Analog Sound
Digital Recall

WesAudio

www.WesAudio.com

WesAudio

ngTubeEQ

User Manual

EN

Thank You for the purchase of ngTubeEQ

Next Generation Tube Equalizer with digital recall.

With kind regards

Radoslaw Wesolowski and Michal Weglicki

Next Generation Tube Equalizer with digital recall

For decades, tube equalizers have been cherished for their rich, musical sound, shaping the sonic character of countless classic recordings. Our ngTubeEQ elevates this legacy, offering a refined, analog experience seamlessly integrated into the modern digital workflow. With its lush tonal quality and intuitive digital control, the ngTubeEQ is set to become an indispensable tool in studios worldwide, continuing our tradition of blending vintage charm with contemporary functionality. Experience the best of both worlds – the soul of vintage sound and the ease of digital technology with ngTubeEQ.

TABLE OF CONTENTS

1. Main Features 7
2. Hardware 8
2.1. Specification 8
2.2. Front Panel and Main Functions 9
2.3. Rear panel 14
2.4. Audio Signal Connectivity 16
3. Analog Processing 17
3.1. Analog Signal Flow 17
3.2. Analog Processing Blocks 19
3.2.1. Modes Of Operation - Dual / Stereo / Mid-Side 19
3.2.2. THD – Total Harmonic Distortion 20
3.2.3. Passive Equalization Section 21
3.2.4. Passive Equalization Section – Curves 24
3.2.5. High Pass Filter (HPF) 29
3.2.6. Low Pass Filter (LPF) 29
3.2.7. Low Pass Filter (LPF) & High Pass Filter (HPF) Curves 30
3.2.8. OUTPUT Modes 31
3.3. Analog Features 32
3.3.1. Constant Q vs Proportional Q 32
3.3.2. Listen Mode – Band Focus Feature 33
3.3.3. Iron Link 34
3.3.4. Gain Modes 35
4. Software Setup 37
4.1. Installation Process 37
4.1.1. For Windows Users 37
4.1.2. For OSX Users 37
4.1.3. Troubleshooting 38
4.2. GCon Manager 39

4.3. How to check Firmware version 40
4.4. How to perform firmware upgrade 41
4.5. Set up GCon Connection 42
4.5.1. USB 43
4.5.2. Ethernet 44
4.5.2.1. Default network configuration via DHCP. 45
4.5.2.2. Enable/Disable DHCP 46
4.5.2.3. Set Up Static IP Address 47
4.5.3. Direct connection – setting IP address on PC/MAC. 48
5. Digital Control / Recall 50
5.1. DAW Plug-in 51
5.1.1. Stereo Plug-in – Dual and MS Modes 52
5.1.2. Stereo Plug-in - Stereo Mode 55
5.1.3. Mono Plug-in 56
5.1.4. Dual/MS Mode – Automation When Parameter Link Is Enabled 57
6. Other Functions 58
6.1. Operation modes: 58
6.2. Internal Memory Management 59
6.2.1. Fast Presets A/B/C 59
6.2.2. Internal Presets 59
7. Abbreviations and terms 60
8. Warranty 61
9. History 62

1. Main Features

- **100% Analog Parametric Tube Equalizer:** The ngTubeEQ offers pure analog processing with a substantial 26dBu headroom.
- **Custom Passive Section:** At its core, the ngTubeEQ features a passive section built around custom inductors for exceptional sound quality.
- **Four Passive Bands with Extensive Range:** Boasting 12 selectable frequency points per band, covering from 22Hz to 28kHz.
- **Bypassable Passive Bands with Variable Q:** Each band is independently bypassable and includes a fully variable Q for nuanced sound sculpting.
- **Versatile Active Filters:** Active LPF & HPF filters with 12/24 dB per octave slopes, variable controls, and analog bypass switch.
- **Three Operational Modes:** Offering dual, stereo, and mid-side operational modes for flexible sound staging.
- **Comprehensive DAW Plugin Control:** Full control and instant recall through an efficient GUI in all plugin formats, compatible with PC/MAC across all DAWs.
- **Dual Output Options:** GREEN for electronically balanced output, RED for a tube amplification stage with transformer output and IRON PAD.
- **THD with Proprietary Circuitry:** Features a unique harmonic distortion circuit, fully bypassable, that integrates with the gain structure for adjustable inductor-based saturation.
- **Band Listen Mode** to isolate and focus on band fundamental content via LPF and HPF adjustment.
- **Capability to store up to 100 presets** on the device's internal memory for operation without plugin integration.
- **Unique Q Settings:** Proportional and Constant Q options, making it a rare EQ with both constant and variable Q implementations.
- **Flexible Gain Modes:** Two gain modes – 15dB (±15dB range, 0.25dB step) and 5dB (±5dB range, 0.1dB step).
- **Integrated LCD Parameter Display:** A compact LCD screen that visualizes metering and parameter changes upon knob interaction.
- **Comprehensive Metering:** Integrated LCD and plugin metering for detailed input and output monitoring.
- **Hardware A/B/C Memory Settings:** Easily switch between three analog preset settings using simple buttons, even when using the ngTubeEQ as a pure analog processor.
- **USB and Ethernet Connectivity:** Supports direct USB connection or network integration via Ethernet for versatile setup options.
- **Analog Automation Capability:** Draw automation lines in your DAW to control the analog device settings dynamically, with touch-sensitive encoders for recording automation back to your DAW.

2. Hardware

This chapter will go through all analog features and explain all hardware aspects of ngTubeEQ.

2.1. Specification

Frequency response Normal (green)	5Hz-100kHz (-0.5dB)
Frequency response Tube (red)	20Hz-25kHz (0.5dB)
Dynamic range	122dB
THD+N Normal(green)	0.0025% (+4dBu), 0.009% (+18dBu)
THD+N Tube(red)	0.04% (+4dBu), 0.016% (+18dBu)
Noise	-93dBu (A-weight)
Crosstalk	-120dB (40Hz), -100dB (20kHz)
Max input level	+28dBu
Max output level	+27dBu
Input impedance	44kohm
Common mode rejection ratio	70dB
Output impedance Normal (green)	100ohm
Output impedance Tube (red)	150ohm
Power consumption (MAX)	45W

2.2. Front Panel and Main Functions

Analog Sound
Digital Recall

WesAudio

1) **Passive EQ Section**
    a. GAIN KNOB:
        i. Adjusts boost or cut within +/-5dB or +/-15dB ranges, based on the GAIN MODE selection.
        ii. Pushing the knob toggles the band's bypass ON or OFF.
        iii. A double push inverses the GAIN value.
        iv. Holding the knob for 2 seconds resets the band to 0 dB.
    b. Frequency Knob: Offers 12 selectable frequency points per band.
    c. Q Knob:
        i. Determines the Q value for each band.
        ii. Pushing the knob switches between BELL and SHELF settings for the band.
    d. For more information, see the Passive Equalization Section.
2) **High Pass Filter (HPF)**
    a. Adjusts the HPF frequency from OFF to between 12 Hz and 300 Hz.
    b. Pushing the HPF knob toggles between 12 and 24 dB/Octave slopes.
    c. Holding the knob for 2 seconds toggles the filter ON or OFF.
    d. Fully right-turned knob disables the HPF, indicated as OFF on the plugin and LCD.
    e. When OFF, the HPF is completely bypassed.
    f. For more information, see the High Pass Filter (HPF).
3) **Total Harmonic Distortion (THD)**
    a. The knob adjusts saturation levels from 0% to 100%.
    b. At 0% position (fully left), the THD circuit is bypassed.
    c. Holding the knob and touching any frequency knob activates LISTEN MODE, isolating the selected frequency point.
    d. For more information, see the THD – Total Harmonic Distortion.
4) **OUTPUT Control**
    a. Adjusts OUTPUT level from -15dB to +15dB in 0.25dB steps, with distinct parameters for RED and GREEN modes.
    b. Pushing the knob switches between RED and GREEN modes.
    c. For more information about output stages, see the OUTPUT Modes.
5) **IRON PAD**
    a. Engages a passive attenuation circuit, active only in RED mode, for gain attenuation between 0 dB and 15dB.
6) **Low Pass Filter (LPF)**
    a. Sets LPF frequency from OFF, between 50kHz and 8 kHz.
    b. Pushing the LPF knob toggles between 12 and 24 dB/Octave slopes.
    c. Holding the knob for 2 seconds toggles the filter ON or OFF.
    d. Fully right-turned knob disables the LPF, shown as OFF on the plugin and LCD.
    e. When OFF, the LPF is completely bypassed.
    f. For more information, see the Low Pass Filter (LPF).

Analog Sound Digital Recall

The unit facilitates manipulation of internal presets stored in its memory through the middle panel. For comprehensive details on managing these presets, including saving, loading, and editing, please consult the Internal Presets chapter. This section provides in-depth guidance on maximizing the use of preset capabilities to enhance workflow efficiency and creative flexibility.

7) **Parameter Link:** Activating this button synchronizes adjustments across channels, ideal for stereo use. Adjustments are mirrored precisely across channels. To temporarily deactivate this linking, press and hold touch-sensitive encoders on both channels simultaneously. This functionality is exclusive to DUAL and MS modes and is inoperative in STEREO mode, where the Parameter Link button is automatically disabled. Pressing and holding this button for 2 seconds opens the PRESET MENU on the main display. For additional information, see the Internal Presets.
8) **Mode Selection (DUAL/STEREO/MS)**: This feature allows the selection of the unit's operational modes. For an in-depth explanation of each mode, please consult the Modes Of Operation - Dual / Stereo / Mid-Side. In addition to mode selection, the DUAL and M/S buttons serve a dual purpose by facilitating the copying of settings between channels in DUAL and M/S modes. This function streamlines workflow by allowing quick duplication of settings from one channel to another, enhancing consistency and efficiency in processing. To activate this feature:
    a. **Copy Channel Settings:** In DUAL or M/S mode, press and hold the DUAL button for two seconds until it begins to blink. This indicates that the unit is ready to copy the settings from one channel.
    b. **Execute Copy:** While the DUAL button is blinking, pressing the M/S button will copy the settings from the current channel to the other, ensuring both channels match in their processing settings.

    This method provides a quick and intuitive way to ensure consistency between channels, particularly useful in scenarios where starting points for adjustments need to be uniform before making further individual tweaks.
9) **Bypass Control:** Each channel is equipped with a true bypass. To toggle MUTE for a specific channel, press and hold this button for 2 seconds.
10) **The LCD display** enhances user interaction with real-time feedback and essential information:
    a. Parameter Visualization: Immediately upon touching any encoder, the LCD screen displays the current value of the adjusted parameter. This instant feedback ensures precise control over the unit's settings.
    b. Event Notifications: The screen also serves as an alert system for key events on the front panel, such as the connection of a plug-in, enhancing the user's awareness of the unit's status.
    c. Idle Mode Metering: When not actively adjusting parameters, the LCD transitions to a metering mode, showcasing:
        i. IN Metering: Displays input levels for each channel, ranging from 0 to 26dBu, allowing for real-time monitoring of signal input strength.
        ii. OUT Metering: Shows output levels for each channel within the same 0 to 26dBu range, providing immediate feedback on the signal levels being sent from the unit.
11) **Gain Mode –** The Gain Mode feature allows users to select the desired gain range for each EQ band, providing flexibility in how much boost or cut can be applied. The two options available are:

a. **5dB Mode:** Offers a subtler range of adjustment, suitable for fine-tuning and gentle sculpting of the audio signal.
b. **15dB Mode:** Provides a broader range, enabling more aggressive shaping and significant alterations to the sound.

Adjusting Gain Mode:

a. To change the Gain Mode directly from the unit's front panel, press and hold the Proportional Q (Prop. Q) button for 2 seconds. This action toggles between the 5dB and 15dB settings, adapting the unit for either precise adjustments or more substantial EQ changes.

12) **Preset Memory Buttons (A/B/C)**: Utilize these internal buttons to store and compare three distinct compressor settings, enabling straightforward comparison between setups. To copy any preset – please hold corresponding button unless it starts blinking, then just press preset button that you would like to overwrite.
13) **Proportional Q (PROP. Q):** Engage or disengage the Proportional Q mode for any channel with this button. A deactivated LED indicator on this button signifies that Constant Q mode is active. When this button is hold for 2 seconds, it will toggle between 2 gain modes – 5/15dB.
14) **Power Toggle (POWER):** This switch controls the power to the unit.

2.3. Rear panel

Analog Sound
Digital Recall

1. **AC Power Socket:** This is the designated point on the unit where the power cable is connected, linking the device to the main electrical supply. It's through this connection that the device draws alternating current (AC) power, essential for its operation. The socket is designed to accommodate the specific type of power cord that corresponds with the electrical standards of the region, ensuring the unit is powered safely and efficiently.
2. **Voltage Selector:** This feature provides the option to switch the unit's operating voltage between 115V (60Hz) and 230V (50Hz), catering to different regional electrical standards. It's crucial to use the correct fuses for the voltage setting you select to prevent damage. Always replace the fuses with the appropriate ones before changing the voltage selector to match the mains electricity supply of your location. This ensures the unit operates within its safety and performance specifications.

Digital Management Connections: The ngTubeEQ facilitates digital management through two connection options:

3. **USB:** Features a USB2+ compatible port for GCon management.
4. **Ethernet:** Offers an Ethernet port for GCon management using the UDP protocol (LAN within a single subnet).

Please be aware that only one type of connection can be active at any given time. To use the Ethernet connection, ensure the USB cable is disconnected from the unit's rear.

5. **SIGNAL CONNECTORS** - each channel contains following signal connectors:
    1. **XLR IN** – Input signal via XLR cable,
    2. **XLR OUT** – Output signal via XLR cable,
6. **Serial Number**.

