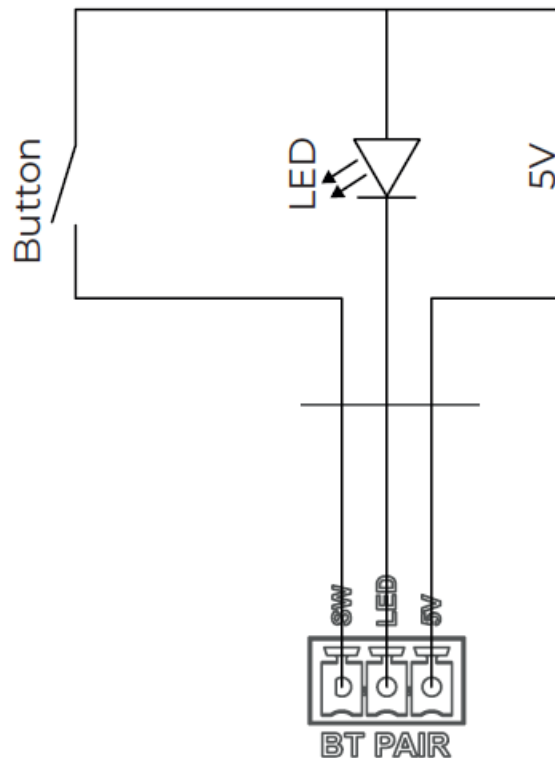
- The NIO2xx series has 4 sets of 3-pin terminal blocks on the rear panel.
- NIO204 has 4 channel balanced line output terminals.
- NIO240 has 4 channel line/mic input terminals.
- NIO222 has 2 channel mic/line terminals and 2 channel balanced line output terminals.

SMA-type Antenna Connection

The antenna (input) connection is implemented using an SMA-type (male) connector where the supplied antenna should get connected. Depending of the installation conditions (e.g. when installed in a closed/shielded cabinet), it can be extended using optionally available accessories for optimal reception conditions.

Bluetooth Pairing Contact

- When the NIO2xxx is installed in something like a locked rack, it may be difficult to enable Bluetooth pairing for new devices using the front button. For this purpose, an external pairing connector can be connected that contains the combination LED and button. When the button is pressed, Bluetooth pairing is enabled. This is confirmed by the flashing of the LED.
- If a device is connected, the connection is broken.
- The LED will flicker for 60 seconds and the NIO2xx is visible to make a (new) connection. If a device connects, the LED will remain lit. After 60 seconds without connection, the NIO2xx is no longer visible to new devices but old devices can still connect. After 60 seconds the LED will be off.
- The connection can be made according to this wiring diagram:



Quick start guide

- This chapter guides you through the setup process for a NIO2xx series networked I/O expander where the expander is a Dante™/AES67 source connected to the network. The control of the system is done through Audac Touch™.
- The NIO2xx are compatible with MBS1xx setup box installation accessories which allow them to be mounted under a desk, in a closet, on the wall, on top of a dropped ceiling, or in a 19" equipment rack.

Connecting the NIO2xx series

1. Connecting the NIO2xx series networked I/O expanders to your network

In order to power your NIO2xx series networked I/O expander, connect your expander to a PoE-powered ethernet network with a Cat5E (or better) networking cable. In case the available ethernet network is not PoE compatible, an additional PoE injector shall be applied in between. The maximum distance between the PoE switch and the expander should be 100 meters. The operation of the expander can be monitored through the indicator LEDs on the front panel of the unit, which indicate the input signal, clipping, network status or power status.

2. Connecting the 3-pin terminal block connector

The 3-pin terminal block connector shall be connected to the 3-pin pluggable terminal block on the back panel, Depending on the NIO2xx model, NIO204 has 4 channel balanced line output terminals.

NIO240 has 4 channel line/mic input terminals. NIO222 has 2 channel mic/line terminals and 2 channel balanced line output terminals.

3. Connecting the Bluetooth

The NIO2xx series has Bluetooth, and pairing can be enabled in various ways. Using the PAIR button or establishing a contact on BT PAIR terminal or using Audac Touch™ enables Bluetooth pairing when LED blinks in blue color.

Factory Reset

- In order to perform a factory reset on the NIO2xx series, power the device in a normal way.
- Later, hold the PAIR button for 30 seconds and re-power the device within 30 seconds after releasing the button. The device will perform a factory reset at start-up.

