NETBOX 8 AD
NETBOX 32 AD

Audio over IP Interfaces and routers using AES 67-compatible Dante™ protocol.

Dante™ SPOKEN HERE /AES67

AEQ

Audio over IP Routing System

IP based multichannel Audio Network

With analog, digital and IP audio inputs / outputs.

EQUIPMENT DESCRIPTION

Netbox 8 AD and Netbox 32 AD provide line-level analogue, digital AES/EBU and USB high quality inputs and outputs, available anywhere through an IP network using AES67-compatible DanteTM protocol.

They also feature general-purpose inputs and outputs (GPIO), that can be used to transport signaling interfaces among the different devices in the IP network.

Netbox 8 AD
Netbox 8 AD comes with 8 bidirectional IP channels plus 8 external inputs and 8 outputs, distributed in 4 analogue mono and 2 digital stereo. They can be configured as AES/EBU or SPDIF standards. The second digital stereo channel can also be switched to a USB connector to ease the connection to an audio workstation. It also provides 4 GPI and 4 GPO. The GPIO ports includes a power supply pin to feed the external circuitry.

Due to its small footprint, it can be useful to give IP access to analog or digital consoles that are not ready for this type of connectivity from factory, for recording rooms, talk-rooms or any other auxiliary location.

Netbox 32 AD
Netbox 32 AD has 32 bidirectional IP channels plus 32 external inputs and 32 outputs, distributed in 16 analogue mono and 8 digital stereo. The stereo digital audio channels can be configured as AES/EBU or SPDIF standard. It also incorporates 16 GPI and 16 GPO (each GPO connector includes a power supply pin to feed the output circuitry). Due to its high input and output capacity, it is especially suitable for central controls and link dispatches and also to increase or distribute the capacity of TDM BUS matrixes such as the AEQ BC 2000D.

SPECIAL NETBOX 32 AD VERSIONS

Netbox 32 AD MX 64x64 Router
Performs as a mixing and distributing matrix, so it can mix inputs combinations (each one with independent relative level) to any of its 64 outputs (16 analogue, 16 digital and 32 IP Dante), as programmed using Netbox RTC application.
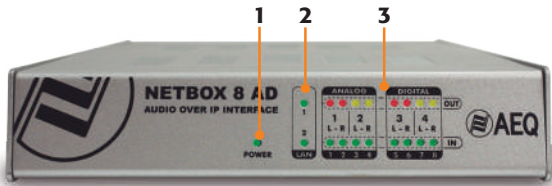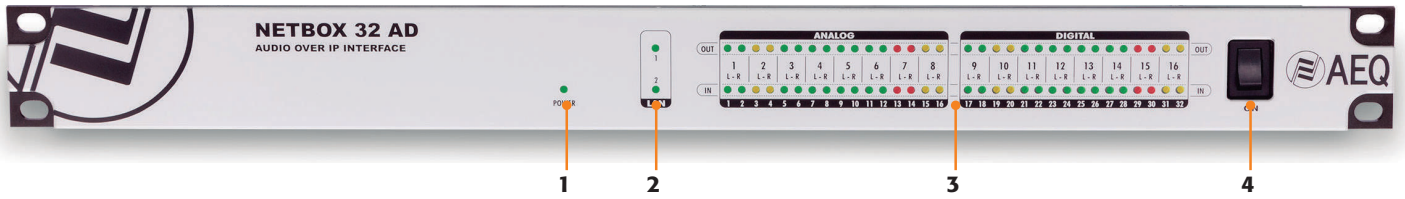
Netbox 32 AD VOX
Operates as a multichannel level detector for camera selection in Visual Radio systems.

Front Panel Elements

1 **Power-ON LED.** Indicates the device's power supply status.

2 **LAN LEDs.** Indicate the status connection of the audio over the following local area network ports: LAN 1 (main interface) and LAN 2 (secondary interface).

3 **Audio level LEDs.** Each LED indicates the level of each device's input or output channels.

4 **Power switch.** Netbox 32 has a power switch located in its front panel.