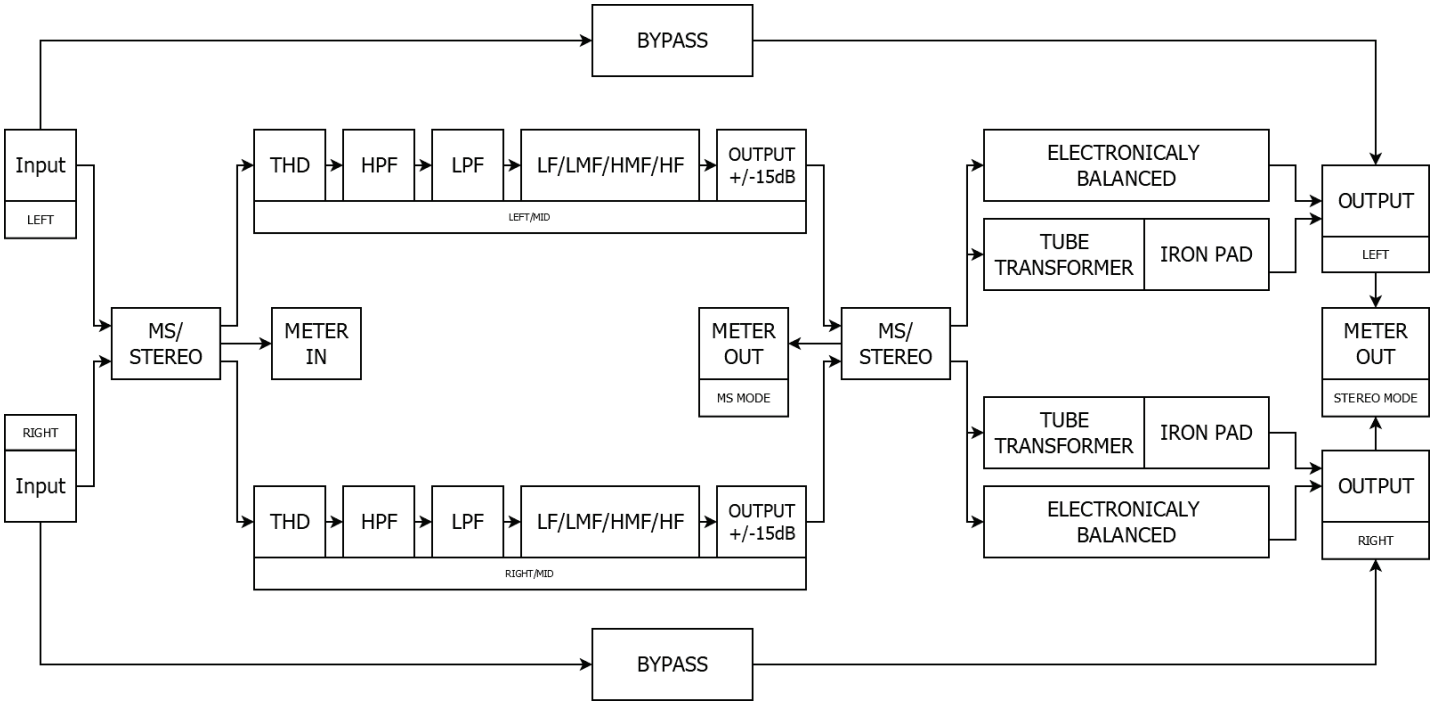
2.4. Audio Signal Connectivity

The ngTubeEQ is a state-of-the-art device that marries the warmth and richness of analog signal processing with the precision and flexibility of digital control. This means that while your audio signal paths are purely analog, passing through the device via XLR connections on the back panel for pristine quality, the extensive range of the unit's functions and parameters can be meticulously adjusted through a digital management protocol. Each channel's input and output are facilitated through these XLR sockets, ensuring high-quality, interference-free audio transmission.

3. Analog Processing

This chapter in depth describes analog nature of ngTubeEQ.

3.1. Analog Signal Flow



RELEVANT NOTES

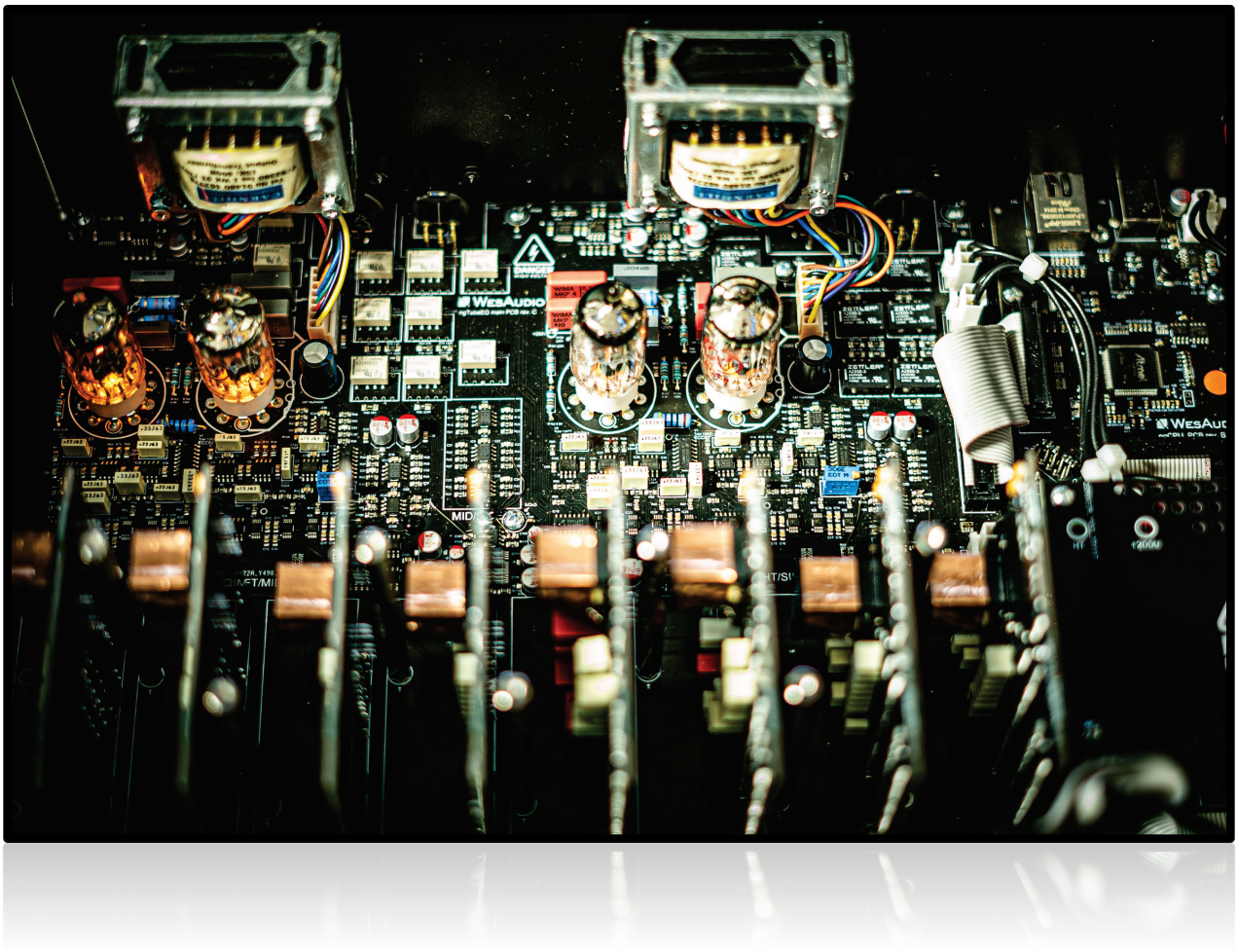
The **ngTubeEQ** remains a fully analog device, where certain features can influence one another due to its integrated design. While further details are provided in subsequent chapters, the following summary highlights key considerations regarding how specific functionalities interact within the unit:

- **Bypass Functionality**: Activating bypass directly connects the INPUT to the OUTPUT, rendering other features in the signal chain inoperative. For instance, the MUTE function will not work when bypass is enabled. If signal transmission occurs only in BYPASS mode, it's likely due to the INPUT from the interface being incorrectly connected to the INPUT of the device, instead of the opposite.
- **IRON Mode in Mid-Side (M/S)** Processing: In Mid Side mode, the IRON mode's value is uniformly applied to both channels. Since the output transformer (symmetrization) operates in Left/Right mode, it is external to the Mid/Side processing domain.
- **Metering in Mid-Side Mode**: Metering functions remain within the Mid/Side domain and are not influenced by the IRON PAD setting.

- **IRON PAD Function**: Positioned as the last analog circuit before the output XLR connector, the IRON PAD allows for passive signal attenuation right before it exits the unit. This feature offers additional control over transformer saturation depending on the incoming signal level. However, it's important to note that the IRON PAD setting does not affect internal clipping. For example, distortion from the Tube Amplification stage caused by excessively high levels will not be mitigated by adjusting the IRON PAD value.

3.2. Analog Processing Blocks

The ngTubeEQ is equipped with a series of analog processing blocks, each meticulously designed to contribute distinct tonal characteristics and functionalities to the audio signal. These blocks represent the core of the ngTubeEQ's capability to shape and enhance audio with precision, warmth, and flexibility. This chapter delves into the purpose and functionality of each analog processing block, offering insights into how they individually and collectively contribute to the ngTubeEQ's revered sound.



3.2.1. Modes Of Operation - Dual / Stereo / Mid-Side

The ngTubeEQ is designed with versatility in mind, offering three distinct modes of operation: Dual, Stereo, and Mid-Side (M/S). Each mode tailors the unit's processing to different mixing and mastering needs, from individual channel adjustments to cohesive stereo or spatial manipulation.

1) DUAL Mode

In DUAL mode, the ngTubeEQ treats the left and right channels as separate entities, allowing for independent EQ settings on each. This mode is ideal for situations where channels require different

treatment, such as when balancing stereo-recorded instruments or when creative effects are desired. The Parameter LINK feature enables the linking of channel settings; when activated and both channels are set identically, any adjustments made will mirror across both, essentially emulating STEREO mode behavior but with the flexibility to disengage and adjust independently if needed.

2) STEREO Mode

STEREO mode simplifies operation by consolidating control to a single set of parameters that affect both channels equally. In this configuration, the left/mid channel acts as the 'master,' and its settings are duplicated on the right/side channel. This unified approach is perfect for tasks requiring symmetrical EQ adjustments across both channels, ensuring a balanced and cohesive sound.

3) M/S (Mid-Side) Mode

M/S mode unlocks the ability to process the mid (center) and side (stereo difference) signals independently, offering a powerful tool for stereo image manipulation and spatial enhancements. The signal is decoded into mid and side components for processing and then re-encoded back to a stereo signal at the output. This mode is particularly useful for adjusting the balance between center-located elements and the ambient stereo field or for creative stereo imaging effects. With Parameter LINK enabled in M/S mode, adjustments such as output level changes affect both mid and side components equally, allowing for coordinated modifications to the stereo image.

The first part of the circuit engages mid-side encoding if the unit is set to M/S mode; otherwise, the signal is routed directly to each channel as is. These operational modes greatly expand the ngTubeEQ's utility in a mix, from detailed, channel-specific corrections in DUAL mode to broad, stereo-wide adjustments in STEREO mode, and nuanced spatial processing in M/S mode.

3.2.2. THD – Total Harmonic Distortion

The Total Harmonic Distortion (THD) feature represents a pivotal first analog block within the signal chain of the ngTubeEQ, renowned for delivering rich, controllable saturation through a proprietary circuit by WesAudio, a design highly esteemed within the audio industry.

Key Characteristics of THD:

- **Fully Variable Control:** The THD knob allows for seamless adjustments from 1% to 100%, offering a wide range of saturation effects. At 0%, the circuit is entirely bypassed via an analog relay, ensuring a clean signal path when saturation is not desired.
- **Harmonic Content Enrichment:** As the THD setting is increased, it incrementally adds more harmonic content to the signal. This capacity for enrichment helps in giving tracks a noticeable presence boost, a quality frequently sought after by engineers for making elements stand out in a mix.

- **Bypass Mechanism:** The thoughtful design includes a bypass feature that completely disengages the THD circuit at 0% saturation, preserving the purity of the signal and providing users with the flexibility to engage the effect only when needed.

Impact on the Passive Section:

- **Volume Boost and Saturation:** The THD control not only introduces harmonic distortion but also increases the signal volume, which in turn exerts more drive onto the passive EQ section. This increased drive can lead to further saturation, especially noticeable in the passive inductors, adding a distinct layer of character to the sound.
- **Compensation for Unity Gain:** Despite the significant volume boost provided by the THD, the ngTubeEQ intelligently compensates for this increase through output volume adjustments. This automatic compensation ensures that the unity gain is maintained, allowing for the saturation effect to be enjoyed without altering the overall level of the track.

The THD feature in the ngTubeEQ thus stands out as a versatile tool for engineers looking to imbue their tracks with warmth, character, and presence. With its fully variable control and sophisticated design, it provides a level of saturation that can significantly enhance the sonic quality of music productions, backed by the reassurance of maintaining unity gain throughout the process.

3.2.3. Passive Equalization Section

The passive EQ section stands as the heart of the unit, distinguished by its custom inductors that form the cornerstone of its sonic character. This meticulously designed section delivers the quintessential warmth and musicality associated with classic analog equalization, yet with a modern twist. The use of bespoke inductors allows for exceptionally smooth and natural sounding adjustments across the frequency spectrum, enabling users to sculpt the audio with precision without ever compromising on quality. Whether gently sweetening the highs or carefully carving out the lows, the passive EQ section offers unparalleled control, making it a key feature that defines the unit's unique sound. Its integration into the signal path is a testament to the commitment to audio excellence, combining traditional analog virtues with contemporary design for an unmatched sonic experience.

Each EQ band in the unit is designed with a rich set of features to offer unparalleled flexibility and precision in sound shaping:

- **Q Factor Variability:** Users have the choice between Proportional Q and Constant Q modes, each with adjustable Q values. This allows for dynamic control over the bandwidth of the EQ curve, providing either consistent or gain-dependent bandwidth as required.
- **Gain Range Flexibility:**
    - In Constant Q mode, the gain can be adjusted within a range of -15dB to +15dB, or a more restrained range of -5dB to +5dB, depending on the selected Gain Mode. This offers versatility in how subtle or pronounced the EQ adjustments can be.

    - Proportional Q mode introduces a gain range that varies according to the Q setting, allowing the bandwidth to become narrower with higher gain settings for more focused adjustments.

