



QUANTEC YARDSTICK 249x Series

Operations Guide Rev. 4.2

pp. 225 to 226 are dedicated to all those fellow-humans
who insist on ***not*** reading operations guides.

Revision history

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We will prosecute anyone attempting to cheat us out of decades of hard work and we will assert our right to compensation.

CE Conformity

The equipment described within this document conforms to applicable EC directives 73/23/EWG (Low Voltage Directive), amended by 93/68/EWG, and 89/336/EWG (EMC Directives – Electromagnetic Compatibility), amended by 91/263/EWG, 92/31/EWG and 93/68/EWG.

The standards applied here are for Low Voltage directive **EN60065:1993** (4.94 – formerly VDE0860) – "**Safety requirements for mains operated electronic and related apparatus for household and similar general use**", and for EMC directive **prEN55103-1:1995** (Emission) and **prEN55103-2:1995** (Immunity) – "**Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use.**"

The equipment satisfies **all** of the operating environments of classes **E1** to **E5** described in EN55103:

- E1 **Residential (including both of the classes rural residential and urban residential as described in IEC 1000-2-5)**
- E2 **Commercial and light industrial (including theaters)**
- E3 **Urban outdoors**
- E4 **Controlled EMC environment (for example TV studios) and rural outdoors environment (far away from railways, transmitters, overhead power lines, etc.)**
- E5 **Heavy industrial (see EN 50081-2) and environments close to broadcast transmitters**

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Other sources of information

- See our regularly updated collection of FAQs (*»Frequently Asked Questions«*) at www.quantec.com?faq
- Individual FAQs (e. g. references mentioned within this operations guide):
 - www.quantec.com?faq001
 - www.quantec.com?faq002
 - ...
- Compare all QUANTEC DSP products (incl. 249x) at www.quantec.com?prod_comp

Advice for printing

The layout of this operations guide allows both to be printed in single or dual-sided A4 (~Letter) format, or as an A5 (~Invoice) booklet (4 pages per sheet). In both cases there is enough space for a spiral binding.

Room Simulation – reverb with a substantial distinction

Unlike a reverberator with its **ray-tracing** perspective (*»reflections«*),
a QUANTEC room simulator
approaches room acoustics
from the **air** as a **carrier medium** (*»resonances«*).

Translating "*room*" to a wind instrument,
the competition would concentrate
on the *solid interior boundaries*
of the wooden or brass instrument body.

QUANTEC, in contrast,
concentrates its simulation resources
on the *elastic, vibrating air column* within the instrument.

QUANTEC – the favorite reverb of any reverb naysayer

The YARDSTICK 249x series of room simulators are high-quality, digital sound processing devices based on the original 1982 QRS Room Simulation algorithm. Due to its unobtrusive, natural character, and its superb room simulation, the original QRS has become a lot more than just a well-know production tool for pop music.

In all fields of classical music production, as well as in movie post-production, the QRS is considered to be the yardstick for all competing products.

In other words, whenever an unobtrusive, natural sounding ambience is desired, and any kind of artificial reverberation is not, the QRS algorithm has been repeatedly praised by countless renowned sound professionals.

Due to the sophisticated characteristics of the QRS algorithm, any QUANTEC Room Simulator stands out favorably among the competition. But there are quite a few situations where its sonic qualities really shine:

- In the final mix, where it is unobtrusively transparent with virtually no tendency to blur – even with a full dose over the entire set of tracks.
- In a multitude of productions in classical music, where any reverberation with an artificial smack is undesirable – for stylistic reasons alone.
- In the production of movies and radio dramas, where its virtually tangible room illusions simulate real rooms, which – in cramped environments – may actually create a physically unpleasant feeling of pressure.
- In movie productions, using its outstanding ambience in spacious effects.
- In sound reinforcement and P.A., where those pronounced resonance lines and gaps in the acoustic spectrum of a hall not suited for musical performances can be averaged and smoothed out. As a result, the sound of a general-purpose municipal hall becomes more suitable for music, and the risk of feedback is reduced.
- During the musical-improvisatory *play with the reverberation onset* – or the *effervescence of the room*.

Since the sound characteristic of the QRS algorithm – and thus that of a YARDSTICK as well – is quite a bit different when compared to the competition, it inevitably will have a significant influence on the number and types of the parameters available.

What makes QUANTEC Room Simulation second-to-none?

Like any real room, QUANTEC extracts *all* room-acoustic phenomena from a *single* room model structure; and not from *segregated* partial algorithm sections like our competitors do. With QUANTEC, the entire bunch of room effects is always in sync; as any inconsistent settings, which would conflict with a real room, would conflict with our room model, too. For example, both *attack* (»initial reflections«) and *decay* (»reverb tail«) slope lines are linked with sort of an *imaginary hinge-joint* (see Fig. 1), which in turn depends mainly on room size and RT60.

Our room model is an *all-in-one* solution for *concurrently* emulating a multitude of real-room acoustic and psycho-acoustic phenomena:

- initial reflections
(see [FAQ 024](#))
- gradual build-up
(see [FAQ 023](#) and [FAQ 059](#))
- reverb tail - dense, but with absolutely no discoloration anyway
(see [FAQ 028](#), [FAQ 036](#), [FAQ 066](#) and [FAQ 069](#))
- physical *feeling of pressure* with extremely small rooms
(see www.quantec.com?small_rooms)
- the inherent *subsonic tremble* of huge rooms *)
(see [FAQ 035](#))
- *history-based* random interferences - no random *generators* *)
(see [FAQ 028](#))
- capturing of *acoustic sequences* (e.g. trills) along extended propagation paths *)
(see [FAQ 059](#))
- hundreds of *positional* room mode spectra (»IRs«) across the sound-field *)
(see [FAQ 013](#), [FAQ 041](#) and www.quantec.com?about_irs)
- cocktail party effect *)
(see [FAQ 039](#))
- Hallelujah effect *)
(see [FAQ 023](#) and www.quantec.com?room_simulation)

Our room simulation algorithm *is strictly in its natural state*; in particular with *no Leslie added* (*aka.* »modulation« – see [FAQ 028](#)). So it can be used without restrictions, even for classical piano music.

*) = unique to Quantec; initially released on the current 249x series, or largely improved, compared to our previous devices.

The Hallelujah effect

The Hallelujah effect is an absolute USP for QUANTEC. For the first time published as a commented chart in Jan 2010 on our website (and in part in our operations guides Feb 2010), our discovery is still so new, that there are no scientific records obtainable (as of Feb 2014). Information on the Hallelujah effect is currently available only here and on our website: www.quantec.com?room_simulation

