

# White Paper DNP

## Audionet DNP: The Gate to the Music

Components made by Audionet are no marketing products, they are authentic. Conceived and developed with scientific inspiration, professional art of engineering and passion for the culture of good tone. True exceptional creations for a thrilling musical enjoyment which have gained an excellent reputation among connoisseurs worldwide. Piece by piece, each of our devices is designed and manufactured under the same roof here in Bochum – by experienced colleagues with utmost precision and inborn passion.

The Audionet DNP (**D**igital **N**etwork **P**reamplifier) is the universal interface to the world of digitally stored music and the world of analogue audio. No matter if supplied by an analogue source or if it is stored on a computer, a server, a drive, a stick or an iPod or streamed from the internet, via cable or wireless, the Audionet DNP will turn any analogue and digital music into a captivating and emotional listening experience.

The Audionet DNP is a smart partner with outstanding operational possibilities. Apart from the Audionet system remote control, the Audionet DNP may be operated through every smartphone with the Android operational system or Apple iPhones or iPads with proprietary apps. It has an RS 232 interface which enables an easy integration into house control systems. And the Audionet DNA is the first amplifier on the planet which may also be controlled entirely by a computer and thus fully integrated into a network environment. A dedicated user interface makes it possible for the first time to adjust and operate all functions and settings using a wireless mouse or keyboard.

The Audionet DNP offers unique setting options which give high-quality music reproduction a new basis. To this end we have further enhanced our proven and acclaimed digital filter technology and integrated into the Audionet DNP. It is the very first stereo preamplifier with an exceptionally efficient and precise delay, bass and equalizer management. This allows for the first time a time-coherent balance setting and the integration of up to two subwoofers, which may be adjusted separately in all parameters, plus the correction of the room acoustics or other tonal problems. Each loudspeaker ensemble can be optimally configured and perfectly tuned to the room situation. Joined up with Audionet's intuitive analyser and correction software CARMA, the room data are captured by the computer, analysed and optimised and the correction settings transferred to the Audionet DNP. That way even laymen will be able to achieve almost professional results.

The Audionet DNP is lavishly equipped and leaves nothing to be desired. It can receive internet, FM and AM radio, has a digital iPod and USB Audio interface, may be fitted with a first-class phono pre-amp and offers an excellent A/D converter to digitalise any analogue sources on a high level.

Its sound is rock-solid and powerful, spacious and full of contour, natural and with finesse, turning bits and bytes into an unprecedented and vibrant sensual experience.

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During the design and realisation phase of the Audionet DNP we combined new, innovative construction and circuit solutions with the proven knowledge of our digital and analogue technology. And we spared neither trouble nor expenses: more than 4,000 electronic parts ensure a most accurate digital and analogue signal processing.

For digital signals we have provided 12 inputs altogether, from WLAN, Lan to USB Audio 2.0 to electrical and optical S/PDIF, up to 192kHz/24Bit. For analog signals we have provided five inputs, Cinch and XLR.

The digital signal processing is accomplished with efficient signal processors and our proprietary Audionet software which was developed and continuously improved exclusively under audiophile aspects in more than 15 years of painstaking labour.

The double precision bass management uses a 48bit resolution at all sampling frequencies. Even the very lowest frequencies are therefore precisely reproduced and accurately processed. The bass manager offers freely selectable cutoff frequencies, filter Q factors and subwoofer phases. Thus you can integrate up to two subwoofers into the system and into the room in the best possible way. Alternatively the two analogue subwoofer outputs may be used as multiroom outputs.

The digital parametric equalizer has five Minimum Phase Equalizers (MPE) both for the main channels and the subwoofer outputs. For each MPE the filter type, frequency, gain and Q factor can be selected within an unusually wide adjustment range and disturbing room interference and tonal annoyances efficiently compensated.

The delay manager has an adjustment range of up to 7 m and automatically calculates the delay times from the distances.

With the D/A conversion we focused our greatest attention on eliminating jitter, the wobbling of digital signal slopes. Jitter faults curtail the sound reproduction in every respect: imaging, stage and depth rendition will be impaired. The conversion is done using Audionet's Intelligent Sampling Technology which guarantees an absolutely flawless recovery of the analogue signal from the digital bit stream. For this purpose the data are sent through a sophisticated, two-stage filtering and decoupling procedure. First the input data are filtered with Audionet's proprietary software using a powerful signal processor and upsampled synchronously. The filters have been designed under audiophile aspects with regard to an optimised transient and frequency response. The thus optimised data are then resolved through an asynchronous upsampling procedure at 192kHz/24bit. Hereby the bit stream is completely isolated from its input clock and its associated jitter. The data are then fed to two high-performance converters, which are clocked by special ultra-precision quartz crystals, and individually processed per channel into analogue signals. This method ensures that jitter faults are almost entirely eliminated in the analogue signal. No information gets lost and every bit of information will be processed at the right time, bringing forth an unmatched clarity, room depth and stage imaging. The digital signal processing has a dedicated power supply of its own.