- **Independent Band Bypass:** Each EQ band can be bypassed individually, enabling users to isolate the impact of specific adjustments or compare before and after states with ease.
- **Bell or Shelf Modes:** All bands in this EQ can function in either Bell or Shelf modes, providing comprehensive flexibility for various EQ applications, from detailed midrange sculpting to broad adjustments at the frequency spectrum's edges. **Note that while Proportional Q and Constant Q settings influence the Bell mode's response, they do not affect the Shelf curve, ensuring targeted precision or expansive tonal shaping as required.**
- **Q Settings for Bell Mode:**
    - For Constant Q, the Q value starts at 0.5, offering the widest bandwidth for gentle, broad adjustments, and goes up to 4.0 for tighter, more focused shaping.
    - For Proportional Q, the Q's responsiveness to gain adjustments means its bandwidth varies dynamically.

This architecture ensures that each band is not just a tool for frequency adjustment but a versatile instrument capable of nuanced sound manipulation, making the unit an indispensable component of any audio processing setup.

Please note that while the specifications for Q factors, gain ranges, and other parameters are provided with precision, the actual values may exhibit slight variations. This is a characteristic trait of the analog components, especially custom inductors, used in the passive EQ section. Different configurations of inductors and the natural anomalies inherent in analog circuitry contribute to these variations. Such discrepancies are normal and contribute to the unique sonic character of each unit. They underscore the organic nature of analog equipment, where each piece can offer a slightly different experience due to these subtle variations. This adds to the unit's charm, ensuring that while it delivers consistent performance, it also provides a touch of individuality in its sound shaping capabilities.

The filter bands on this device are meticulously designed to provide a comprehensive range of frequency adjustments across the audio spectrum, allowing for precise and creative shaping of sound. Each band is equipped with 12 selectable frequency points and can operate in specific modes tailored to their frequency ranges:

- **Low Band:** Ranges from 22Hz to 1kHz, offering the flexibility to sculpt the bass frequencies. It can operate in either Bell mode for targeted frequency boosts or cuts, or Low Shelf mode for broader adjustments below the chosen frequency point, affecting the very foundation of the sound.
- **Low-Mid Band:** Covers frequencies from 90Hz to 4.8kHz, bridging the gap between the low and midrange spectrums. This band can also work in Bell or Low Shelf mode, providing versatility in addressing the lower midrange—essential for the warmth and body of many instruments.

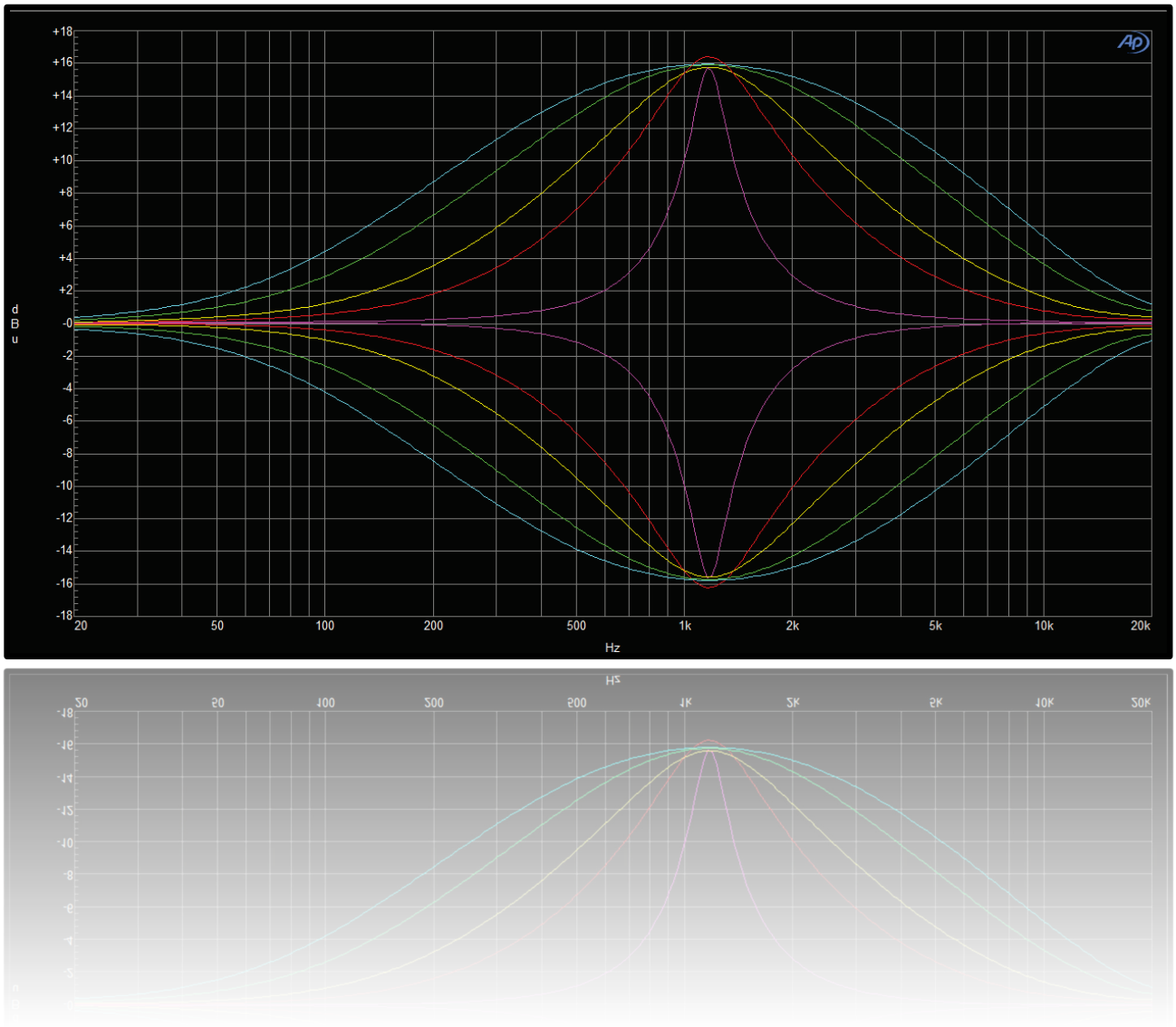
- **High-Mid Band:** Extends from 260Hz to 11kHz, targeting the crucial mid to upper-midrange frequencies. It can operate in Bell or High Shelf mode, allowing for nuanced adjustments or broader enhancement/cutting of the high mids, crucial for vocal presence and instrumental clarity.
- **High Band:** Spans from 600Hz to 28kHz, enabling high-frequency shaping. This band is capable of working in Bell or High Shelf mode, perfect for adding air, sparkle, or taming harshness in the upper frequencies, thereby affecting the overall brightness and detail of the sound.

Each band's ability to switch between Bell and Shelf modes (Low Shelf for the Low and Low-Mid bands, High Shelf for the High-Mid and High bands) adds a layer of flexibility, enabling both precise correction and creative tone shaping across the audio spectrum.

3.2.4. Passive Equalization Section – Curves

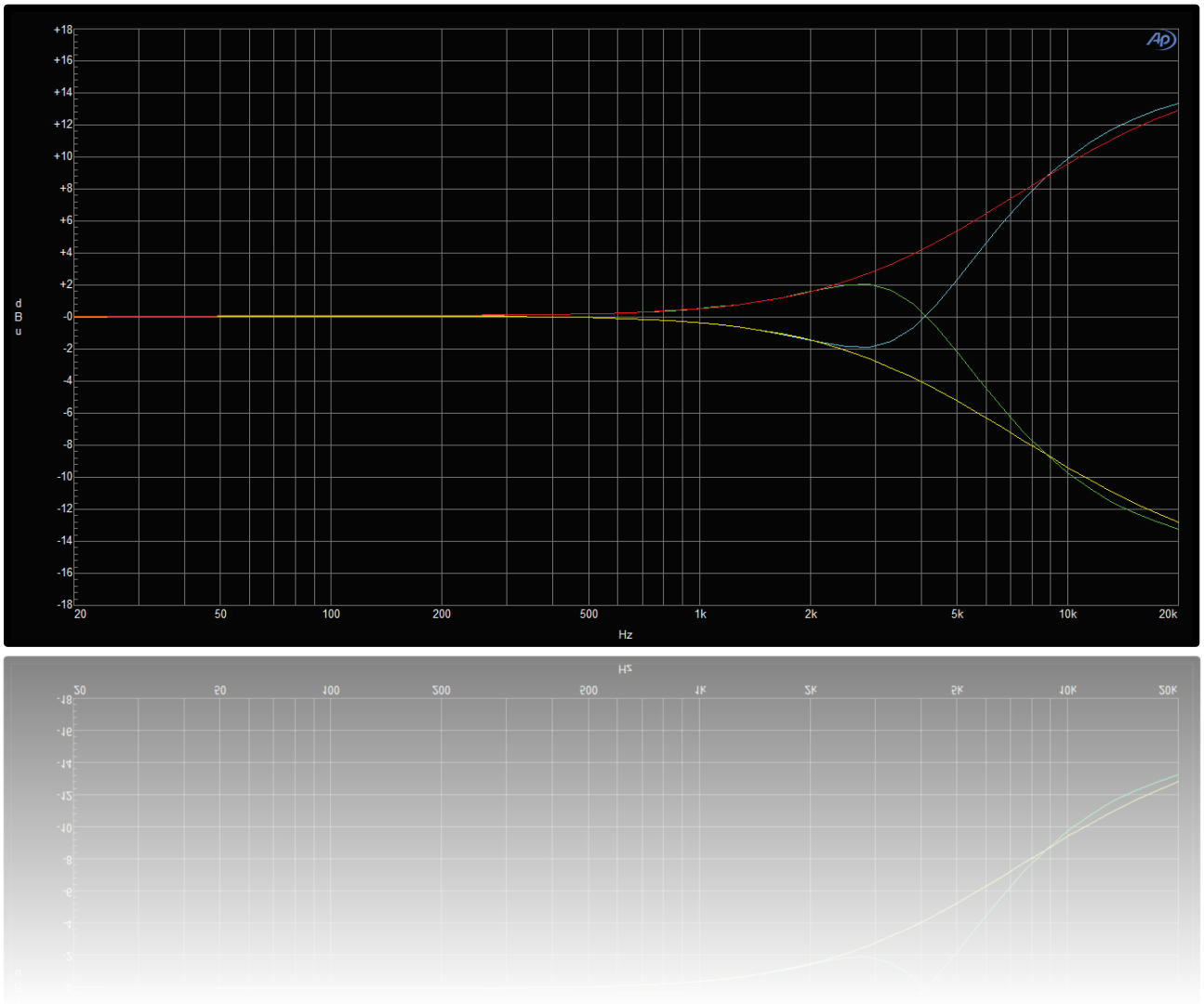
Low-Mid Band | 1.2kHz BELL | +/-15dB | Q Min to Max

The graph, illustrating filter responses at maximum and minimum gain levels (+/-15dB) across various Q settings from minimum to maximum and in Constant Q mode, specifically represents the behavior at a 1.2kHz frequency for the Low-Mid Frequency (LMF) band. This detail highlights the graph's focus on demonstrating how the EQ manipulates this particular midrange frequency with different gain and Q parameters.



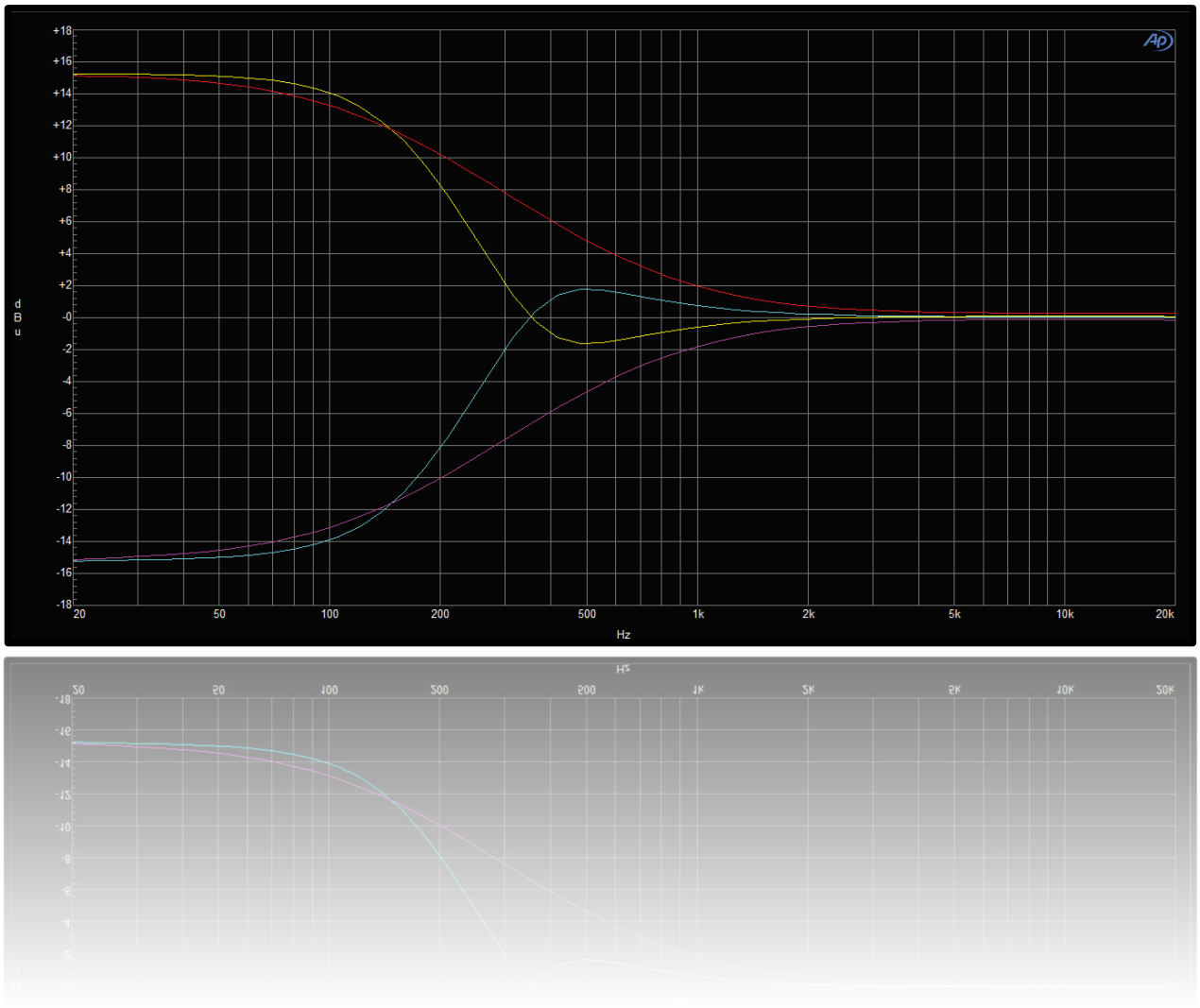
High Band | 10kHz SHELF | +/-15dB | Q Min to Max

The graph showcases the High Band's response at a 10kHz frequency in Shelf mode, with gain settings ranging from +/-15dB. It further details the impact of adjusting the Q value from minimum to maximum, offering a visual representation of how these adjustments influence the shape and extent of the EQ curve in this high-frequency range. This graph is essential for understanding the flexibility and precision available when shaping the high-end frequencies of audio material.