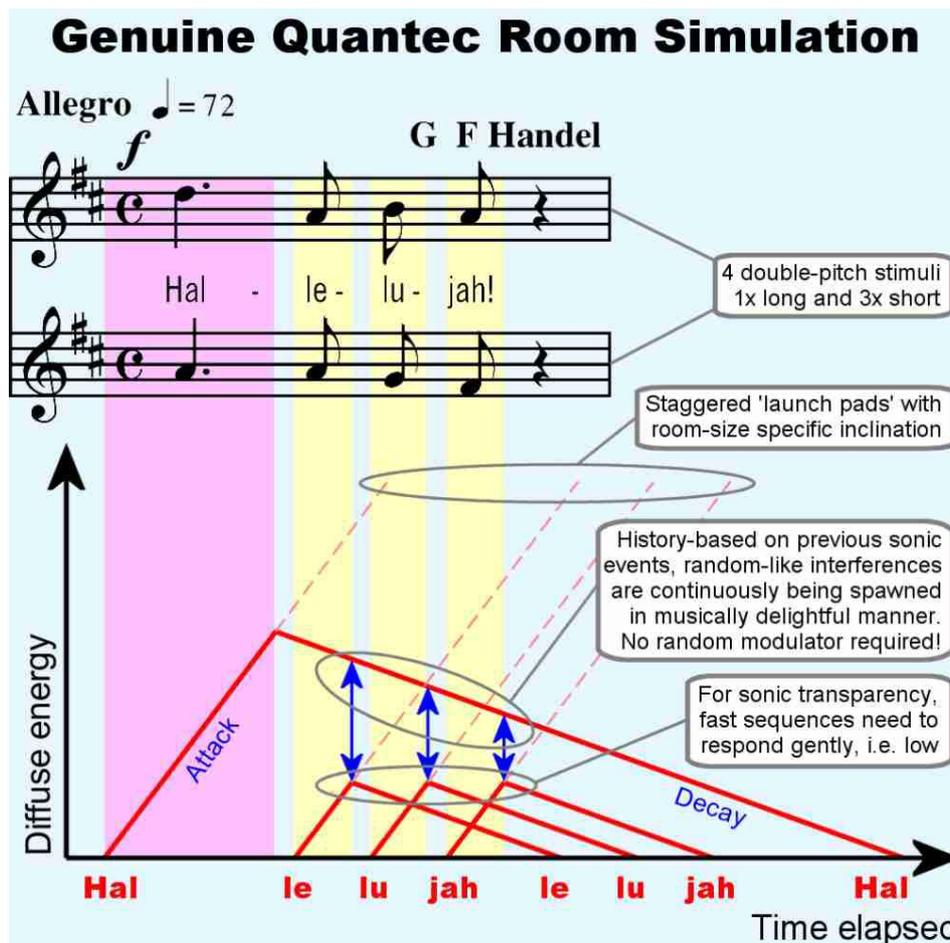


Fig. 1: Hallelujah diagram for Room Simulation

The most striking feature of the Hallelujah effect is its ability to massively intervene in the *chronological order* of a musical sequence. Along with various other acoustic phenomena, the diagram (Fig. 1) visualizes in red how Room Simulation, analogous to a real room, may rearrange the syllables (and hence also the notes) here. Based on the original »Hal-le-lu-jah«, the room responds with »le-lu-jah-Hal« in our example. **Such a permutation within musical phrases, far too complex for human hearing, is one more reason why true room simulation sounds so stunningly alive.**

As seen in the diagram (Fig. 2), there is no indication of a Hallelujah effect when examining reverberators from the competition. Apart from a slight compression in its timing, the basic »Hal-le-lu-jah« sequence is being transferred unaltered. Moreover, Fig. 2 visualizes several undesirable side effects, that inevitably occur in the concepts of our competitors.

What about those problems lurking behind competitors' units?

There are quite a few *"less than perfect solutions"* in their concepts. A **simple roping up of independent partial algorithm components** means that, under certain constraints, ugly side-effects may show up without warning.

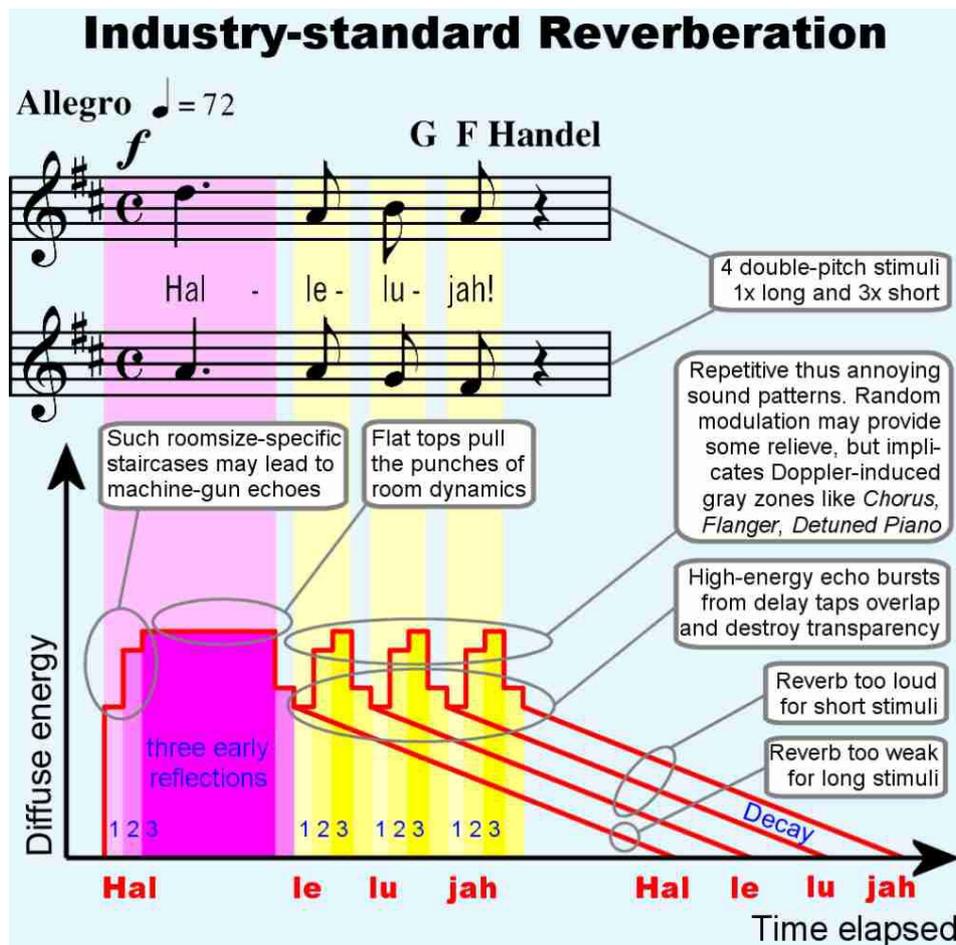


Fig. 2: Hallelujah diagram for a reverberator

To minimize such risks, an experienced mix-down engineer is trained to follow that maybe wrong-headed strategy of *"one reverb for drums"*, *"one reverb for voice"*, and *"one reverb for piano"*.

To ultimately put all those *contradictory reverb situations* back into *one* room, our deplorable sound engineer needs to work his fingers to the bone while fine-tuning for quite some time. We're talking about hours, over and over again, not just minutes; while an impatient producer is peeking over his shoulder.

Regardless of **instruments**, regardless of **settings**:
QUANTEC rooms always sound real.

How many initial reflections?

People always ask us why the QRS algorithm comes with only a single, meager »*first reflection*« – after all, our competitors offer thirty or more early reflections, all of which can be defined individually in position and level.

To this we must go back a little further. Traditional reverberation algorithms separate their reverberation output, really the *room pulse response*, into two successive phases each produced by an algorithm, or even a signal processor, of its own:

- the *attack* with its discrete initial reflections based on a multi-tap delay line
- the *reverberation tail* with a reflection density as large as possible (read *infinite*); this reverberation is produced by cascaded all-pass networks, cross-coupled delay lines, or other sophisticated structures

This is different from what happens in the real world, where both phases of the room response are produced *by one and the same signal processor*. A *natural signal processor* – in other words, the elementary structure of a room with its usual six boundaries, as well as the objects (diffusers) in it – creates *both* the first reflections *and* the continuous spectra. Thus, for a natural-sounding room, the two phases of the room response should never be separated from each other. For this reason, the initial reflections cannot just be fished out from the total room, and naively be committed to the sound engineer.

In this context, we were told of a singer who once put this phenomenon into words. "*With this device, I had the impression for the first time that there was no more annoyances between my voice and the room*". No wonder, as the annoying discontinuity between the attack and decay responses has now vanished.

Thus the first reflection of the QRS algorithm is nothing more than an *additional effect* with which to simulate slap echoes, such as those of a brass section, a backyard, or even mountain ranges.

On the frequency-dependent RT60 response of reverb

Further features are the frequency-dependent resonators within the QRS algorithm. In stark contrast to some products from the competition, the input signal is *not* handed over to a number of band-pass separated reverberation generators – or *rooms* – via a multi-output crossover network. Some competitive units use a crossover network from which *one* room with, say, 500 Hz bandwidth is optimized for the low-end reverberation, *a second* room between 500 Hz and 5 kHz for the mid-range, and *a third* room for the high-end reverberation above 5 kHz.

Again, just as was mentioned for the first reflections: a *natural signal processor* does all this *at the same time*. That's why using a crossover network over several reverberation generators is a design mistake right from the beginning.