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The analogue amplifier of the Audionet DNP represents the latest version of Audionet's worldwide respected and award-winning ULA (Ultra Linear Amplifier) technology. This highly complex circuit topology, initially conceived with medical engineering in mind, delivers metrological results which mark a limit of feasibility.

The volume is regulated by a two step high precision metal film resistors network, which is switched electronically by real-time linearized C-MOS devices. This guarantees constant dynamic and distortion free characteristics throughout the entire control range.

An encapsulated 100 VA toroidal transformer, special audio capacitors with total 62.000  $\mu\text{F}$  capacity and extremely fast, discreetly realized preregulators guarantee stable supply voltages. Additionally the voltage is smoothed locally by additional 12 discrete regulators.

All operational amplifiers in the signal path are discrete and optimized. The 6 operational amplifier modules have a gain-bandwidth product of 1.5 GHz. The input operational amplifiers have almost infinite input impedance and a constant capacity. As a result, they do not load the signal source. The signal and ground of the inputs are switched via gold-coated precision relays. The output operational amplifiers are class-A amplifiers with high bias current and are non-sensitive to power amplifier reflux.

To optimise the high frequency properties, the circuits have been miniaturised as far as possible. The remaining signal paths have been limited to an absolute minimum and contain no soundcritical parts such as coils or chokes.

At every soundcritical point of the Audionet DNP we use only the best parts or components resp. that we can purchase worldwide and which in some cases are custom-made for us. For instance the filter caps are made to our own specifications; we get a large part of our high audiograde electrolytic caps with a silk dielectric from Japan; we employ mica caps (a conductive stone) which are made for us in China and India, and selected high-current foil caps from Germany with an ultralow loss angle; we use a top-grade silver/gold alloy for our internal wiring plus the best available connection systems from our colleagues from WBT in Essen.

We recommend Audionet manufactured cables: <http://www.audionet.de/main/kabel/page.html>

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## Overview and technical data DNA

### Function

- network - compatible 2.2 channel stereo preamplifier

### Features

- streaming client for internet radio playback (vTuner Internet Radio Service), network devices (UPnP mediaserver), iPod (digital) und music data from USB memory sticks
- supported streaming client format: WAV (up to 192kHz/24Bit), FLAC (up to 192kHz/24Bit), AIFF (up to 192kHz/24bit), MP3, AAC, WMA, OGG-Vorbis
- USB Audio (up to 192kHz/24Bit),
- 2.0 to 2.2 stereo-operating (2 analogue subwoofer-outputs or usable as multiroom outputs)
- Parametric equalizer and Delaymanager for all outputs
- double-precision bass manager with 48bit-resolution and free adjustable crossover frequencies and filter qualities
- Audionet Intelligent Sampling-Technology with asynchronous upsampling up to 192kHz/24bit
- precise clock generator for the elimination of clock flank deviations (Jitter)
- Sampling frequencies and resolution of the digital inputs: 32 kHz to 192kHz/24bit
- Audionet HighBit-interface for all audio data including DVD-A and SACD
- Radio receiver for UKW with RDS-funktion
- Audionet ULA-Technology (Ultra Linear Amplifier)
- completely DC-coupled, no capacitors in the signal path
- one toroid transformer with 100 VA for analog signal processing
- filtering capacity in total of 62.000  $\mu$ F
- separate power supplies for digital and analog section
- gold-doped, pure silver ,solid core signal cabling
- microprocessor with its own power supply controls and handles all functions
- remote activation of other Audionet component via Audionet Link (optical fiber)
- headphones output electronically switchable
- automatic mains phase detection

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## Options

- MC/MM-phono preamplifier module
- Audionet system remote control Harmony One
- Audionet EPS G2