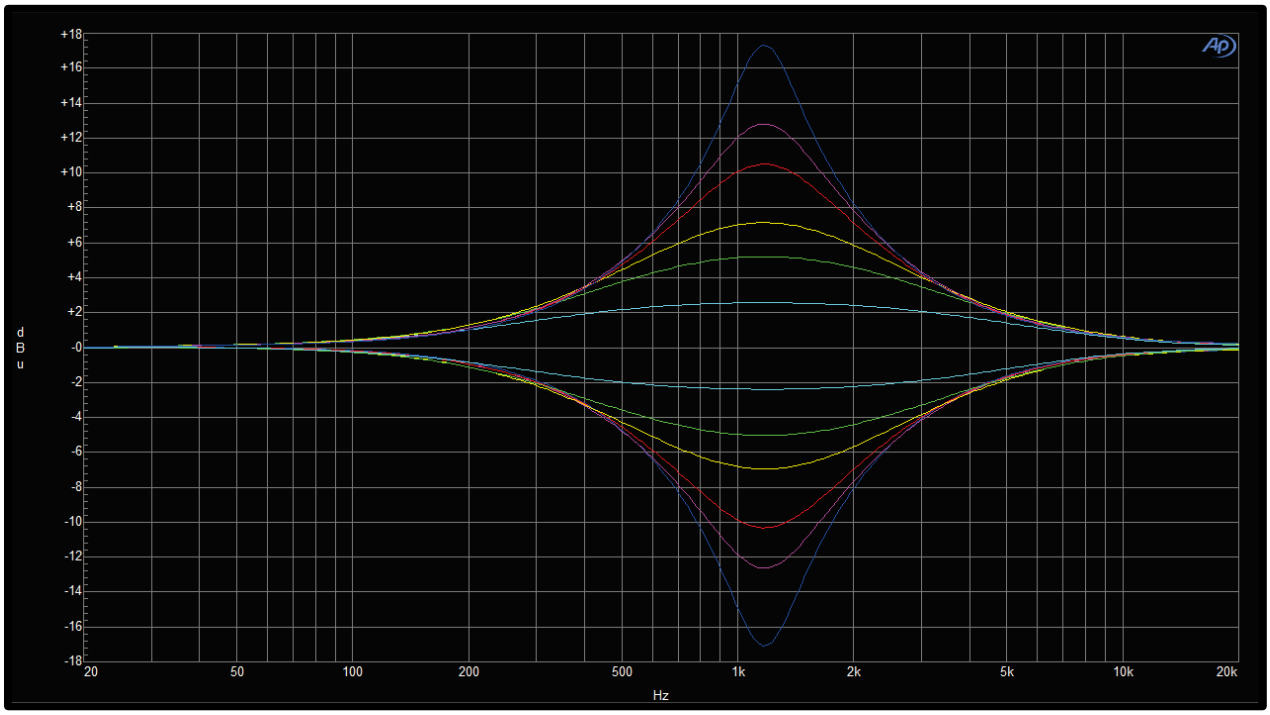
Low Band | 150Hz SHELF | +/-15dB | Q Min to Max

The described graph illustrates the Low Band's response at a 150Hz frequency, set in Shelf mode, with adjustments ranging from +/-15dB in gain. It also explores the effects of altering the Q value from its minimum to maximum settings. This visual aids in comprehending how different Q settings modify the shelf curve's slope and overall impact on the sound, particularly in the low-frequency range. This detailed representation is crucial for users looking to make precise adjustments to the bass content of their audio material, offering insights into the EQ's capability to subtly or significantly shape low-end frequencies.



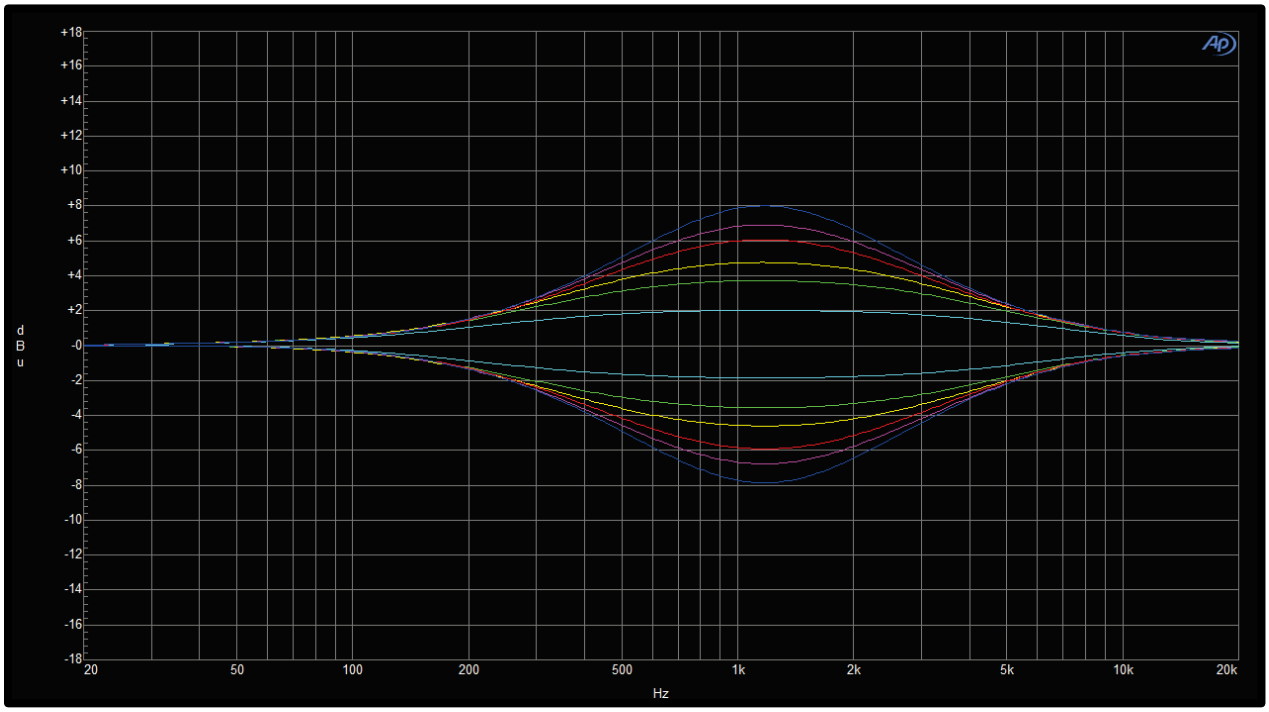
Low-Mid Band | 1.2kHz BELL | GAIN Min To Max in 2.5dB step | Q Narrow

The graph represents the Low-Mid Band's performance at 1.2kHz, configured in Bell mode, with gain adjustments made from the minimum to the maximum in 2.5dB steps, all while employing a narrow Q setting. This visualization serves to demonstrate the nuanced impact of incremental gain changes on the EQ curve at a midrange frequency, showcasing the precision and control available when shaping the sound with a focused bandwidth. This detail is particularly valuable for fine-tuning midrange frequencies, emphasizing or attenuating specific tones with great accuracy.



Low-Mid Band | 1.2kHz BELL | GAIN Min To Max in 2.5dB step | Q Wide

The graph depicts the response of the Low-Mid Band at 1.2kHz in Bell mode, with gain adjustments spanning from minimum to maximum in 2.5dB increments, under a wide Q setting. This illustration highlights how the broad bandwidth affects the EQ's influence over a wider range of frequencies around the central 1.2kHz point, with each step-in gain demonstrating the capacity for both subtle and significant alterations in sound. This wide Q setting is especially useful for more extensive tonal shaping within the midrange, offering insights into the EQ's ability to smoothly blend or significantly alter midrange content.



3.2.5. High Pass Filter (HPF)

The high-pass filter (HPF), positioned after the passive EQ section, incorporates a suite of features enhancing the unit's flexibility and sonic integrity:

- **Bypass Options:** The HPF can be completely bypassed through several methods, ensuring seamless integration into any signal path. This can be achieved by holding the HPF knob pressed for 2 seconds, rotating the encoder to the far-left position, or utilizing the controls within the accompanying DAW plugin. Such versatility allows for quick and intuitive operation, fitting the workflow of any session.
- **Analog Bypass Circuitry:** The bypass function is executed in the analog domain using an analog switch. When bypassed, the active section is completely disengaged, preserving the purity of the signal. This feature ensures that the signal path remains uncolored when the HPF is not in use, maintaining the unit's commitment to audio fidelity.
- **Selectable Slopes:** The HPF offers two slope settings—12dB per octave and 24dB per octave. This selection allows for precise control over the attenuation of low frequencies, accommodating everything from subtle high-pass filtering to more aggressive low-end roll-off. The slope can be switched by pressing the HPF encoder or remotely via the DAW plugin, providing flexibility in shaping the frequency response of the audio material.

These features highlight the HPF's role not just as a filtering tool but as a sophisticated component of the unit's overall design, offering nuanced control over the audio signal with the utmost respect for signal integrity.

HPF starts at 12Hz and goes up to 300 Hz providing ~80 steps in analog domain in logarithmic scale.

3.2.6. Low Pass Filter (LPF)

The high-pass filter (LPF), positioned after the passive EQ section, incorporates a suite of features enhancing the unit's flexibility and sonic integrity:

- **Bypass Options:** The LPF can be completely bypassed through several methods, ensuring seamless integration into any signal path. This can be achieved by holding the LPF knob pressed for 2 seconds, rotating the encoder to the far-right position, or utilizing the controls within the accompanying DAW plugin. Such versatility allows for quick and intuitive operation, fitting the workflow of any session.
- **Analog Bypass Circuitry:** The bypass function is executed in the analog domain using an analog switch. When bypassed, the active section is completely disengaged, preserving the purity of the signal. This feature ensures that the signal path remains uncolored when the LPF is not in use, maintaining the unit's commitment to audio fidelity.
- **Selectable Slopes:** The LPF offers two slope settings—12dB per octave and 24dB per octave. This selection allows for precise control over the attenuation of low frequencies, accommodating

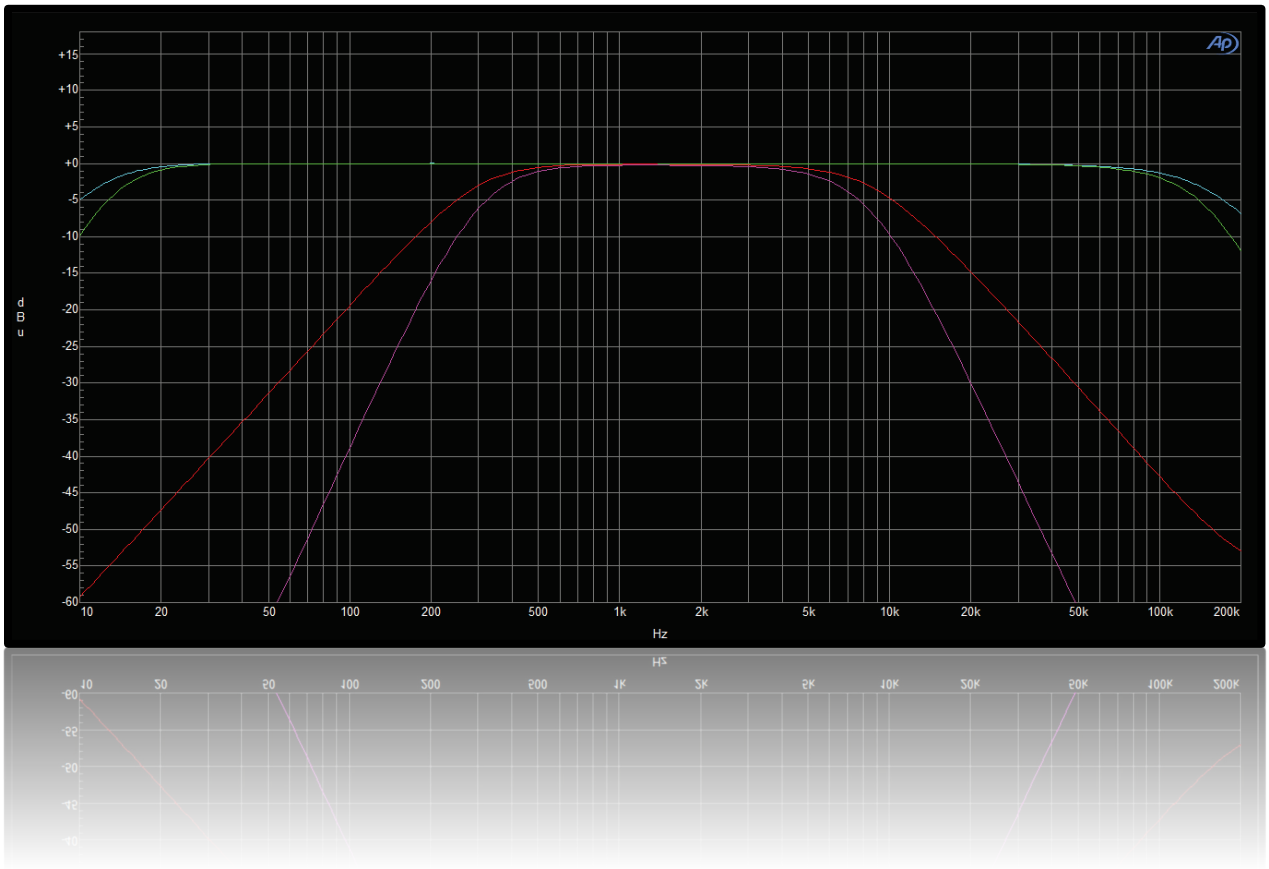
everything from subtle high-pass filtering to more aggressive low-end roll-off. The slope can be switched by pressing the LPF encoder or remotely via the DAW plugin, providing flexibility in shaping the frequency response of the audio material.