Equivalent to a natural room, the QRS algorithm treats the boundaries of a room, and also the boundaries of the diffusers inside the room, as resonators (*low frequencies*), or as absorptive surfaces (*high frequencies*). This furnishing either absorbs or reflects the arriving broadband sound spectrum according to its frequency components. This is done gradually: the lower the frequency, the less absorption, and thus the more pronounced room resonance at that frequency.

Stereo and 3D Compatibility

The idea is that *a real stereo signal*, and not some sort of *sum of both channels*, is fed into the simulated room. This is vital. With simple time-difference stereo, any kind of mixing prior to the reverb input will result in annoying comb filter effects, which will then be superimposed on the simulated room. Since listeners orient themselves mostly by the early diffuse component for their spatial impression, the inherent spatial depth of e.g. a 3D or dummy-head recording would compete and lose against that time-distorted *diffuse mush energy*. The *spatial impression* captured by a dummy-head recording would get lost in an overall impression of a *comb-filtered room*.

As an important prerequisite for the superior spatial transparency of the QRS algorithm, both stereo channels are mixed not before the complex phase and frequency behavior of the simulated room. This is the only way to transpose the input signal's spatial transparency into the simulated room. Such an approach even preserves the *vertical components* of real 3D signals. We challenge you to feed a most finely-structured signal both into the QRS algorithm and a competing product, and not marvel at the QUANTEC unit's ability to handle such a touchy input signal.

On the output side, a similar situation exists. It's not enough for the outputs to be *arbitrarily* related to each other. Let's consider the limit values. A *100 % correlation* would yield mono and ruin the spaciousness completely.

At the other extrema, a *0 % correlation* between the outputs would correspond to a listener standing right in the door between two similar concert halls. Both concert halls would be fed with the same music from a loudspeaker within each room. As a result, the *left ear* would receive the *left* concert hall response, and the *right ear* the *right* one. If it wasn't for the inevitable crosstalk from the left concert hall into the right ear, and vice versa, the spatial clues would have been completely destroyed, again.

This picture all-too-true illustrates the trick of maximizing the spatial effect of a simulated room: set correct *crosstalk* between the various outputs. This corresponds to correctly placing the "*virtual microphones*" that capture the pulse response, before finally carry-out the sound back into the real world.

Further information can be found in the description of the block-diagram room microphones on p. 14, and the description of the **Discorrelator Pattern** menu item on p. 117.

Reverberation chamber and virtual transducers

As seen in the block diagrams (pp. 15), the main signal processing is done in the reverberation chamber, having as elements virtual loudspeakers and microphones.

The following assumptions were applied to the microphones in the reverberation chamber:

- the distance between any two microphones should be as large as possible
- the correlation between any two microphones should be 50 %

Background information – what is a reverberation chamber?

At arbitrary locations within a reverberant chamber, an audio signal's content and energy are *statistically identical* – although scrambled and jagged in very complex patterns.

In the far field – and thus at the *reverberation chamber microphones* – a point source is spread such as to eventually lose its spatial location completely. Integrated over time, all microphones receive an identical audio information, and are thus generally equivalent and interchangeable.

Other than the left/right stage, front/back information doesn't rely on correlation. The initially equivalent virtual room microphones constitute their front and back illusion merely through user-defined staggered postdelay. This is the role of the *2nd Delay* parameter discussed on p. 29. To preserve the horizontal (left/right) image when virtually *stepping towards the back* of the room, postdelay is locked in channel pairs.

However, for the discrimination of left/right signal, no extra processing is necessary. The ear uses the information of the first wave front as explained by the *Haas effect*. This first wave emanating from the front has all the required information, and no additional intervention is necessary.

A correlation of 50 % guarantees that all microphones are located in the same room. *No correlation* would correspond to having the reverberation microphones distributed into independent rooms, but receiving the same source signal. As an acoustic design element, such an uncorrelated (0 % correlation) reverb might occasionally be a desired effect. But in a real room, there is always a certain amount of »*statistic crosstalk*«. As a result, a correlation setting of 50 % (»*QUANTEC in-house standard*«) is the nominal value used by the QRS algorithm since its infancy.

Implementation of the QRS algorithm

The QRS algorithm is available in various quality levels: **SIMPLE**, **MEDIUM**, and **COMPLX**. Depending on the number of inputs and outputs, the quality level restricts the desired sample rate – or vice versa. More information on the levels of quality can be found in [FAQ 012](#).

- 2492** 2 digital AES3 inputs, 2 digital AES3 outputs, sample rates up to 216 kHz (incl. varispeed)
- COMPLX** sample rate 44,1/48 kHz ± 12,5 % varispeed
- MEDIUM** sample rate 88,2/96 kHz ± 12,5 % varispeed
- SIMPLE** sample rate 176,4/192 kHz ± 12,5 % varispeed

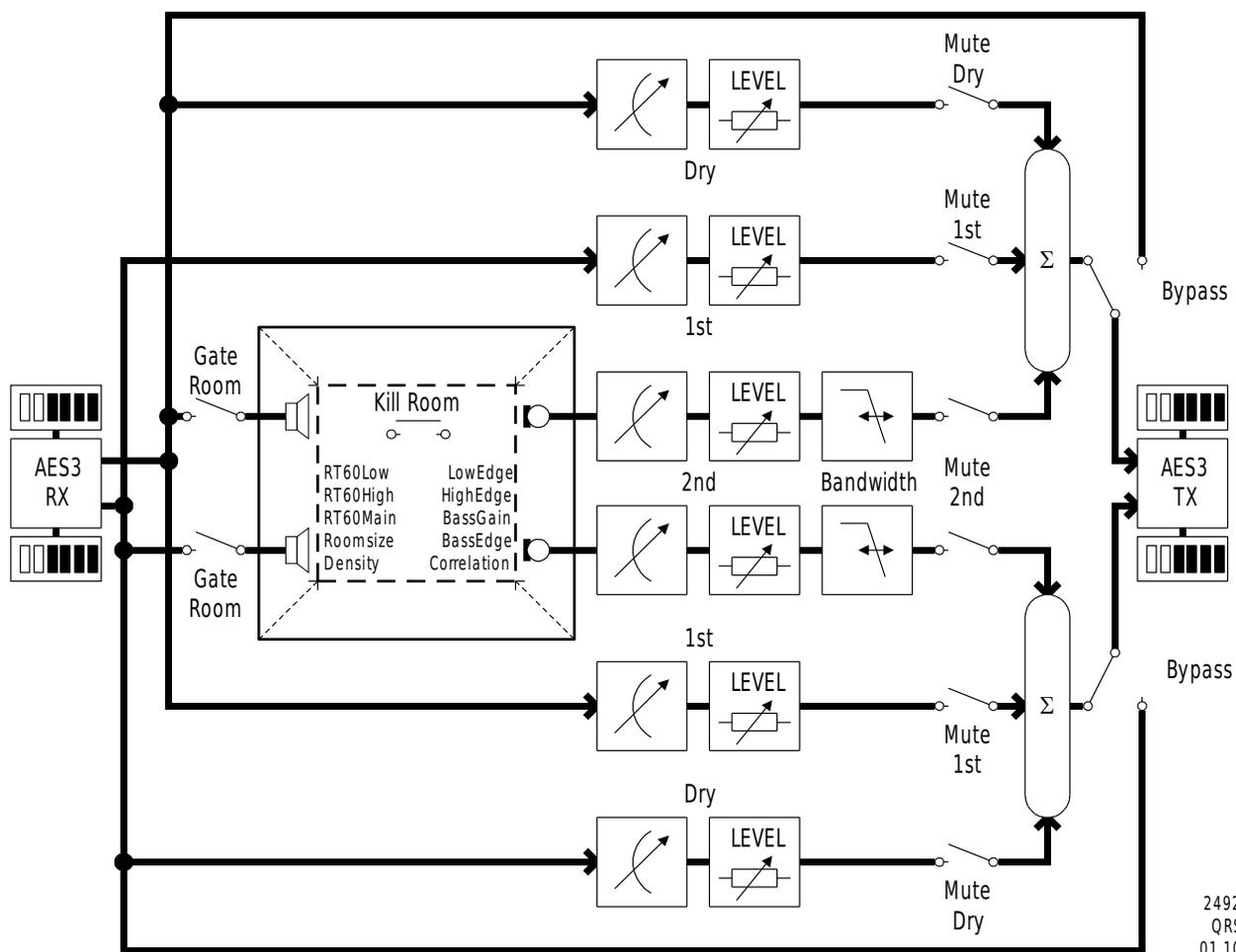


Fig. 3: 2492 block diagram – QRS plug-in



- 2493** 2 analog inputs, 2 analog outputs,
sample rate up to 192 kHz
- COMPLX** sample rate 48 kHz (fixed crystal clock)
- MEDIUM** sample rate 96 kHz (fixed crystal clock)
- SIMPLE** sample rate 192 kHz (fixed crystal clock)