Rear Panel Connectivity
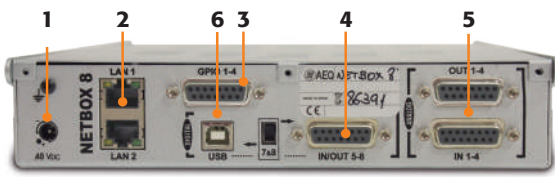
1 **Power input:** Netbox 32 features a universal-input internal power supply (with optional redundancy), while Netbox 8 has an input for an external power supply (provided).

2 **Ethernet ports (LAN 1 and LAN 2).** Both devices feature two Ethernet ports: LAN 1 must always be wired, while LAN2 is to be connected only when the system is configured in "Daisy Chain" mode or a redundant system is set up.

3 **GPIO connectors (DB15).** Netbox 32 includes two of these connectors including 8 GPI each, and another two with 8 GPO each. Netbox 8 has a single connector including 4 GPI and 4 GPOs. All the connectors have a common ground and provide a 5V reference signal. Thanks to the open protocol implemented, operation with third-party devices is possible, allowing GPI and GPO transportation between systems using the IP network.

4 **AES-3 / SPDIF digital inputs and outputs, also using female DB15 connectors.** 4 dual circuits per connector, 2 input + 2 output connectors in Netbox 32, and one of each kind in Netbox 8.

5 **Analogue inputs and outputs use female DB15 as well:** 4 circuits per port. 4 input + 4 output ports in Netbox 32, and one input plus one output port in Netbox 8.

6 **USB digital inputs / outputs.** When the back-switch is set to its lower position, Netbox 8 has its second dual digital input over a Type-B USB connector labeled as "USB". The second output is both present in the USB and through the DB15 connectors, no matter what the switch position is set to.

Netbox 8 and Netbox 32 are controlled by default using Netbox Tool and Dante Controller.

Netbox Tool application

Setup Wizard running over Windows operating systems, offering the following features:
• IP configuration and synchronization.
• Input and output gains control, stereo pairings and phase (Figure 1).
• GPIO configuration, selection of the network devices receiving its GPI and pairing of physical and virtual GPIO (Figure 2).
• IP addresses configuration to send the vumeters for any of the device inputs (analogue, digital or Dante), in order to link to Visual Radio systems.

"Dante Controller" application (Figure 3)

Running over Windows operating system, offering the following features:
• View all Dante-enabled audio devices and their channels on the network.
• View Dante-enabled device clock and network settings.
• Route audio on these devices, and view the state of existing audio routes.
• Lock and unlock Dante devices.
• Change the labels of audio channels.
• Customize the receive latency (latency before play out).
• Save audio routing presets.
• Apply previously saved presets.
• View and set per device configuration options.
• View network status information, including: multicast bandwidth across the network and transmit and receive bandwidth for each device.
• View device performance information, including latency statistics and packet errors.
• View clock status information for each device, including frequency offset history and clock event logs.

Netbox 32 operates as a 64x64 audio matrix using "Netbox RTC" real time control software.

Netbox RTC application

Running over Windows operating systems, it performs the following features:
• Routing with audio mixing and distribution coming from mono or stereo analogue, digital and Dante inputs, delivering them to analogue, digital or Dante outputs.
• Configuration and scheduling salvo management.
• Multi-user and multi-device control. Different views and particular scenarios can be configured, and critical lines can be protected.
• Dante signals are routed within the IP network using "Dante Controller".