These features highlight the LPF 's role not just as a filtering tool but as a sophisticated component of the unit's overall design, offering nuanced control over the audio signal with the utmost respect for signal integrity.

LPF starts at 50kHz and goes up to 6kHz providing ~80 steps in analog domain in logarithmic scale.

3.2.7. Low Pass Filter (LPF) & High Pass Filter (HPF) Curves

This graph illustrates the response curves of the High Pass Filter (HPF) and Low Pass Filter (LPF) at their minimum and maximum settings. For the HPF, the curve at the minimum setting represents the lowest frequency point at which the filter begins to attenuate low-frequency signals, gradually increasing in steepness as it moves to the maximum setting, where it cuts off higher frequencies more aggressively. Conversely, the LPF curve starts at a higher frequency at its minimum setting, showing a gentle slope that progressively attenuates high-frequency signals. As the setting shifts to maximum, the curve lowers, indicating the filter's cutoff point is moving down to lower frequencies, thereby reducing the range of high frequencies passing through more sharply. Together, these curves visually depict how each filter behaves and impacts the audio signal at various settings, highlighting the filters' flexibility in shaping the frequency content of the audio signal.



3.2.8. OUTPUT Modes

The ngTubeEQ is designed with two distinct output stages, each offering a unique character and signal path to suit different audio engineering needs and preferences. These stages are color-coded for ease of reference and operation: GREEN for an electronically balanced output and RED for a tube amplification stage followed by transformer symmetrization and a passive attenuation circuit. Here's a more detailed look at each:

1) GREEN Output Stage: Electronically Balanced

The GREEN output stage provides an electronically balanced signal path. This stage is characterized by its clean, transparent sound. It maintains the integrity of the audio signal with minimal coloration, ensuring a pure, unaltered output. This setting is ideal for applications requiring pristine sound quality and accuracy, making it suitable for critical listening environments and scenarios where the natural sound of the source material needs to be preserved.

2) RED Output Stage: Tube Amplification with Transformer Symmetrization and IRON PAD

The RED output stage introduces a more complex and character-rich signal path:

- **Tube Amplification Stage:** This initial stage of the RED path adds the harmonic richness and warmth often associated with tube circuits. The tube amplification can introduce subtle to noticeable saturation effects, depending on how hard the stage is driven, adding depth and character to the audio signal.
- **Transformer Symmetrization:** Following the tube stage, the signal passes through a transformer symmetrization circuit. Transformers are known for their ability to add weight and warmth to the signal, further enhancing the output's sonic character. This stage also contributes to the overall tonal balance and can induce subtle nonlinearities that enrich the sound.
- **Passive Attenuation Circuit (IRON PAD):** The final stage in the RED output path involves a passive attenuation circuit, known as the IRON PAD. This circuit consists of a set of resistors controlled via a relay cascade, allowing for attenuation ranging from 0 to 15dB. The IRON PAD enables the user to aggressively drive the tube and transformer stages for increased saturation and character while still having the ability to dial back the output level. This ensures that the subsequent stages in the signal chain are not overloaded, providing control over the signal's dynamic range without compromising on the desired tonal character.

Together, these stages offer the ngTubeEQ user a flexible and creative toolkit for shaping audio signals, whether the aim is to maintain the utmost fidelity to the source or to imbue the signal with the distinctive warmth and richness that only tubes and transformers can provide.

3.3. Analog Features

3.3.1. Constant Q vs Proportional Q

In the chapter discussing Proportional Q versus Constant Q, it's essential to clarify the distinctions between these two modes of operation and to highlight the innovative implementation of a Constant Q passive circuit that functions alongside Variable Q in the ngTubeEQ. Here's a detailed explanation suitable for inclusion in your manual:

Understanding Proportional Q and Constant Q

Proportional Q and **Constant Q** represent two different methodologies for how the bandwidth, or Q factor, of an EQ band responds as the gain is adjusted. Understanding the difference between these modes is crucial for effectively utilizing an EQ in various mixing and mastering scenarios.

In **Proportional Q** mode, the bandwidth of the EQ band narrows as the gain is increased (either boost or cut) and widens when the gain is decreased. This dynamic change in bandwidth allows for precise targeting of frequencies only at higher gain settings, making it ideal for surgical adjustments, such as removing problematic frequencies or enhancing specific tonal characteristics. As the gain is reduced, the broader bandwidth affects a wider range of frequencies, useful for gentle shaping and blending of the sound.

Conversely, **Constant Q** maintains a consistent bandwidth regardless of the gain setting. This consistency ensures that the range of frequencies affected by the EQ remains unchanged as you adjust the gain, providing predictable and stable EQ adjustments. Constant Q is particularly valuable for tasks requiring consistent tonal shaping across various gain settings, ensuring a uniform impact on the sound.

Implementing Constant Q in a Passive Circuit with Variable Q

A significant achievement of the ngTubeEQ is the integration of a **Constant Q passive circuit** that operates seamlessly with **Variable Q** functionality. This innovative design allows users to switch between Proportional and Constant Q modes, depending on the needs of the session, without compromising the integrity and musicality of the EQ's passive circuitry.

- **Innovation:** The ability to offer Constant Q within a traditionally passive EQ design is a notable advancement, overcoming the typical limitations of passive circuits which naturally exhibit variable Q characteristics. This ensures that the ngTubeEQ provides the engineer with the best of both worlds—the musical and warm characteristics of a passive EQ with the precision and consistency of Constant Q.
- **Flexibility:** By enabling Constant Q in a passive EQ circuit, the ngTubeEQ extends its versatility, allowing for both broad tonal shaping and precise frequency adjustments within a single unit. This

feature emphasizes the EQ's capability to adapt to varying mixing and mastering demands, from subtle frequency enhancements to focused corrections.

- **User Control:** The inclusion of Variable Q alongside Constant Q empowers users to tailor their approach to EQing based on the material, desired outcome, and personal preference. Whether seeking the dynamic responsiveness of Proportional Q or the stability of Constant Q, the ngTubeEQ accommodates a wide range of artistic and technical EQ applications.

  This combination of Proportional and Constant Q modes, particularly within a passive circuit design, exemplifies the ngTubeEQ's innovative approach to analog EQing, providing unparalleled control and musicality to the user.

3.3.2. Listen Mode – Band Focus Feature

The "Listen Mode" or "Band Focus Feature" represents a groundbreaking advancement in analog EQ design, specifically engineered to enhance the user's interaction with the ngTubeEQ. This feature allows users to isolate and focus on a particular frequency point by employing High-Pass Filter (HPF) and Low-Pass Filter (LPF) around the selected frequency. This innovative functionality is likely unique to the ngTubeEQ, marking a significant achievement in the realm of analog audio processing equipment.

How Listen Mode Works

When activated, Listen Mode engages both HPF and LPF to narrow down the audible range to a specific bandwidth centered around the selected frequency. This focused listening allows the user to hear how adjustments affect the targeted frequency in isolation, making it easier to identify and rectify issues or to enhance desired tonal characteristics without the distraction of the full frequency spectrum.

- **HPF and LPF Coordination:** By smartly adjusting the cutoff points of both the HPF and LPF, Listen Mode creates a "band of focus" that isolates the chosen frequency. This isolation helps in pinpointing resonances, identifying problematic frequencies, or simply understanding the character of the frequency point better.
- **Analog Innovation:** Integrating such a feature within an analog EQ circuitry showcases significant technical ingenuity. It requires careful design to ensure that the feature does not compromise the integrity and musicality of the analog signal path while providing a genuinely useful tool for sound engineers.
- **Practical Applications:** Listen Mode is particularly useful in mixing and mastering environments where critical listening and precise frequency adjustments are paramount. It allows engineers to make more informed decisions about EQ adjustments, ensuring that every change contributes positively to the overall mix.

Bringing the Listen Mode feature to an analog EQ unit like the ngTubeEQ represents not just a technical achievement but a substantial enhancement of the analog EQ user experience. It exemplifies how innovative design can merge the beloved characteristics of analog audio equipment with the precision and functionality demanded by modern production workflows.

Influence of Q Setting on Listen Mode

Listen Mode's effectiveness and focus are subtly influenced by the Q setting of the selected band. When a band's Q is narrow, Listen Mode reflects this precision by narrowing its auditory focus, providing a tighter isolation of the selected frequency point. Conversely, a wider Q setting results in a broader auditory focus, allowing a slightly larger frequency range around the target point to be audible. This dynamic adjustment ensures that Listen Mode can adapt to the user's specific needs, offering either pinpoint focus or a more general frequency area overview, based on the Q setting's precision or breadth.

Activation Flexibility

The Listen Mode feature is designed for easy activation, both from the accompanying plugin and directly from the hardware unit. Engaging this mode involves pushing the THD knob and then selecting the desired frequency by touching the corresponding frequency knob. This dual-method activation offers users flexibility in how they interact with the ngTubeEQ, accommodating different workflow preferences and ensuring that Listen Mode is readily accessible in various working environments.

Behavior in Dual and MS Modes

The operation of Listen Mode takes on additional dimensions in Dual and MS (Mid-Side) modes, particularly concerning how it interacts with the Parameter Link function:

3.3.3. Iron Link

Another innovative feature of the ngTubeEQ is the ability to link the IRON PAD with the OUTPUT control in **IRON** mode through a dedicated GUI control. This functionality enhances the user's ability to sculpt the sound by managing the unit's gain staging with precision, allowing for creative saturation and distortion effects while maintaining unity gain.

How the Link Feature Works

When engaged, this link ensures that adjustments made to the OUTPUT level are mirrored by corresponding adjustments in the IRON PAD attenuation. This clever design allows users to drive the tube amplification stage and transformer more aggressively for increased saturation or even harmonic distortion, without altering the overall output level of the signal. Essentially, you can achieve a hotter, more saturated signal from the tube and transformer stages without increasing the output volume, preserving the mix's balance.

Creative Applications

This feature is particularly valuable in scenarios where an engineer seeks to enhance the character and texture of a track or mix without changing its position in the overall mix level. By driving the signal harder into the tube amplification and transformer stages, users can extract the musical warmth, richness, and even the grittiness of tube saturation and transformer coloration, all while keeping the output level consistent.

3.3.4. Gain Modes

The ngTubeEQ features a dual gain mode setting that allows for precision and flexibility in sound sculpting. These modes, catering to different levels of sensitivity and resolution in adjustments, highlight the unit's adaptability to various mixing and mastering requirements.

Gain Modes and Steps

- **+/-15dB Mode:** This setting is designed for broader stroke adjustments, with each step of change equating to approximately 0.25dB. It's suited for significant alterations in the sound, allowing for quick and impactful modifications across the frequency spectrum.
- **+/-5dB Mode:** In contrast, this mode offers finer resolution for adjustments, with each step corresponding to around 0.083dB. This higher resolution is ideal for detailed, nuanced tweaks where subtlety and precision are paramount.

Constant Q vs. Proportional Q Gain Steps

- **Constant Q Mode:** The gain steps mentioned above are measured in Constant Q mode, where the bandwidth of the EQ band remains constant regardless of the gain setting. This mode ensures predictable and uniform adjustments across the spectrum, making it easier to apply precise changes.
- **Proportional Q Mode:** In Proportional Q mode, the gain steps become more variable due to the bandwidth of the EQ band changing in response to the gain adjustment. The relationship between gain and Q means that tighter Q settings might be in a similar ballpark to the specified steps, but the nature of Proportional Q makes it challenging to define exact gain steps. As the Q narrows, the impact of each adjustment can feel more pronounced, although the exact step size may vary.

Gain Step Analog Impact

The ngTubeEQ's passive design, rooted in inductor-based circuits, presents unique challenges in maintaining absolute accuracy with gain steps. Due to the inherent characteristics of passive designs:

- **Variable Gain Steps:** Some steps may slightly deviate, and certain frequency points could exceed 15dB in the 15dB mode, attributed to resolution limitations. Nonetheless, variations are expected to remain within a safe range.
- **Frequency Point Fluctuations:** The analog nature of the design might cause some frequency points to potentially reach beyond the intended 15dB gain due to the physical limitations of passive components.
- **Q Setting Influence:** Specific Q settings can introduce variability in gain values, possibly fluctuating by +/-0.5dB. This variation is a natural aspect of passive EQ designs, where the interaction between inductors and capacitors can lead to slight inconsistencies.

The software is designed to compensate for many of these effects, ensuring the most accurate reproduction of the intended settings. However, some minor discrepancies may still occur, reflecting the unique character and warmth of analog circuitry.

This nuanced approach to EQ adjustments, with variable gain steps influenced by the selected Q mode, underscores the ngTubeEQ's sophisticated design. It allows audio professionals to tailor their use of the EQ to the task at hand, whether requiring broad adjustments for shaping the overall tone or precise tweaks for addressing specific sonic elements.

4. Software Setup

The WesAudio software package is accessible for download to all purchasers of the corresponding hardware unit at https://www.wesaudio.com/download .

For information on supported plugin types and platforms, please refer to the provided link.

4.1. Installation Process

To initiate the installation of the WesAudio software package, navigate to http://www.wesaudio.com/download and download the latest version of the software.

4.1.1. For Windows Users

- **Initial Installation**: Before beginning the installation, ensure that all WesAudio devices are disconnected from your computer.
- **USB Driver Installation**: Upon installing the USB driver, a notification will prompt you to connect all WesAudio devices. Please connect the devices as instructed.
- **Computer Restart Request**: Installation of the USB driver may necessitate restarting your computer. Although restarting is generally inconvenient, it is a crucial step to ensure successful installation of the USB driver.
- **Post-Restart**: After restarting, the installer should automatically resume. If the installer does not restart on its own, please manually reopen the same installer to continue the process.