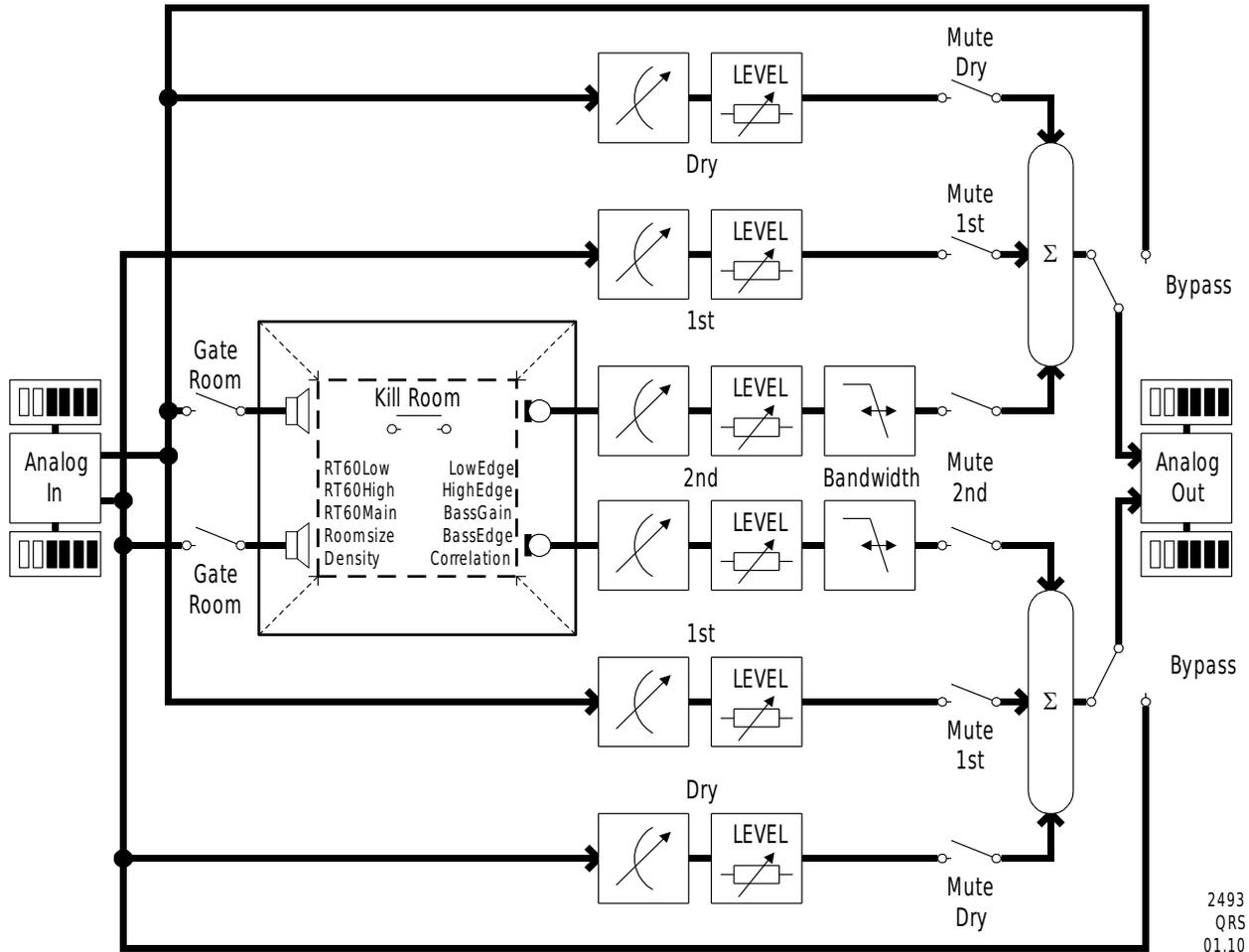


Fig. 4: 2493 block diagram – QRS plug-in

- 2496** 2 digital AES3 inputs, 6 digital AES3 outputs,
plug-in sample rates up to 216 kHz (incl. varispeed)