Configuring the NIO2xx series

Dante controller

- Once all connections are made, and the NIO2xx series wall panel is operational, the routing for the Dante audio transfer can be made.
- For the configuration of the routing, the Audinate Dante Controller software shall be used. The use of this tool is extensively described in the Dante controller user guide which can be downloaded from both Audac (audac.eu) and Audinate (audinate.com) websites.
- In this document, we quickly describe the most basic functions to get you started.
- Once the Dante controller software is installed and running, it will automatically discover all the Dante-compatible devices in your network. All devices will be shown on a matrix grid with on the horizontal axis all the devices with their receiving channels shown and on the vertical axis all the devices with their transmitting channels. The shown channels can be minimized and maximized by clicking the '+' and '-' icons.
- Linking between the transmitting and receiving channels can be done by simply clicking the cross points on the horizontal and vertical axis. Once clicked, it only takes a few seconds before the link is made, and the cross point will be indicated with a green checkbox when successful.
- To give custom names to the devices or the channels, double-click the device name and the device view window will pop up. The device name can be assigned in the 'Device config' tab, while the transmitting and receiving channel labels can be assigned under the 'Receive' and 'Transmit' tabs.
- Once any changes are made to linking, naming, or any other, it is automatically stored inside the device itself without requiring any save command. All settings and linkings will be automatically recalled after power off or re-connection of the devices.
- Besides the standard and essential functions described in this document, the Dante Controller software also includes many additional configuration possibilities that might be required depending on your application requirements.
- Consult the complete Dante controller user guide for more information.

NIO2xx series settings

Once the Dante routing settings are made through the Dante Controller, other settings of the NIO2xx series expanders can be configured using the Audac Touch™ platform, which can be freely downloaded and operated from various platforms. This is very intuitive to operate and automatically discovers all available compatible products in your network. Available settings include input gain range, output mixer, as well as advanced configurations such as WaveTune™, and much more.

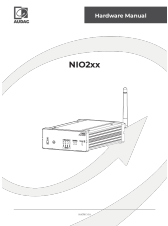
Technical Specifications

Inputs	Type	Mic/Line (NIO240/NIO222)
	Connector	Back: 2 x 3-pin terminal block (NIO222) 4 x 3-pin terminal block (NIO240)
	Impedance	10 kOhm Unbalanced 20 kOhm Balanced
	Sensitivity*	0 dBV (Line) / -35 dBV (Mic)
	THD+N	< 0.02% - 0.013% (Line) < 0.1% - 0.028% (Mic)
	Signal / Noise	> 93 dBA (Line) / > 86 dBA(Mic)
	Type	Bluetooth receiver (Version 4.2)
	Type	Dante™ / AES67 (4 Channels) RJ45 with indicator LEDs
Configurable Settings		Gain, AGC, Noise Gate, WaveTune™, Maximum Volume
Output	Type	Balanced Line (NIO204/NIO222)
	Connector	Back: 2 x 3-pin terminal block (NIO222) 4 x 3-pin terminal block (NIO204)
	Impedance	52 Ohm
	Type	Dante™ / AES67 (4 Channels)
	Connector	RJ45 with indicator LEDs
	Output level	Switch between 0dBV and 12 dBV
Configurable Settings		8 Channels Mixer, Maximum Volume, Gain
Power supply		IEEE 802.3 af/at
Power consumption	(BT paired)	3.75W (NIO222)
		3.54W (NIO240)
		3.59W (NIO204)
Phantom power		48V DC
Noisefloor		-76.5 dBV
Dimensions	(W x H x D)	108 x 44 x 165 mm
Weight		0.48 kg
Accessoiries	Included	Bluetooth antenna
	Optional	MBSlxx setup box installation accessories
Compatible devices		All Dante compatible devices

Input and output sensitivity levels defined are referred to as a -13 dB FS (Full Scale) level, which is consequent through digital Audac devices and can be digitally gained when interfacing with 3rd party equipment.

Discover more on audac.eu

Documents / Resources

 The image shows the cover of the 'Hardware Manual' for the AUDAC NIO2xx Network Module. It features a small image of the module, which is a rectangular device with a single antenna. The text 'NIO2xx' is prominently displayed above the module image. The top of the cover has a dark header with the text 'Hardware Manual'.	<p>AUDAC NIO2xx Network Module [pdf] Owner's Manual NIO2xx, NIO2xx Network Module, Network Module, Module</p>
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References

-  [Inspiring sound solutions | AUDAC](#)
- [User Manual](#)

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