4.1.2. For OSX Users

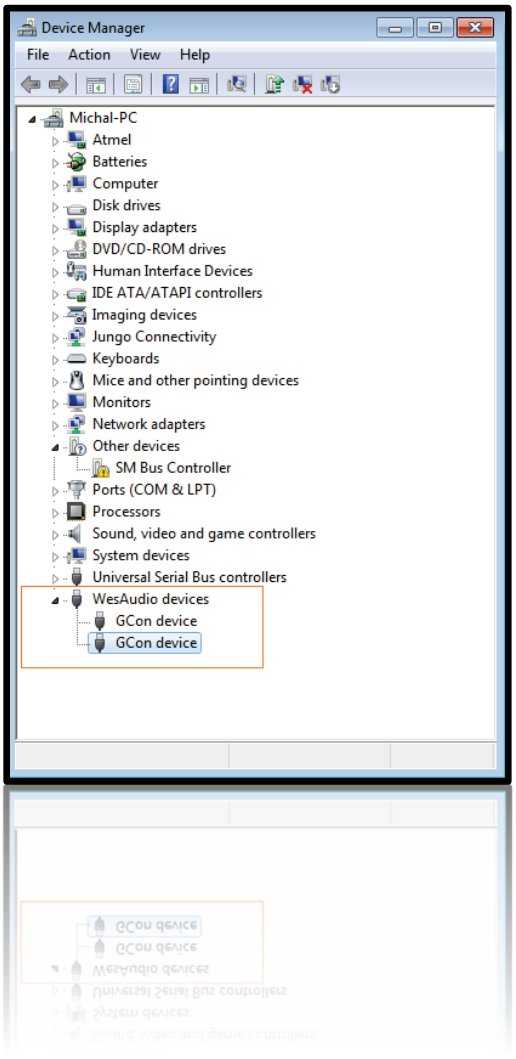
Due to the simpler nature of OSX architecture and its handling of USB devices, the primary consideration is to ensure all devices are connected before beginning the installation process. Once you initiate the installer application, you might encounter system warnings regarding the installer. In such cases, please disregard these warnings*. If necessary, you can bypass these warnings by accessing the context menu through an 'Option' click (or right mouse click) and initiating the installation process again.

4.1.3. Troubleshooting

If you encounter any issues during the installation process, please reach out to our support team at support@wesaudio.com, and we will respond promptly to assist you.

Below is a common issue along with suggestions that might help in diagnosing the problem:

- Issue: "Can't find my device in the plugin dropdown menu"
    - This problem can stem from multiple causes. On Windows, a critical step is to verify that the USB device is successfully recognized at the system level. You can check this in the "Control Panel -> System -> Device Manager."
    - **Important for Windows Users:** Installing the USB driver is essential for the hardware units to communicate with the software. This step is mandatory only during the initial installation. The driver installation option will be automatically disabled for any subsequent software updates.



4.2. GCon Manager

The GCon Manager is a versatile application designed for configuration management across compatible devices. It is located within the Application folder data:

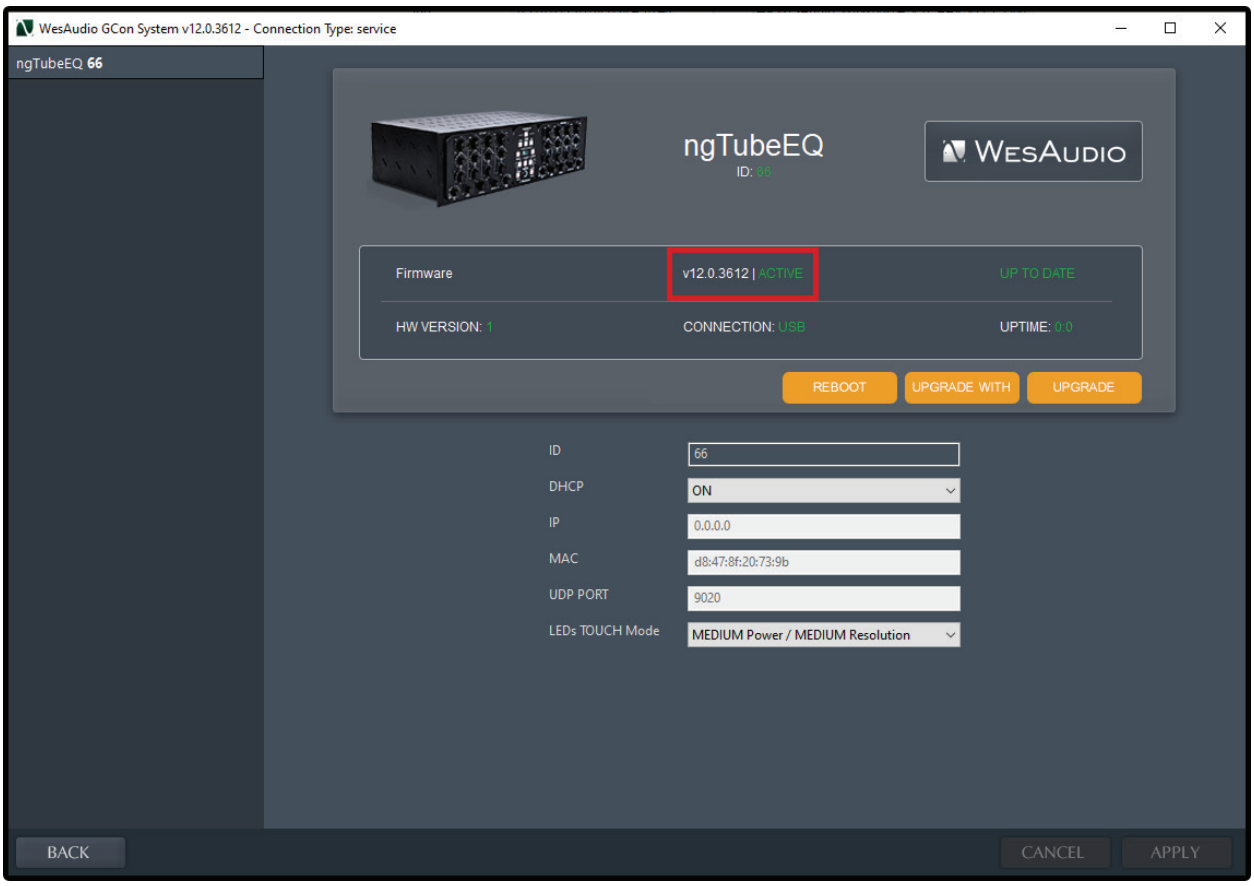
- **For OSX:** Access it at "/Applications/WesAudio/GConManager."
- **For WINDOWS:** Find it in the folder chosen during the installation phase, typically "c:/Program Files x86/WesAudio/GConManager.exe" by default.

Main Features:

- **Firmware Updates:** Easily upgrade your device's firmware to the latest version.
- **Configuration Settings:** Modify unit settings, such as IP address configuration, to suit your needs.
- **Diagnostics:** Run diagnostic tests to ensure your unit is functioning correctly.
- **External Controller Setup:** Configure external controllers, for instance, for the ngLeveler.
- **Standalone Operation:** Control units directly without the need for a DAW (Digital Audio Workstation)."

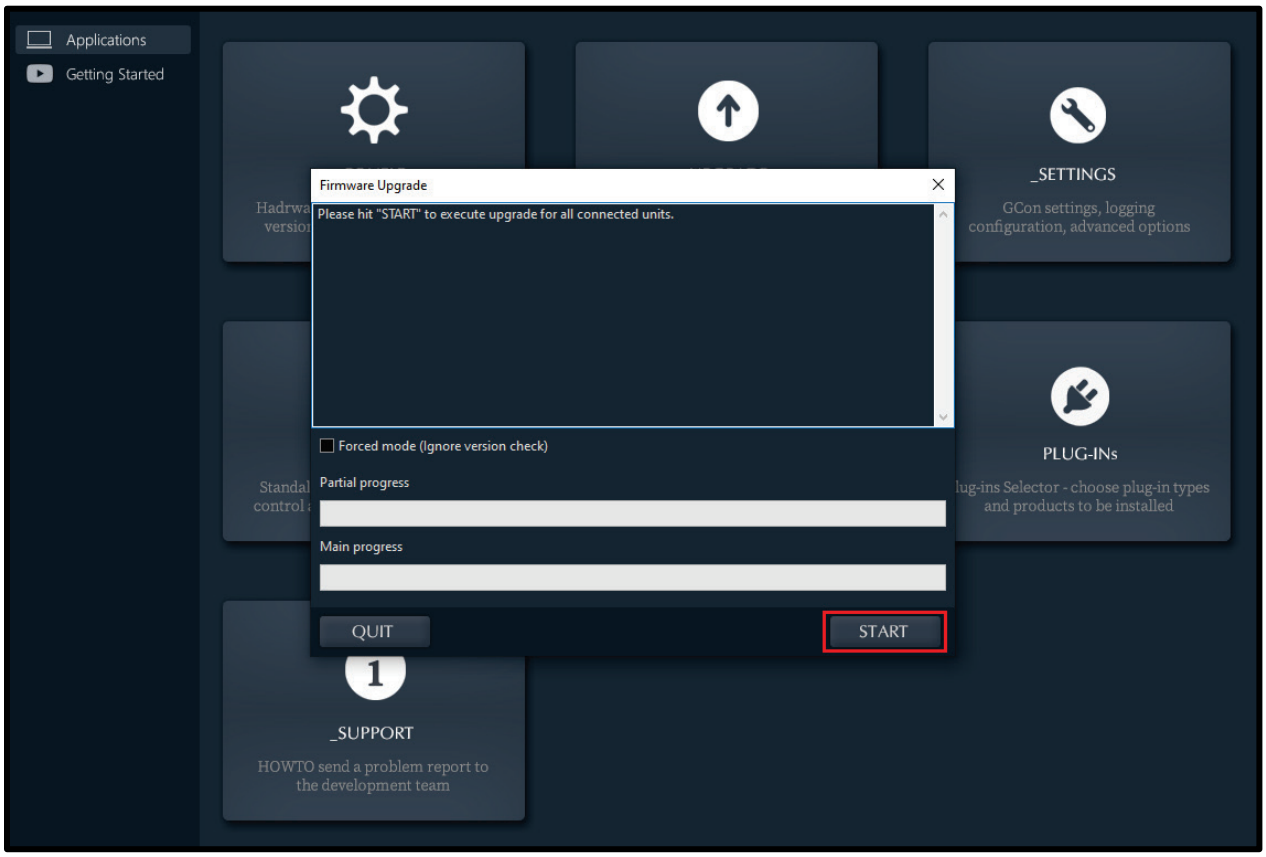
4.3. How to check Firmware version

Each device communicates its firmware version to your workstation, establishing compatibility between your host application and the connected device. To verify or perform a firmware upgrade, please use the GConManager _CONFIG application. Additionally, the firmware version is displayed on the device's LCD screen immediately upon startup.



4.4. How to perform firmware upgrade

To update the firmware, navigate to the GConManager UPGRADE section and press the “Start” button. This initiates the update process for any modules that are not currently aligned with the latest version of your host software.



4.5. Set up GCon Connection

This chapter outlines potential setup configurations and details the primary steps for configuration.

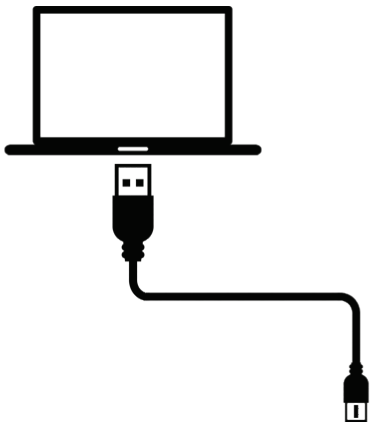
It's important to recognize that audio signals should be transmitted through XLR connectors. The USB and Ethernet ports are designed solely for managing unit configurations using the GCon Protocol.

Broadly speaking, the ngTubeEQ supports two types of connections:

- **USB 2.0** or higher.
- **Ethernet 10/100**, utilizing the UDP protocol for LAN within a single subnet.

4.5.1. USB

To directly link your ngBusComp unit to your workstation, simply use a USB cable to connect it to any available USB 2.0+ port on your computer.

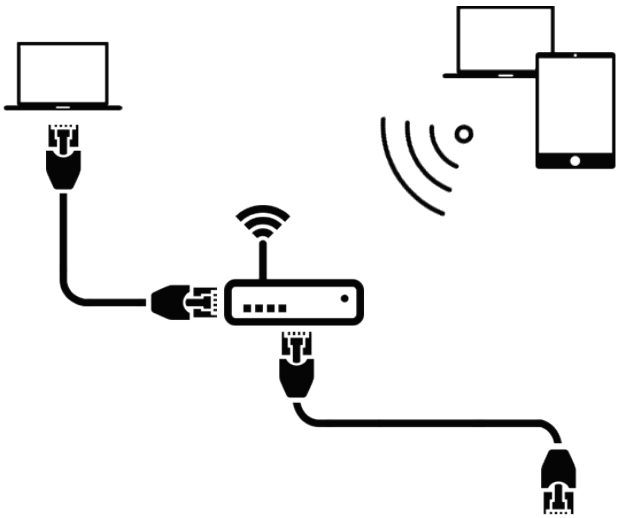


4.5.2. Ethernet

The ngTubeEQ, like any network-enabled device, offers flexibility in connectivity to your workstation through the following methods:

- **Local Area Network (LAN) Connection:** By integrating the ngTubeEQ into your LAN, it becomes accessible from various devices within the network, allowing for versatile placement and usage within your studio environment.
- **Direct Workstation Connection:** For a straightforward setup, the ngTubeEQ can be directly connected to your workstation. This method is ideal for simple, one-to-one configurations without the complexity of a network.

In certain scenarios, it might be necessary to manually assign IP addresses to both your workstation and the ngTubeEQ to ensure proper communication and functionality. The following illustrates a typical setup within a local area network, showcasing how different devices can interact with and utilize the ngTubeEQ's features:



(*) In case you would like ngTubeEQ *to join already existing network, most probably your workstation has IP address already set up through static configuration entry, or through DHCP (by your router).*

4.5.2.1. Default network configuration via DHCP.

Each ngTubeEQ unit is set to utilize **DHCP by default**, making it straightforward to connect your ngBusComp to your router—simply plug it in, and you're good to go! If you're interested in altering this setup, the following next chapters will guide you through changing the configuration. To establish static IP addresses for your devices, you must undertake two key steps:

Disable DHCP: This ensures that your device does not automatically obtain an IP address from the network, allowing for manual configuration of a static IP address.