- COMPLX** sample rate 44,1/48 kHz ± 12,5 % varispeed

- MEDIUM** sample rate 88,2/96 kHz ± 12,5 % varispeed

- SIMPLE** sample rate 176,4/192 kHz ± 12,5 % varispeed,
restricted to 2 outputs

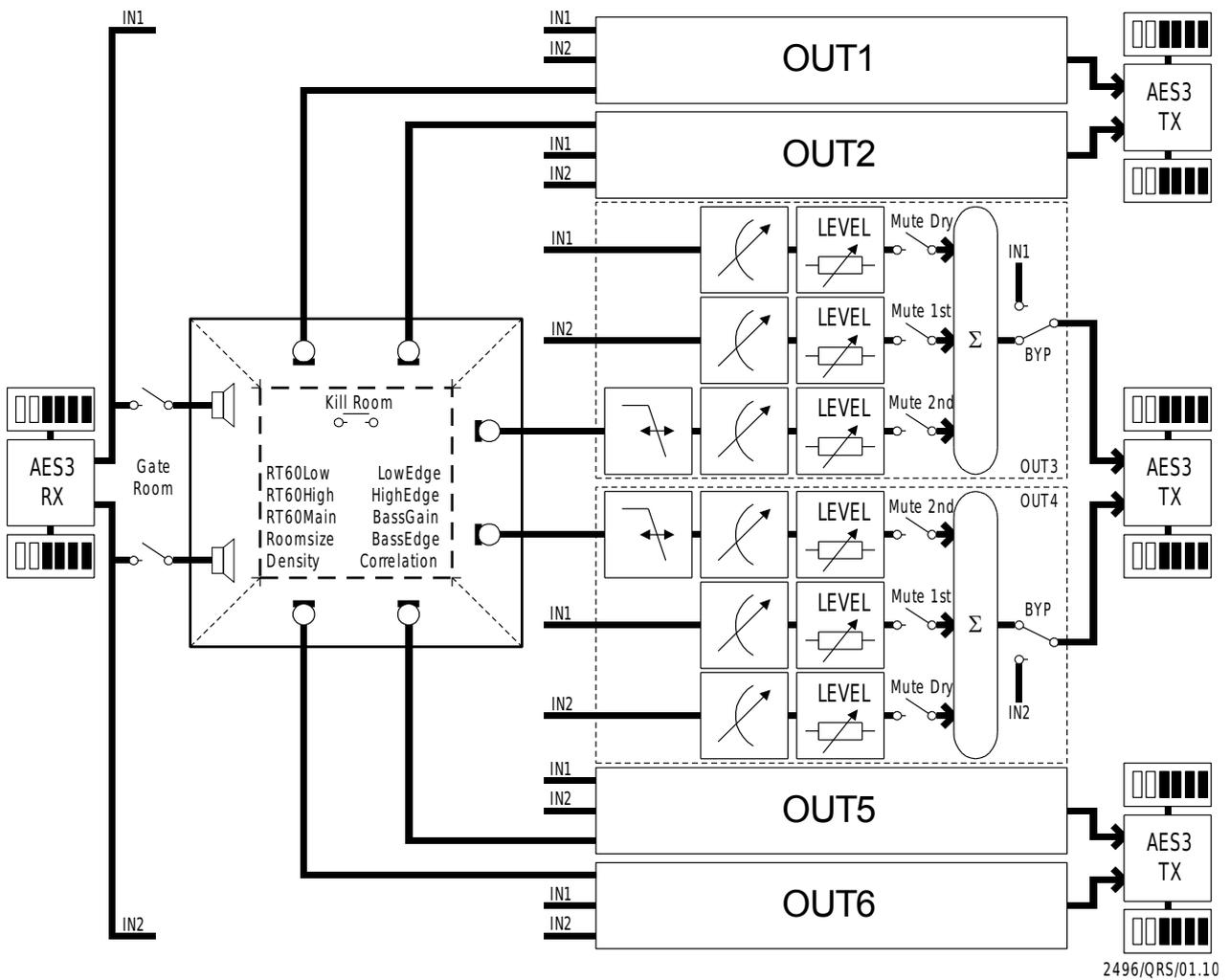


Fig. 5: 2496 block diagram – QRS plug-in

2498	8+2 digital AES3 inputs, 8 digital AES3 outputs, plug-in sample rates up to 108 kHz (incl. varispeed)
COMPLX	sample rate 44,1/48 kHz \pm 12,5 % varispeed, modes 2→8 and 8→8
MEDIUM	sample rate 88,2/96 kHz \pm 12,5 % varispeed, restricted to mode 2→8
SIMPLE	not available

Operating modes of QRS type plug-ins on 2498

Mode 2→8 If the SYNC XLR input is locked exclusively, the unit falls back to 2→8 mode. In this mode, the signal from the SYNC input will be distributed evenly among the entire set of room speakers. All pre-room level settings, delay lines, and filters will be disabled.

Mode 8→8 If at least one of the DSUB inputs is locked, the unit fully activates 8→8 mode. In this mode, all DSUB inputs will be forwarded one-by-one to the eight room speakers. All eight input signals' levels, delays, and bandwidths may be individually adjusted.

Each input signal pair contributes a quarter of the total echo and resonance density. For critical signals, an intentional parallel operation of multiple pairs may be advantageous.

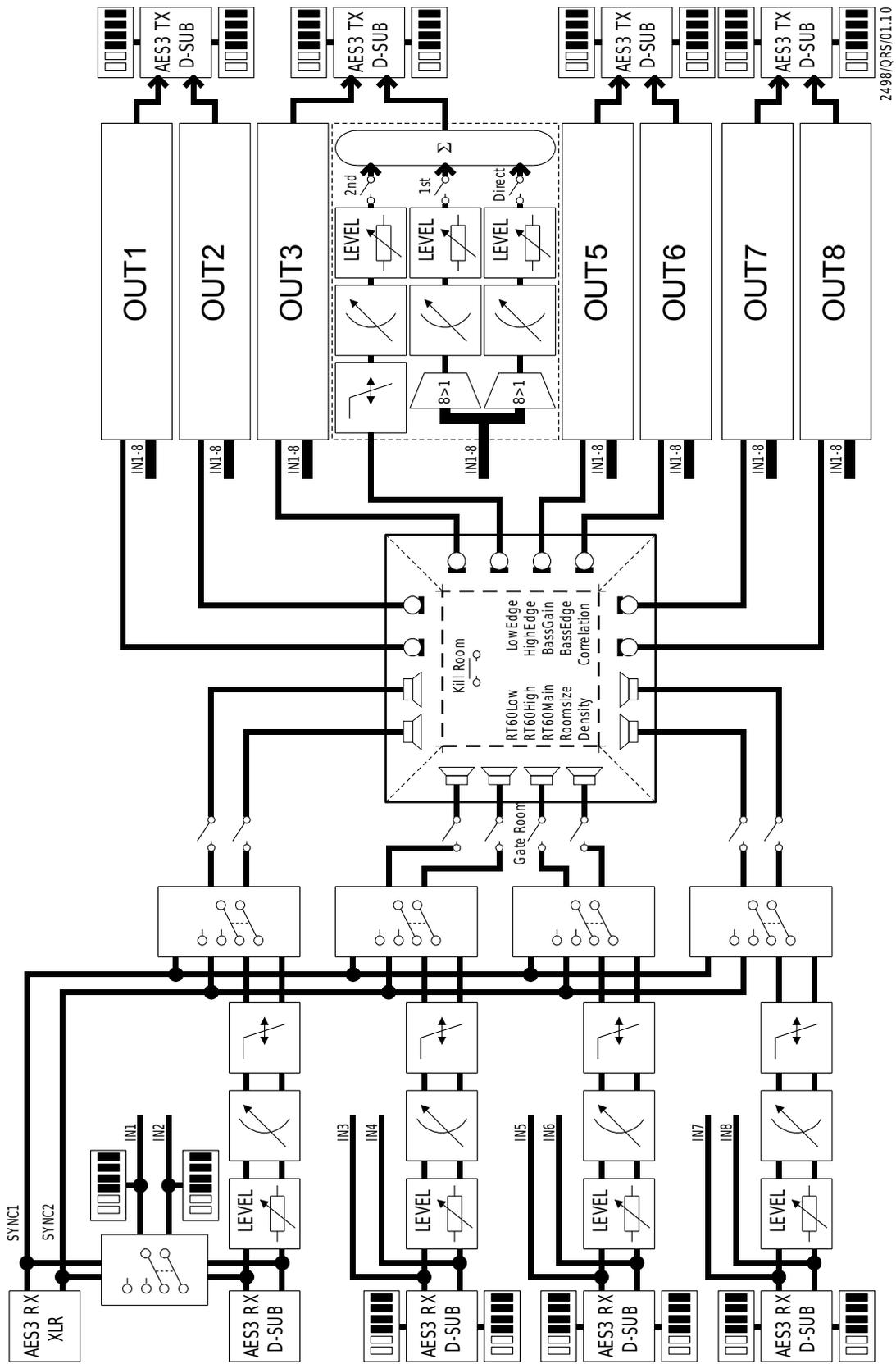
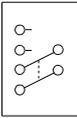


Fig. 6: 2498 block diagram – QRS plug-in

Caption for the block diagrams

	level setting
	adjustable delay line
	tunable low pass filter
	bargraph
	stereo selector
	switch (SPST)
	virtual loudspeaker
	virtual microphone
	pushbutton
	sum/adder
	8-in selector
	2-in selector
	AES3 (=AES/EBU) receiver
	AES3 (=AES/EBU) transmitter
Dry	direct path (dry)
1st	initial reflection
2nd	reverberation path (wet)

The Basics

Device specifications

The following QUANTEC YARDSTICK 249x series devices are currently available:

2492	2 digital AES3 inputs, 2 digital AES3 outputs, plug-in sample rate up to 216 kHz (incl. varispeed)
2493	2 analog inputs, 2 analog outputs, sample rates of 48 kHz, 96 kHz, and 192 kHz
2496	2 digital AES3 inputs, 6 digital AES3 outputs, plug-in sample rate up to 216 kHz (incl. varispeed)
2498	8+2 digital AES3 inputs, 8 digital AES3 outputs, plug-in sample rate up to 108 kHz (incl. varispeed)

Note: A comparison table with all QUANTEC units can be found on www.quantec.com/prod_comp.

Basic functionality

All units of the YARDSTICK 249x series provide an "official" implementation of the QRS algorithm. QRS stands for "QUANTEC Room Simulation". The algorithm can be controlled by various parameters. The parameters are explained in detail starting on p. 23. All Parameters of the algorithm are summarized to a *Preset*. Each Preset generally represents a room situation, and can be provided with name and timestamp for archiving.

The YARDSTICK 249x series devices have 2 **working presets**: *Scratch A (read/write)* and *Scratch B (read-only)*. Both can be loaded with data from various archived Presets. Scratch A is editable; it's targeted for intentional modifications. Scratch B is locked against changes; it serves as a reference when comparing two Presets.