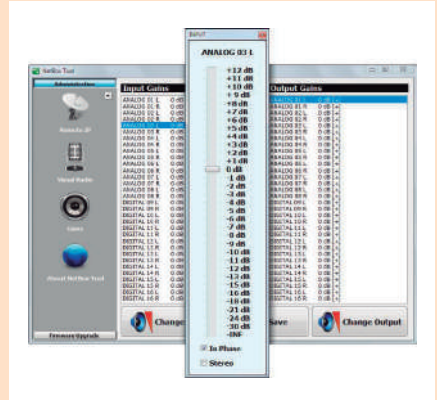*More information can be found in the specific documentation.*
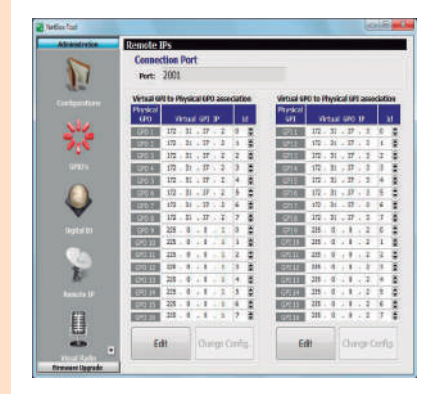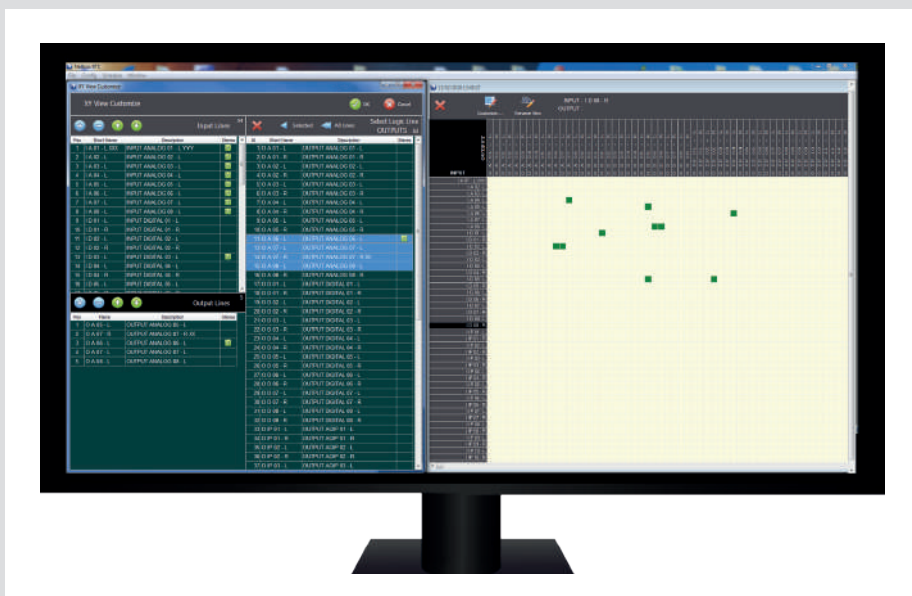

Figure 1. Audio gain adjustment in Netbox Tool.

Figure 2. Network GPIO pairing.

Figure 3. Netbox 32 configured with Dante Controller in order to communicate with three Olympia 3 commentary units.

Netbox RTC.

TECHNICAL SPECIFICATIONS

Inputs and outputs:
- Analogue channels:
  - NETBOX 8: 4 bidirectional channels.
  - NETBOX 32: 16 bidirectional channels.
- Dual or Stereo digital channels:
  - NETBOX 8: 2 bidirectional channels.
  - NETBOX 32: 8 bidirectional channels.
- Dante / AES 67 channels:
  - NETBOX 8: 8 bidirectional channels.
  - NETBOX 32: 32 bidirectional channels.
- Balanced electronically analogue line-level inputs and outputs.
- Maximum analogue input and output level: +24 dBu.
- Nominal analogue input and output level: +4 dBu (-20 dBFS).
- Bandwidth: 20 to 20.000 Hz @ +/- 0.5 dB.
- Input and output gain adjustment range: +12 dB / - (individually or in pairs).

GPIOs:
NETBOX 32 AD provides 16 physical GPI into 2 DB15 connectors, 16 physical GPO in two DB15 connectors and 265 virtual GPO that may be used to perform any of the following functions:
- Transportation of signalling between devices
- Informing about audio presence at any input.
- Informing about audio absence in any output.
- Remote muting of any output.
- Activation and triggering of macros and salvos.