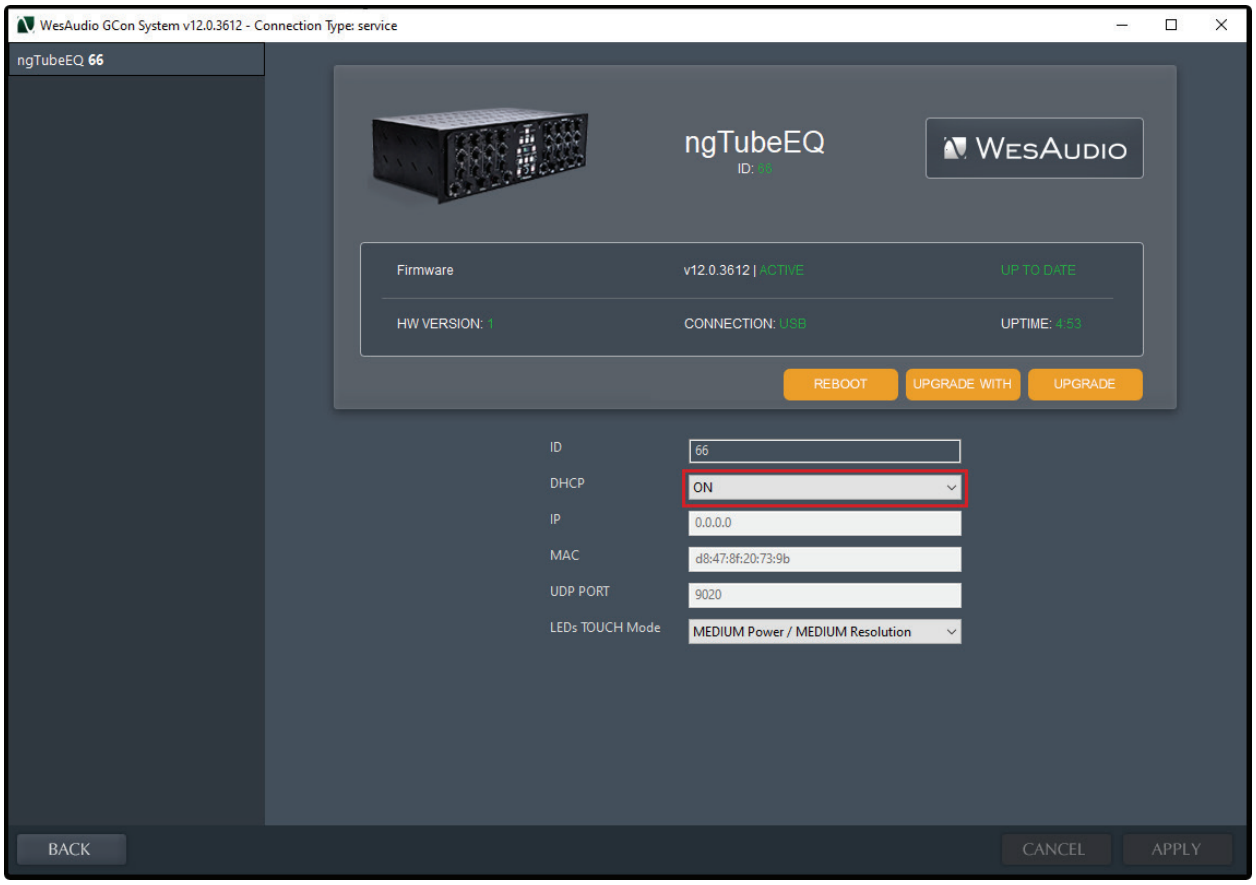
Configure a Static IP Address: Once DHCP is disabled, you can assign a specific, unchanging IP address to your device.

Detailed instructions for both procedures are provided in the subsequent chapters.

4.5.2.2. Enable/Disable DHCP

To toggle the DHCP setting on your ngTubeEQ unit to either enabled or disabled, follow these steps:

- **USB Connection:** Begin by connecting your ngTubeEQ directly to your workstation using a USB cable. This step is crucial because altering network configurations might result in a loss of connectivity with your device. A direct USB connection will remain as a fallback for reconfiguration.
- **Launch GConManager:** Open the GConManager software and proceed to the _CONFIG application.
- **Select Your Device:** Within GConManager, find and select your ngTubeEQ from the list displayed in the elements tree on the left side.
- **Adjust DHCP Setting:** Modify the DHCP option to match your requirements—either turning it "ON" for automatic IP address assignment or "OFF" for static IP configuration. Following this adjustment, the unit will undergo a restart, after which your connection to the ngBusComp should automatically re-establish.



Before transitioning from a USB connection to Ethernet, it's crucial to configure the appropriate IP address on your ngTubeEQ. This setup ensures seamless communication between the device and your network. The subsequent chapter will guide you through the process of establishing the correct IP settings.

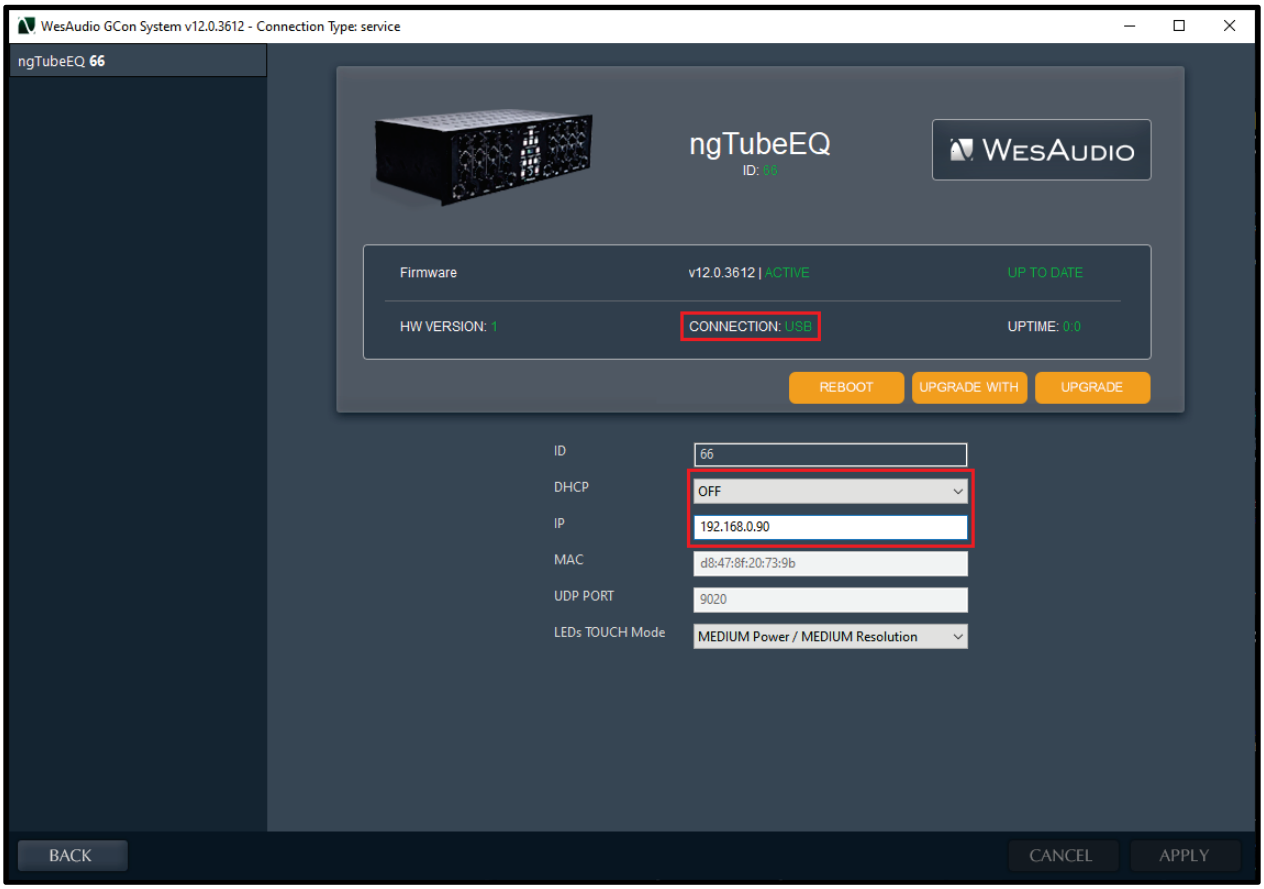
4.5.2.3. Set Up Static IP Address

There are a few situations where manually configuring the IP address for your ngTubeEQ might be necessary:

- **Non-DHCP Router:** If your router does not support DHCP, you will need to manually set the IP address to ensure the ngTubeEQ can connect to the network.
- **Manually Configured LAN:** For networks set up with manual configurations, such as through a hardware switch, your ngTubeEQ will require a manual IP setup to match the network's settings.
- **Direct Workstation Connection:** If you prefer to connect your ngTubeEQ directly to the Ethernet port on your workstation, a manual IP configuration is needed for the device to communicate effectively with your computer.

To configure the IP address for your ngTubeEQ, the process is similar to setting up other devices, with slight adjustments for device-specific steps. Here's how you do it:

- USB Connection: Initially, connect your ngTubeEQ directly to your workstation using a USB cable. (If you've already established a connection to the ngTubeEQ via an Ethernet cable and can access its settings, this step might not be necessary).
- Launch GConManager: Open the GConManager software on your computer and proceed to the "_CONFIG" application.
- Select Your Device: From the device list on the left side of the screen, select your ngTubeEQ unit.
- Adjust DHCP Settings: If the DHCP option is enabled ("ON"), change it to "OFF." This will necessitate a restart of the unit, after which the connection should automatically be re-established.
- Set the IP Address: Input the IP address you wish to assign to your ngTubeEQ in the provided field and press the 'Apply' button. The unit will undergo a restart to apply the new network settings. Once it powers back up, the connection with your ngTubeEQ will be re-established under the new IP configuration.
- After successfully configuring the IP address, you can now disconnect the USB cable from your ngTubeEQ and connect it to your network using an Ethernet cable. This will enable network-based communication and control according to the new settings you've applied.



4.5.3. Direct connection – setting IP address on PC/MAC.

Connecting your ngTubeEQ directly to a Mac or PC via Ethernet requires a few steps to ensure seamless communication. Here's a concise tutorial to guide you through the process:

For Both Mac and PC

Step 1: Prepare Your Equipment

- Ensure you have a standard Ethernet cable available.
- Your ngTubeEQ should be powered off before making any connections.

Step 2: Connect the Ethernet Cable

- Plug one end of the Ethernet cable into the Ethernet port on your ngTubeEQ.
- Connect the other end of the Ethernet cable to the Ethernet port on your Mac or PC.

For Mac

Step 3: Configure Network Settings

- Go to **System Preferences > Network**.
- Select the Ethernet connection from the list on the left. If it's not already configured, it may appear as a new connection with a green dot and say "Connected".
- Click on the "Advanced" button, then go to the TCP/IP tab.
- Configure the IPv4 setting to "Manually" or "Using DHCP with manual address", depending on your needs.
    - If selecting "Manually", enter the IP address that matches the network settings of your ngTubeEQ.
- Click "OK", then "Apply" to save your settings.

For PC (Windows 10/11)

Step 3: Configure Network Settings

- Go to **Settings > Network & Internet > Ethernet**.
- Click on your Ethernet connection.
- Scroll down and select **Edit** under IP assignment.
- In the Edit IP settings drop-down, choose "Manual".
- Enable "IPv4" by toggling it On, then fill in the IP address, Subnet mask, and Gateway based on your ngTubeEQ network settings.
- Click "Save" when done.

Final Step for Both Mac and PC

- Power on your ngTubeEQ.
- Ensure any necessary software or drivers for ngTubeEQ operation over Ethernet are installed on your computer.
- If required, adjust the ngTubeEQ's network settings to ensure they are compatible with your computer's network configuration. This might include setting a static IP address on the ngTubeEQ that is in the same subnet as your computer but outside your DHCP range to avoid IP conflicts.

You should now be able to communicate directly between your ngTubeEQ and computer via Ethernet, allowing for device management and control without a router or network switch.

5. Digital Control / Recall

This chapter delves into the comprehensive options available for managing ngTubeEQ and automating its settings. The cornerstone of ngTubeEQ's automation capabilities is its integration with Digital Audio Workstations (DAW) through a plugin, which is available in all common formats. This seamless convergence between hardware and digital software opens a wide array of creative possibilities and enhances workflow efficiency.

DAW Plugin Control:

DAW plugin control bridges the analog-digital divide, enabling users to manipulate hardware settings directly from their DAW. This fusion of the tactile and the virtual is not merely convenient but transformative, changing how producers and engineers interact with their gear.

Benefits of DAW Plugin Control:

- **Precision and Recall:** The ability to precisely recall settings for sessions is invaluable, ensuring mixes can be revisited or altered without the need to manually reconfigure the hardware. This feature is crucial for those working on multiple projects or needing to maintain consistency across sessions.
- **Automation Capabilities:** Integration with the DAW allows for the automation of every ngTubeEQ parameter within the digital environment. This feature provides dynamic changes in settings over time, infusing tracks with movement and vitality without manual intervention.
- **Workflow Efficiency:** Manually adjusting settings on hardware units can be cumbersome, particularly in complex setups. DAW plugin control simplifies this process, facilitating quick changes and A/B comparisons without physical interaction with the unit, thereby streamlining the production process.
- **Enhanced Creative Potential:** Merging the analog warmth with digital control flexibility broadens the creative spectrum, enabling real-time experimentation and the achievement of effects that might be challenging or impractical to accomplish on the hardware alone.
- **Accessibility:** DAW plugin control ensures full accessibility and adjustability of ngTubeEQ features from the workstation, a boon for those with spatial constraints or other limitations preventing direct access to their hardware.

In essence, ngTubeEQ's DAW plugin integration marries the rich, analog sound quality with the precision and versatility of digital control. This not only amplifies the functionality of ngTubeEQ but also elevates the music production process, offering unprecedented control and flexibility in a traditionally analog setup.

5.1. DAW Plug-in

The ngTubeEQ plug-in extends comprehensive control over all parameters of the unit, ensuring seamless integration into any digital audio workstation (DAW) environment. Designed to be versatile and accessible, it supports all common plug-in standards, including VST2, VST3, AU (Audio Units), and AAX, making it compatible with a wide range of software platforms.