Control and archiving concepts

The following options are available for **controlling** the 249x YARDSTICK series:

	2492	2493	2496	2498
Device front panel – operation mode 1: menu navigation with wheel and ENTER/EXIT keys	✓	✓	✓	✓
Device front panel – operation mode 2: direct access through toggle keys and pushbuttons	-	-	✓	✓
Handheld remote control units: various 241x devices over Ethernet/PoE	TBA			
PC/Mac from web browser remote control over Ethernet	✓	✓	✓	✓
PC/Mac from HW plug-in (e.g. VST, AU, RTAS, ...) remote control over Ethernet or USB	TBA			
MIDI via DIN	✓	✓	✓	✓
MIDI via Ethernet	TBA			

Fig. 7: Operating concepts

For **archiving** of Presets, the following options are available:

	2492	2493	2496	2498
Saving to / loading from PC using RS-232	✓	✓	✓	✓
Saving to / loading from PC/Mac using USB	TBA			
PC/Mac from web browser Preset management via Ethernet	✓	✓	✓	✓
PC/Mac from HW plug-in (e.g. VST, AU, RTAS, ...) Preset management via Ethernet	TBA			
MIDI on a MIDI track of your editor via DIN	✓	✓	✓	✓
MIDI as file on your PC/Mac via DIN	✓	✓	✓	✓
MIDI on a MIDI track of your editor via Ethernet/USB	TBA			
MIDI as file on your PC/Mac via Ethernet/USB	TBA			

Fig. 8: Archiving concepts

Effect Parameters

Effect parameters are divided into **4 groups**.

The **1st group** controls the reverberation chamber: *Room Size*, *Density*, *RT60 Main*, *RT60 Low*, *RT60 High*, *Low Edge*, *High Edge*, *Bass Gain*, and *Bass Edge*.

The **2nd group** controls the auxiliary paths *Dry* and *Ist*. Similar to a bypass, these are dual auxiliary chains for relaying *one* (2492, 2493, 2496) or *four* (2498) stereo input pair(s) to any output pair. This group consists of the following parameters: *Dry Level*, *Ist Level*, *Dry Delay*, *Ist Delay*, *Ist Delay±*, *Dry Source*, and *Ist Source*.

The **3rd group** controls postprocessing of the reverberation chamber's outputs. This group consists of the following parameters: *2nd Level*, *2nd Delay*, *2nd Cut*, and *2nd Correlation*.

The **4th group** is available for devices with multiple input pairs only. The reverberation chamber can be fed with up to *eight phase-insensitive* surround inputs (up to 7.1 or 8.0), or up to *four* stereo input pairs with depth staggering. Before fed into the reverberation chamber, these inputs can be controlled by the preprocessing parameters as joint L/R pairs. These are: *Pre Level*, *Pre Delay*, and *Pre Cut*.

Room Size

The *Room Size* of the simulated reverberation chamber takes on values of **1E0 m3**, **1E1 m3**, **1E2 m3**, **1E3 m3**, **1E4 m3**, **1E5 m3**, and **1E6 m3**.

It's a very complex parameter, influencing (but not limited to)

- minimum and maximum RT60
- temporal positioning and distribution of initial reflections
- gradual build-up of sound-field
- folding angles of *Hallelujah effect* hinges
- density and distribution of room modes (*»room resonances«*)
- physical feeling of pressure with extremely small rooms
- characterization of the inherent subsonic tremble of huge rooms
- capturing of acoustic sequences (e.g. trills) along extended propagation paths
- number and distribution of positional room mode spectra (*»IRs«*) across the sound-field

For software versions 1.x, the *Room Size* parameter has been available on the 2496 and 2498 only. For both the vintage 2402 YARDSTICK and early 2492 software versions (1.x), *Room Size* has been fixed to 10⁵ m³. For 2.0 and above, the *Room Size* parameter has been made available on all 249x devices. More on this in [FAQ 008](#) and [FAQ 069](#).

Density

Density of the reverberant sound-field takes on values of **0%**, **10%**, **16%**, **25%**, **40%**, **63%**, **100%**, **125%**, **160%** and **200%**. **0%** (previously called **CONSTANT**) results in a *constant* reflection density. *Non-zero* values simulate reflected energy within real chambers, which cumulates proportionally with the *square of the elapsed time*. The **100%** setting tries to replicate the former **BUILD UP**. Due to the 249x series' enormously increased echo density, this is only a rough approximation.

High Density values greatly lengthen, or even psycho-acoustically "*lift up*" the ends of the reverb tails, and so typically render an RT60 definition useless. Exactly that *apparently* non-linear behavior has been a unique highlight of early QRS algorithms; prized in the industry since 1982.

Note: Density values above **100%** are a compromise between a desired initial high reflection density, and a slight tendency towards a metallic-sounding reverberation tail.

Note: The Density setting also applies to the *Freeze* room.

RT60 Main

RT60 Main sets the reverberation time for a signal to decay by 60dB. Values correspond to the R20 *Renard scale*. Start and end values depend on the the *Room Size* parameter. Here's a sample of values: ... **1s**, **1.12s**, **1.25s**, **1.4s**, **1.6s** ...

Due to physical constraints of the acoustic models, there are room-size-dependent limits of RT60. In other words: the *spread* of min to max RT60 *scales* with the current setting of the Room Size parameter. The following table limits are enforced for *RT60 Main* by firmware, but never restrict potential runaways due to superimposed frequency-dependent RT60 settings:

- 1E0 m³: 0.01-1 sec
- 1E1 m³: 0.02-2 sec
- 1E2 m³: 0.05-5 sec
- 1E3 m³: 0.1-10 sec
- 1E4 m³: 0.2-20 sec
- 1E5 m³: 0.5-50 sec
- 1E6 m³: 1-100 sec

Beyond the highest numerical value, the special-case value **FREEZE** appears, which corresponds to the Freeze room. Here, no damping exists, and the RT60 is infinite. To mute or unmute all input to the Freeze room, use the *Gate Room* hotkey; to choke all signals within of the Freeze room, use the *Kill Room* hotkey.

Note: The QRS algorithm infinitely continues spawning fresh reverberation, even with RT60 set to FREEZE. No *loop* of previously-calculated samples is played. *Gate Room* will be automatically activated after entering the Freeze room (*»close door«*), and deactivated when leaving it (*»open door«*).

RT60 Low, RT60 High

RT60 Low and *RT60 High* designate the reverberation times towards low and high frequencies, respectively. Their values are: **0.1**, **0.16**, **0.25**, **0.4**, **0.63**, **LIN**, **1.4**, **2.5**, **4**, **6.3**, and **10**. As coefficients for *RT60 Main*, these values are unit-less.

The selected coefficient is strictly valid only for the edge frequency determined by the *Low Edge* and *High Edge* parameters. The decay times change vs. frequency in a *continuous manner*. They typically increase for low frequencies, and decrease in the high frequencies.

Low Edge, High Edge

The *Low Edge* (*RT60 edge frequency for low frequencies*) may be picked from **25Hz**, **40Hz**, **63Hz**, **100Hz**, **160Hz**, **250Hz**, **400Hz**, **630Hz**, and **1kHz**. The *High Edge* (*RT60 edge frequency for high frequencies*) may be picked from **1kHz**, **1.6kHz**, **2.5kHz**, **4kHz**, **6.3kHz**, **10kHz**, and **16kHz**.

With the QRS algorithm, there is no concept of *crossover* behavior for separating low, mid, and high frequency bands. Here, RT60 changes gradually vs. frequency, in a continuous manner. These edge parameters defines the frequency, at which the RT60 coefficient, as determined by the *RT60 Low* or *RT60 High* value, just *reaches* their predetermined value. Or should we say *intersects with*, as below and above that frequency point there is an additional run-out area with an additional x0.7/x1.4 of RT60 overshoot, where the factor loses its tilt, and eventually reaches 0 Hz or Fs/2 asymptotically.

These two parameters have been introduced with version 2.0. On versions 1.x, their values had been invariably fixed at **100Hz** and **5kHz**.