Physical GPI and GPO are standard GPIO, while virtual GPIO use AEQ's proprietary protocol, although it is starting to be implemented by several integrators. GPIO can also be transported through the IP network between compatible devices. This way, a GPIO can drive GPOs in other equipment. This is what we call "Virtual GPIO".

DANTE™ Network Technology:
- Data format: Dante Audio over IP technology. AES 67 compatible
- Plug-and-play technology - automatic detection of the hardware and simple audio routing.
- Precise sample-level synchronization, even through several switches.
- Very low and deterministic delay in the entire network.
- Flexible and scalable network topology, supporting a great number of audio transmitters and receivers.
- Supports a single integrated network used for audio, video, control and monitoring. Compatible with other kinds of traffic using QoS management.
- Uses low-cost, off the self network infrastructure.
- 24-bit , 48 KHz. audio resolution.
- Delay: 1-2 ms (@ 48 KHz typical, depending on network performance and complexity).
- 2 RJ45 Ethernet ports per interface, 1000 BASE-T, transformer isolated, that can be used for redundancy or daisy-chain connections.
- Binary rate: 100/1000 Mbps.
- Maximum segment length: 100m max. over CAT5e or better cabling.

Redundancy:
- NETBOX 32 AD optionally device features a redundant power supply. In case that one of them stops receiving mains or fails, the system is fed by the other one without any operation disruption.
- NETBOX 32 AD MX includes two Ethernet ports. These may be configured in "Daisy Chain" mode, Primary/Secondary or Master/Slave modes.
- When Primary/Secondary redundancy mode is configured, the device uses Dante native redundancy system, which allows for Primary/Secondary failover without loosing audio samples.

Mixing:
Apart from its processing capabilities, NETBOX 32 AD MX can also mix any of its inputs to any output. This means that any set of inputs can be mixed to any of the outputs. Each output gain can be individually adjusted. They can also be muted.

GENERAL SPECIFICATIONS

Refrigeración:
- Cooling: absolutely quiet natural convection cooling system, compatible with studio operation.
- Audio line inputs and outputs compatible with "FR CAB INP" wiring accessory.
- Device GPIs and GPOs compatible with "CP CAB GPIO" wiring accessory.

Dimensions and weight:
- NETBOX 32 AD: 44 x 482 x 361 mm (1.73" x 18.97" x 14.21"). 4,5 Kg. (9.92 lbs).
- NETBOX 8 AD: 44 x 211 x 300 mm (1.73" x 8.30" x 11.81"). 1,8 Kg. (3.96 lbs).

Power supply:
- NETBOX 8: External connector (provided) 48V DC power supply. This power supply admits 90 - 264V AC, 47-63Hz. 20VA.
- NETBOX 32: Redundant internal power supply, admitting 90 - 264V AC, 47-63Hz.30VA.

Temperature range:
- -10 to + 45 º C (14 to 114 º F).

Easy installation:
NETBOX 32 as a 1U high 19" rack device.
NETBOX 8 has half-width rack width and is provided with two rack-fixing angles:
- Two devices can be joined using the provided brackets and installed together using a rack-fixing angle each, taking a single unit 19" rack space.
- A single device can use a single 19" 1U unit when installed with the optional rack-mounting kit.

Versions:
- Netbox 8 AD: 8 I/O Dante, 4 I/O Analog, 2 I/O Digital Dual Stereo.
- Netbox 32 AD: 32 I/O Dante, 16 I/O Analog, 8 I/O Digital Dual Stereo.
- Netbox 32 AD 2PS: Features of Netbox 32 AD with dual Power Supply.
- Netbox 32 AD MX: Netbox 32 AD inputs and outputs with routing and mixing functions.
- Netbox 32 AD MX 2PS: Features of Netbox 32 AD MX with dual Power Supply.
- Netbox 32 AD VOX: Inputs and outputs of Netbox 32 AD with VOX CONTROL function for Visual Radio.
- Netbox 32 AD VOX 2PS: Features of Netbox 32 AD VOX with dual Power Supply.

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