The ngTubeEQ offers versatility through two types of plug-ins to accommodate various production needs:

- **Stereo Plug-in:** This variant provides comprehensive control over both channels of the hardware unit, enabling a wide range of operational modes including dual mono, stereo, and mid-side processing. It's ideal for cohesive processing of stereo tracks or linked dual mono operations, allowing for intricate spatial and tonal adjustments.
- **Mono Plug-in:** Designed for singular channel use, the mono plug-in connects to only one channel of the hardware unit, though two instances of the plug-in can be used concurrently with a single ngTubeEQ for true dual mono operation. This setup is perfect for treating separate mono sources independently—such as processing a kick drum on one channel and a snare drum on the other. In this configuration, each channel of the hardware operates as an independent mono unit, providing flexibility for targeted processing on individual tracks.

5.1.1. Stereo Plug-in – Dual and MS Modes

Analog Sound Digital Recall

The structure of the ngTubeEQ plug-in is meticulously designed to mirror the hardware unit's layout, offering a familiar and intuitive interface for users who are accustomed to the physical controls of the ngTubeEQ. This close mapping ensures a seamless transition between working with the hardware and the software, allowing users to apply their knowledge of the hardware's front panel functions directly to the plug-in environment.

For detailed explanations of each control and its functionality, users are encouraged to consult the chapter titled "Front Panel Functions." This section provides comprehensive insights into how to interact with the ngTubeEQ, whether you're adjusting parameters on the physical unit or via the plug-in.

1. **Undo:** The Undo feature in the ngTubeEQ plug-in allows users to revert to the previous state before the most recent adjustment was made. This function is essential for quickly correcting mistakes or reassessing changes without permanent consequences to the settings.
2. **Redo:** Following an Undo action, the Redo function permits users to reapply the last change that was undone. This feature ensures that no adjustment is final until the user is satisfied, providing an additional layer of flexibility in tweaking the settings.
3. **Previous Preset:** Loads the previous preset from preset database.
4. **Next Preset:** Loads the next preset from preset database.
5. **Preset Selector:** Allows for the selection, viewing, and deletion of presets.
6. **Preset Save:** Saves currently selected presets.
7. **Preset Save As:** Facilitates saving current settings as a preset providing name and preset details.
8. **Preset Info:** Displays details of the currently loaded preset.
9. **Menu:**
    - **Resize:** Adjusts the GUI size (75%/100%/125%/150%/175%/200%), catering to different screen sizes and user preferences.
    - **Reset Parameters to Default:** Resets all plugin parameters to their default states.
    - Shows currently installed plug-in version.
10. **Bypass:** Allows to engage/disable bypass on the hardware unit.
11. **Iron Link:** Link between Output and Iron Pad in RED mode – for more information read chapter Iron Link.
12. **Input level numeric value:** This feature displays the current peak levels for both input channels numerically, providing a precise and immediate visual reference of the signal strength entering the ngTubeEQ.
13. **Input Meter:** The Input Meter visually represents the input levels for both hardware channels, utilizing an analog scale that ranges from 0dBu to 26dBu. This feature provides users with an intuitive and accurate way to monitor signal strength entering the ngTubeEQ, ensuring levels are kept within an optimal range for the best possible sound quality.
14. **Output level numeric value:** This feature displays the current peak levels for both output channels numerically, providing a precise and immediate visual reference of the signal strength leaving the ngTubeEQ.
15. **Output Meter:** The Output Meter visually represents the output levels for both hardware channels, utilizing an analog scale that ranges from 0dBu to 26dBu. This feature provides users with an intuitive and accurate way to monitor signal strength leaving the ngTubeEQ, ensuring levels are kept within an optimal range for the best possible sound quality.
16. **Info Box Context Menu:** The Info Box Context Menu in the ngTubeEQ plug-in enhances user interaction with the EQ's filters. This menu provides quick access to essential functionalities for fine-tuning the EQ bands, including:

- **For Passive Filters:** Users can disable or enable specific bands, offering control over which frequencies are affected during the mixing process. Additionally, this menu allows toggling between bell and shelf modes, giving users the flexibility to choose how broad or focused the EQ's impact is on the sound.
- **For HPF and LPF:** The menu extends the capability to enable or disable bands, ensuring precise control over the inclusion or exclusion of high-pass and low-pass filtering in the signal path. It also facilitates switching between 12dB/Octave and 18dB/Octave slopes, allowing users to select the steepness of the filter curve for gentle transitions or more pronounced cuts.

17. **Listen Mode –** enables listen mode for particular passive band – for more information, refer to Listen Mode – Band Focus Feature.
18. **Mute:** The Mute function in the ngTubeEQ plug-in allows users to enable or disable the mute feature for individual channels. This control provides a straightforward way to temporarily silence a channel without altering any of its settings, facilitating quick comparisons or isolations in the mix.
19. **Toggle Connection Button:** This button toggles the connection status ON/OFF. It functions only when a connection ID has been selected using the "Select Connection Button."
20. **The Select Connection Button** within the ngTubeEQ plug-in serves as a gateway to establishing and managing connections with devices that support the GCon protocol. This feature simplifies the process of identifying and selecting the hardware unit to be controlled, providing a user-friendly interface for seamless integration between the plug-in and physical devices.
    Upon Initiating Connection, It Visualizes the Connection State as Follows:
    - **USB:** This label signifies a connection established through USB, offering a direct link between the hardware unit and the workstation.
    - **ETH:** This label indicates an Ethernet connection, showcasing the ability to connect over a network for potentially more flexible setup options.
    - **Connection ID:** The unique identifier for the connected hardware unit is displayed, allowing for easy recognition and management of multiple devices. Accompanying this ID, the connection status is visually indicated to inform the user of the current state:
        1. **ON:** A solid white font denotes a successful connection, indicating that communication between the plug-in and the hardware unit is active.
        2. **OFF:** A solid gray font signifies that the connection is not established, alerting the user to a disconnect or other issue preventing communication.
        3. **Connecting:** A gray italic font is used to represent the process of establishing a connection. If this state persists for an extended period (more than 5 seconds) without successful connection, it suggests a potential issue requiring troubleshooting or support consultation.
21. **Copy:** Enables users to copy the current parameter state.
22. **Paste:** Enables users to paste the current parameter state, facilitating quick duplication of settings.
23. **Copy Left/Mid to Right/Side:** This feature enables quick duplication of settings from the left/mid channel to the right/side channel, simplifying the alignment of parameters between the two.
24. **Mode:** Sets units mode to be either DUAL, STEREO or Mid Side.
25. **Copy Right/Side to Left/Mid:** This feature enables quick duplication of settings from the right/side channel to the left/mid channel, simplifying the alignment of parameters between the two.
26. **Config Bank:** Selects between configuration banks, each containing three configurations. This feature supports automation for changing unit settings within a session or a song.

27. **Fast Preset Change (A/B/C):** Quickly toggles between configs A/B/C without affecting connection-related parameters like the Connection ID.

5.1.2. Stereo Plug-in - Stereo Mode

In Stereo mode, the Stereo plug-in shares the same controls as in Dual and MS modes. The key difference is that Stereo mode consolidates the interface to display only one channel. This visible channel functions as the master, automatically synchronizing both hardware channels to the same settings.

5.1.3. Mono Plug-in

Mono plugins offer the flexibility to connect and control each channel of the ngTubeEQ independently, making them ideal for processing separate mono sources, such as a kick drum and snare. This capability allows for comprehensive control over the analog circuit, including the ability to switch between internal presets (A/B/C), tailored for individual channel enhancements.

The layout of the mono plugin closely mirrors that of the hardware, maintaining the intuitive interface and design of the 2-channel stereo plugin version. However, there's a notable difference: the unit mode buttons (DUAL / STEREO / MS) are absent in this configuration. This is because, in mono plugin mode, the ngTubeEQ automatically operates in DUAL unlinked mode, optimizing it for independent channel processing.

Key Features of True Dual-Mono Operation with the Mono Plugin:

- **IRON Mode Flexibility:** Each channel's IRON mode setting can be adjusted independently, providing tailored harmonic texture and saturation for each mono source.
- **Selective A/B/C Preset Control:** To switch between the A/B/C presets from the hardware's front panel, you must hold the touch encoder specific to the channel you wish to adjust. This feature ensures precise control over the sound shaping and character of each channel, reflecting the nuanced differences between mono sources.

This design philosophy emphasizes the ngTubeEQ's versatility and adaptability, allowing audio engineers to achieve detailed and characterful processing on individual mono tracks, leveraging the analog warmth and digital precision that the ngTubeEQ is known for.

5.1.4. Dual/MS Mode – Automation When Parameter Link Is Enabled

It's important to understand that when using the PARAMETER LINK function to synchronize channels, automating just one channel is sufficient, as the linked channel will mirror the adjustments automatically. Should both channels be automated simultaneously, each will attempt to update the other, inevitably causing unpredictable and undesired outcomes. This feature is designed to streamline workflow and ensure cohesive sound processing across channels, but it requires careful management of automation to avoid conflicts.

6. Other Functions

In addition to its core features, ngTubeEQ includes several other functions that enhance its versatility and user experience. These functions, while not as prominently featured as the main controls, play a crucial role in the unit's overall functionality and ease of use. Understanding these additional features will enable users to fully exploit the capabilities of the ngTubeEQ, optimizing their workflow and achieving the best possible sound quality.

6.1. Operation modes:

ngTubeEQ can operate in following modes:

- Standalone – without any digital connection to a workstation.
- Stereo Plug-in – one plug-in manages both channels.
- Mon Plug-in – Two plug-ins can independently connect to each channel.

There are some slight differences in those tree modes when it comes to some global unit's functions:

	Bypass	**A/B/C buttons on front panel**	**IRON mode in Mid-Side**	**Available Modes**
Standalone	Bypass available for each channel, can be linked via "Parameter link" button.	Changing A/B/C preset will always update parameters on both channels	IRON mode is permanently linked for both channels– it is not possible to engage iron mode for only one channel.	Dual mono, Stereo, Mid-Side
Stereo plug-in	Bypass is permanently linked – One bypass for whole unit will affect both channels.	Changing A/B/C preset will always update parameters on both channels.	IRON mode is permanently linked for both channels– it is not possible to engage iron mode for only one channel.	Dual mono, Stereo, Mid-Side
Mono plug-in	Bypass available for each channel.	A/B/C LED is disabled upon connection to a plugin, presets can be changed: • From a plug-in level, • Holding touch sensitive encoder activates A/B/C LED for particular channel, which can be changed by pressing corresponding preset button.	N/A -Connection to mono plugin permanently sets dual mono mode.	Dual mono

6.2. Internal Memory Management

The ngTubeEQ is designed with robust internal memory management to ensure users can store and recall their preferred settings efficiently, catering to various operational scenarios and user needs.

Sources of Parameter Persistency:

- A/B/C Presets: Directly stored in the ngTubeEQ's internal memory, these presets offer quick access to three distinct settings configurations, readily available even after a power cycle.
- 100 Internal Presets: Beyond the fast-access presets, the unit houses 100 internal presets, navigable via the unit's menu for a wide range of storage options.
- Unlimited DAW Plugin Presets: Users can save an unlimited number of presets within the DAW plugin, providing vast flexibility for project-specific settings.

6.2.1. Fast Presets A/B/C

Fast presets are designed for quick retrieval, serving as three memory banks for easy comparison of the unit's settings. These presets are synchronized with the connected plugin, ensuring consistency across hardware and software environments.

6.2.2. Internal Presets

For scenarios where plugin use is impractical or impossible, the ngTubeEQ offers 100 memory slots for user-defined presets, which load into the currently active Fast Preset (A, B, or C).

Navigating and Managing Internal Presets:

- **Accessing Preset Menu:** Press and hold the PARAMETER LINK (MENU) button for 2 seconds to enter the PRESET MENU. Use the bypass buttons to navigate through presets 1 to 100.
- **Navigating Presets:** Use the left bypass button to move to the previous preset and the right bypass to advance.
- **Loading Presets:** Press button A (LOAD) to load the selected preset into the active Fast Preset slot.
- **Exiting Menu:** Press button B (QUIT) or the PARAMETER LINK (MENU) button to exit the preset menu.
- **Saving Presets:** Select the desired preset number and press button C (SAVE) to store the current settings of both channels under that preset number.

This internal memory management system enhances the ngTubeEQ's versatility, providing users with multiple layers of preset storage options, from immediate access to detailed preset navigation and management, all aimed at optimizing the mixing and mastering process.

7. Abbreviations and terms

GCon is a high-speed communication protocol developed to enable complete management and recall of analog devices. It's important to note that GCon is solely focused on device control and management; it does not facilitate the transfer of audio signals. This protocol is instrumental in bridging the gap between analog warmth and digital convenience, allowing users to enjoy the best of both worlds without compromising on sound quality or control flexibility.

NG500 represents the next generation in the 500 series format, offering advancements in technology and integration capabilities for audio processing hardware. This evolution maintains compatibility with existing standards while introducing improvements in power, connectivity, and digital control.

The NG500 connector is a specialized extension of the standard 500 series connector, incorporating additional pins to support enhanced features. These include digital control signals facilitated by the GCon protocol, power management improvements, and potentially other functionalities that exceed the capabilities of the traditional 500 series format. This connector ensures that NG500 series modules can leverage advanced digital control and management while maintaining the character and quality of analog audio processing.

8. Warranty

WesAudio is committed to delivering products of the highest quality, designed for durable and reliable performance over many years, assuming proper care, usage, transport, and storage. Our products come with a two-year warranty covering defects in parts and workmanship from the original date of purchase. This warranty is extendable to any future owner within the warranty period, ensuring continued protection.

Warranty Coverage:

- The warranty is valid for two years from the date of the original purchase.
- It is transferable to any subsequent owner within this period.

Exclusions:

- The warranty does not cover normal wear and tear.
- It excludes damages due to misuse, negligence by the customer, accidental impacts, unauthorized modifications or repairs, cosmetic issues, and damages from shipping.

Warranty Service:

- Should a product exhibit defect in parts or workmanship during the warranty period, WesAudio will, at its discretion, repair or replace the defective components at no charge, assuming the customer provides valid proof of purchase.
- The product must retain its original factory serial number to be eligible.
- Customers are responsible for shipping costs to WesAudio for warranty service. WesAudio will cover the return ground shipping costs.

This comprehensive warranty underscores our dedication to quality and customer satisfaction, ensuring your WesAudio products perform flawlessly for years to come.

9. History

Editor	Version	Date	Description
Michal Weglicki	**V1**	**25.04.2024**	**Document created.**