Bass Edge, Bass Gain

These two parameters have been introduced with version 2.0. The behavior in versions 1.x corresponds to a *Bass Gain* setting of **±0dB**.

Bass Edge specifies the 3dB edge frequency of a low-frequency filter in the reverberation path (*»2nd«*), which may be chosen from **10Hz**, **16Hz**, **25Hz**, **40Hz**, **63Hz**, **100Hz**, **160Hz**, **250Hz**, **400Hz**, **630Hz**, and **1kHz**. Don't confuse this issue with a cut-off filter – it's the left hand section of a shelving filter..

Because an important clue for the perception of large rooms is the room's response to shock pressure (*»door bangs«*), there is *no inherent low-cut filtering* within the QRS algorithm – it

operates down to DC for all digital-I/O devices. Learn more about this and the **Subsonic** setup parameter on p. 35 and in [FAQ 069](#).

Bass Gain specifies the impact, i.e. gain or loss in the diffuse path level, reached asymptotically at 0 Hz. You may pick from **-20dB**, **-18dB**, **-16dB**, **-14dB**, **-12dB**, **-10dB**, **-8dB**, **-6dB**, **-4dB**, **-2dB**, **±0dB**, **+2dB**, **+4dB**, **+6dB**, **+8dB**, **+10dB**, **+12dB**, **+14dB**, **+16dB**, **+18dB**, and **+20dB**. The specified dB value is being crossed at the cut-off frequency defined by the companion *Bass Edge* parameter, with another 3dB (x0.7/x1.4) of asymptotic run-out at 0 Hz.

Dry Level

Dry Level is a member of the seven auxiliary path parameters. *Dry* and *Ist* are dual auxiliary chains for relaying *one* (2492, 2493, 2496) or *four* (2498) stereo input pair(s) to any output pair, bypassing the simulated room with some rudimentary processing: level, delay, patching, and L/R swap.

Dry Level adjusts the direct signal path from **-30dB** to **±0dB** in steps of 1 dB, and can be disabled using **OFF**. Individual levels for each output channel pair can be set: **DryLEV12** for DigOut 1+2 (2493: Out L/R), **DryLEV34** for DigOut 3+4, **DryLEV56** for DigOut 5+6, **DryLEV78** for DigOut 7+8.

Note: There are various options to adjust Dry Level *for each channel separately*. One may mount the **DryLEV1**, **DryLEV2**, ... parameters under the **Menu Parameter Line Up** submenu item (p. 138 for navigation with knob and button pair) or, alternatively **Overview Parameter Line Up** (p. 140 for navigation with those tiny display toggle switches). Moreover, there's also separate access to left and right parameters from the manufacturer-defined MIDI tables. For web browser navigation, there's currently no splitting option of channel pairs available.

1st Level

1st Level is a member of the seven auxiliary path parameters. *Dry* and *Ist* are dual auxiliary chains for relaying *one* (2492, 2493, 2496) or *four* (2498) stereo input pair(s) to any output pair, bypassing the simulated room with some rudimentary processing: level, delay, patching, and L/R swap.

1st Level sets the level of the first reflection from **-30dB** to **±0dB** in steps of 1 dB, and can be disabled using **OFF**. Individual levels for each output channel pair can be set: **1stLEV12** for DigOut 1+2 (2493: Out L/R), **1stLEV34** for DigOut 3+4, **1stLEV56** for DigOut 5+6, **1stLEV78** for DigOut 7+8. More on this in [FAQ 024](#).

Note: There are various options to adjust 1st Level *for each channel separately*. One may mount the **1stLEV1**, **1stLEV2**, ... parameters under the **Menu Parameter Line Up** submenu item (p. 138 for navigation with knob and button pair) or, alternatively **Overview Parameter Line Up** (p. 140 for navigation with those tiny display toggle switches). Moreover, there's also

separate access to left and right parameters from the manufacturer-defined MIDI tables. For web browser navigation, there's currently no splitting option of channel pairs available.

Warning: Contrary to the direct path, the QRS algorithm interchanges left/right channels for the first reflection path. Setting both paths to equal delay times and same levels would result in an unmeant mono mix-down. To resolve this problem, try skewing the delays appropriately with parameter *1st Dly* \pm . See more of this on p. 28.

2nd Level

2nd Level is a member of the four postprocessing parameters used for stereo or surround processing of the reverberant output signals from the simulated room. For each output pair, there's some rudimentary postprocessing: level, delay, bandwidth, correlation.

2nd Level adjusts the level of the reverberant paths' level from **-30dB** to **\pm 0dB** in steps of 1 dB, and can be disabled using **OFF**. Individual levels for each output channel pair can be set: **2ndLEV12** for DigOut 1+2 (2493: Out L/R), **2ndLEV34** for DigOut 3+4, **2ndLEV56** for DigOut 5+6, **2ndLEV78** for DigOut 7+8.

Note: There are various options to adjust 2nd Level *for each channel separately*. One may mount the **2ndLEV1**, **2ndLEV2**, ... parameters under the **Menu Parameter Line Up** submenu item (p. 138 for navigation with knob and button pair) or, alternatively **Overview Parameter Line Up** (p. 140 for navigation with those tiny display toggle switches). Moreover, there's also separate access to left and right parameters from the manufacturer-defined MIDI tables. For web browser navigation, there's currently no splitting option of channel pairs available.

Dry Delay

Dry Delay is a member of the seven auxiliary path parameters. *Dry* and *1st* are dual auxiliary chains for relaying *one* (2492, 2493, 2496) or *four* (2498) stereo input pair(s) to any output pair, bypassing the simulated room with some rudimentary processing: level, delay, patching, and L/R swap.

Dry Delay adjusts the delay of the direct signal path from **1ms** to **250ms** in 1ms steps. Individual levels for each output channel pair can be set: **DryDLY12** for DigOut 1+2 (2493: Out L/R), **DryDLY34** for DigOut 3+4, **DryDLY56** for DigOut 5+6, **DryDLY78** for DigOut 7+8.

Note: There are various options to adjust Dry Delay *for each channel separately*. One may mount the **DryDLY1**, **DryDLY2**, ... parameters under the **Menu Parameter Line Up** submenu item (p. 138 for navigation with knob and button pair) or, alternatively **Overview Parameter Line Up** (p. 140 for navigation with those tiny display toggle switches). Moreover, there's also separate access to left and right parameters from the manufacturer-defined MIDI tables. For web browser navigation, there's currently no splitting option of channel pairs available.

1st Delay, 1st Delay±

1st Delay and *1st Delay±* are members of the seven auxiliary path parameters. *Dry* and *1st* are dual auxiliary chains for relaying *one* (2492, 2493, 2496) or *four* (2498) stereo input pair(s) to any output pair, bypassing the simulated room with some rudimentary processing: level, delay, patching, and L/R swap.

1st Delay adjusts the delay of the first reflection from **1ms** to **250ms** in 1ms steps. Individual delays for each output channel pair can be set: **1stDLY12** for DigOut 1+2 (2493: Out L/R), **1stDLY34** for DigOut 3+4, **1stDLY56** for DigOut 5+6, **1stDLY78** for DigOut 7+8. More on this in [FAQ 024](#).

Version 2.3 (and above) offers a new parameter: *1st Delay±*. It adjusts the first reflection signal paths' delays on odd/left channels only. All corresponding even/right channels will be unaffected. Within the context of first reflection, parameter *1st Delay±* adjusts the left-channels' timing offsets between a stereo pair's left and right channel from **-50ms** to **+50ms** in 1ms steps. Individual delay offsets for each output channel pair can be set: **1stDLY1±** for DigOut 1+2 (2493: Out L/R), **1stDLY3±** for DigOut 3+4, **1stDLY5±** for DigOut 5+6, **1stDLY7±** for DigOut 7+8.

Background: To simulate hard near-field reflections for speaking voices, our Dialog Library makes extensive use of cross-channel echoes. Without intentionally *unequal* propagation delay times, a cross-channel echo would lose its pronounced spaciality whenever the panpots of the various input signals would be turned *away* from their left and right extremes (i.e. towards the center). In a panpot center position, matching delays would collapse the stereo image, as mono is still mono, even crosswise. To solve this problem, try skewing the delays appropriately with the *1st Delay±* parameter.