## Bassmanager

- management of one (mixed-mono) or two subwoofer (mixed-mono or stereo)
- data processing with 48bit resolution (double precision)
- channels/channel-groups can selectively be driven with the full signal or across the digital frequency crossover with adjustable crossover frequencies and filter qualities
- X-Bass: Subwoofer can be configured as additional active bass
- filter quality adjustable from 0,3 to 2,00 in 12 logarithmic steps
- crossover frequencies adjustable from 20 Hz to 303 Hz in 51 logarithmic steps
- Subwoofer phase switchable

## Delay manager

- Adjustment range: Distance Listening position <-> loudspeaker 0m to 7m
- automatic calculation of the delays resulting from the distance settings
- Subwoofer delay offset: Phase fine-tune for best impulse response (+/- 7m)

## Volume level offset

- Main channel: -9 to +9 dB in 1 dB-steps (Balance L-R)
- Subwoofer: -24 to +12 dB in 0,5 dB-steps

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## Equalizer

- 5 MPE (Minimum Phase Equalizer) for each main channel and Sub
- Adjustment range for each MPE:
 

Filter type	Peak-Filter, High-Shelve, Low-Shelve, high-pass filter, low-pass filter
Frequency (f):	20 Hz to 20 kHz, 128 logarithmic steps
Gain:	-12 dB to +6 dB, 0,5 dB-steps
Quality (Q):	0,3 bis 8,0, in 20 logarithmic steps
- Import of CARMA-Equalizer-Settings

## Connectors

- WLAN 802.11b/g – WEP, WPA, WPA2
- LAN/Ethernet (RJ 45)
- USB 2.0 for external media or for iPod control
- USB Audio 2.0 (up to 192kHz/24bit)
- RS232 (control input)

## In- and outputs

- Audio input (analog)
 

4 pair Cinch Line, gold plated, Teflon insulated
1 pair Neutrik XLR symmetric, gold plated
- Audio input (Digital)
 

4 Cinch, 75 Ohm, gold plated, Teflon insulated
4 optical (TosLink)
1 Neutrik XLR AES/EBU, 110 Ohms, gold plated, Teflon insulated
1 USB Audio Typ B
- Audio output
 

2 pair Cinch Pre-Out, gold plated, Teflon insulated
2 Cinch Sub-Out (Multiroom), gold plated, Teflon insulated
1 pair Neutrik XLR symmetric, gold plated
6.3 mm socket (headphones), electronically switchable

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- Additional connectors
  - 1 USB 2.0 Typ A
  - WLAN antenna (SMA)
  - 1 Ethernet 10/100 MBit (RJ 45)
  - FM - antenna, 75 Ohm
  - RS-232
  - Screw connectors for record player earth connection
  - Screw connectors for additional earth connection, gold plated
- remote activation
  - 2 Audionet Link OUT, optical (TosLink)
  - 3,5mm-jack plug as trigger output with 12V-switching voltage (optional 5V)
- ext. power supply EPS G2: 5-pol-socket
- mains: IEC male power insert connector

## Specifications

- frequency response
  - 0 – 1.000.000 Hz (-3 dB), DC-coupled
  - 2 – 1.000.000 Hz (-3 dB), AC- coupled, DC-Servo 1st Order
- slew rate
  - 10 V/ $\mu$ sec
- channel separation
  - between channels: >100 dB at 20 kHz
  - between inputs: >108 dB at 20 kHz
- input voltage
  - max. 5 Vrms
- input impedance
 

Line	50 kOhm real
XLR	7 kOhm real
- output voltage
 

Line	max. 6 Vrms
XLR	max.12 Vrms
Headphones	max. 6 Vrms (max. gain 6 dB)
- output impedance
 

Line	24 Ohm real
XLR	48 Ohm real
Headphones	24 Ohm real

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## Analog input

- THD+N > 108 dB from 20 Hz up to 20 kHz at  $V_{in}$  5 Vrms
- SNR > 120 dB at 1kHz referred to  $V_{in}$ , max

## Digital input

- Sample frequency 32 to 192 kHz
- THD+N at 1kHz, -60 dBFS, Sample frequency 48 kHz: Front: 104 dB/107 dB(A)

Mains:	220..240 Volt / 50..60 Hz
power consumption:	< 1 W stand-by, max. 150 W
dimensions:	width 430 mm   height 120 mm   depth 360 mm
weight:	12 kg

## Finish

front:	brushed aluminium, 10 mm, black anodized, light grey printing brushed aluminium, 10 mm, silver anodized, black printing
display:	red or blue
cover:	aluminium, 4 mm, black anodized
side plates:	aluminium, 8 mm, black anodized
Chassis:	2 mm sheet steel, black varnished

Errors and omissions excepted.