Note: Adding timing offset from the *1st Delay±* parameter cannot surpass the *1st Delay* range limits of 1ms and 250ms. In other words: if parameter *1st Delay±* is not set to midpoint (± 0 ms), basic *1st Delay* spread may be restricted (51ms .. 200ms); To get the full range of the *1st Delay±* offset, the basic *1st Delay* has to be set to a value between 51ms and 200ms.

Note: There are various options to adjust 1st Delay *for each channel separately*. One may mount the **1stDLY1**, **1stDLY2**, ... parameters under the **Menu Parameter Line Up** submenu item (p. 138 for navigation with knob and button pair) or, alternatively **Overview Parameter Line Up** (p. 140 for navigation with those tiny display toggle switches). Moreover, there's also separate access to left and right parameters from the manufacturer-defined MIDI tables. The combination of *1st Delay* and *1st Delay±* is currently the only splitting option available for web browsers navigation.

Warning: Contrary to the direct path, the QRS algorithm interchanges left/right channels for the first reflection path. Setting both paths to equal delay times and same levels would result in an unmeant mono mix-down. To resolve this problem, try skewing the delays appropriately with parameter *1st Dly±*.

2nd Delay

Note: To distinguish *predelay/postdelay* see [FAQ 060](#).

2nd Delay is a member of the four postprocessing parameters used for stereo or surround processing of the reverberant output signals from the simulated room. For each output pair, there's some rudimentary postprocessing: level, delay, bandwidth, correlation.

2nd Delay adjusts the reverberant paths' postdelays from **1ms** to **250ms** in 1ms steps. Individual delays for each output channel pair can be set: **2ndDLY12** for DigOut 1+2 (2493: Out L/R), **2ndDLY34** for DigOut 3+4, **2ndDLY56** for DigOut 5+6, **2ndDLY78** for DigOut 7+8.

Note: There are various options to adjust 2nd Delay *for each channel separately*. One may mount the **2ndDLY1**, **2ndDLY2**, ... parameters under the **Menu Parameter Line Up** submenu item (p. 138 for navigation with knob and button pair) or, alternatively **Overview Parameter Line Up** (p. 140 for navigation with those tiny display toggle switches). Moreover, there's also separate access to left and right parameters from the manufacturer-defined MIDI tables. For web browser navigation, there's currently no splitting option of channel pairs available.

2nd Cut

2nd Cut is a member of the four postprocessing parameters used for stereo or surround processing of the reverberant output signals from the simulated room. For each output pair, there's some rudimentary postprocessing: level, delay, bandwidth, correlation.

2nd Cut adjusts the reverberant paths' bandwidths from **2.5kHz**, **3.1kHz**, **4kHz**, **5kHz**, **6.3kHz**, **8kHz**, **10kHz**, **12kHz**, **16kHz**, to **NONE**. The filter values correspond to the *Renard scale*, but are rounded down for display reasons. The slope steepness is a constant *24 dB per octave*, the timing is *Bessel*. Individual bandwidths for each output channel pair can be set: **2ndCUT12** for DigOut 1+2 (2493: Out L/R), **2ndCUT34** for DigOut 3+4, **2ndCUT56** for DigOut 5+6, and **2ndCUT78** for DigOut 7+8.

Note: There are various options to adjust 2nd Cut *for each channel separately*. One may mount the **2ndCUT1**, **2ndCUT2**, ... parameters under the **Menu Parameter Line Up** submenu item (p. 138 for navigation with knob and button pair) or, alternatively **Overview Parameter Line Up** (p. 140 for navigation with those tiny display toggle switches). Moreover, there's also separate access to left and right parameters from the manufacturer-defined MIDI tables. For web browser navigation, there's currently no splitting option of channel pairs available.

2nd Correlation

2nd Correlation is a member of the four postprocessing parameters used for stereo or surround processing of the reverberant output signals from the simulated room. For each output pair, there's some rudimentary postprocessing: level, delay, bandwidth, correlation.

2nd Correlation defines the *channel-to-channel correlation*, i.e. an intentional *pairwise crosstalk* between the outputs of -0.5 , -0.25 , ± 0 , 0.25 , and 0.5 . This will either narrow the stereo image, or compensate an acoustic crosstalk between left and right speaker. For headphones, there's no practical use in deviating from the default of ± 0 , as doing so would severely puzzle aural perception. It's highly recommended to monitor the audio with a vectorscope whenever skewing correlation.

Individual correlation for each output channel pair can be set: **2ndCOR12** for DigOut 1+2 (2493: Out L/R), **2ndCOR34** for DigOut 3+4, **2ndCOR56** for DigOut 5+6, and **2ndCOR78** for DigOut 7+8. Correlation settings embedded within library Presets may be globally overridden from **System Setup**. See more details in the **Override Correlation** submenu item (p. 36 and pp. 127).

This parameter exists only since version 2.0. In 1.x versions, the value was fixed to ± 0 .

Dry Source

Dry Source is a member of the seven auxiliary path parameters. *Dry* and *Ist* are dual auxiliary chains for relaying *one* (2492, 2493, 2496) or *four* (2498) stereo input pair(s) to any output pair, bypassing the simulated room with some rudimentary processing: level, delay, patching, and L/R swap.

Dry Source assigns which channel patch will be used for a certain output's *Dry Level* and *Dry Delay* parameters. The output channels are joint L/R pairs. **DrySRC12** controls DigOut 1+2 (2493: Out L/R), **DrySRC34** controls DigOut 3+4, **DrySRC56** controls DigOut 5+6, **DrySRC78** controls DigOut 7+8. Input pairs may be assigned to output pairs. The mappings available are **12**, **21**, **34**, **43**, **56**, **65**, **78**, and **87**. Those eight sources are always assignable, even if a unit or plug-in does provide 2 input channels only. This permits using and maintaining surround plug-ins even on stereo-only devices.

Note: There are various options to define the mapping *for each channel separately*. One may mount the **DrySRC1**, **DrySRC2**, ... parameters under the **Menu Parameter Line Up** submenu item (p. 138 for navigation with knob and button pair) or, alternatively **Overview Parameter Line Up** (p. 140 for navigation with those tiny display toggle switches). Moreover, there's also separate access to left and right parameters from the manufacturer-defined MIDI tables. For web browser navigation, there's currently no splitting option of channel pairs available.

Note: In 2→x operation mode, inputs 3 to 8 will never be fed by audio signals. To prevent output levels from buckling due to dead inputs, all contradicting input settings may be compulsorily bent to

12 or **21**. See more details in the **Override Dry/1st Source** submenu item (p. 36 and pp. 130) .

This parameter has been introduced with version 2.0. In 1.x versions, input and output pairs have been assigned directly, i.e.: In1 – Out1, In2 – Out2, etc.

1st Source

1st Source is a member of the seven auxiliary path parameters. *Dry* and *1st* are dual auxiliary chains for relaying *one* (2492, 2493, 2496) or *four* (2498) stereo input pair(s) to any output pair, bypassing the simulated room with some rudimentary processing: level, delay, patching, and L/R swap.

1st Source assigns which *channel patch* will be used for a certain output's *1st Level* and *1st Delay* parameters. The output channels are joint L/R pairs. **1stSRC12** controls DigOut 1+2 (2493: Out L/R), **1stSRC34** controls DigOut 3+4, **1stSRC56** controls DigOut 5+6, **1stSRC78** controls DigOut 7+8. Input pairs may be assigned to output pairs. The mappings available are **12**, **21**, **34**, **43**, **56**, **65**, **78**, and **87**. Those eight sources are always assignable, even if a unit or plug-in does provide 2 input channels only. This permits using and maintaining surround plug-ins even on stereo-only devices. More on this in [FAQ 024](#).

Note: There are various options to define the mapping *for each channel separately*. One may mount the **1stSRC1**, **1stSRC2**, ... parameters under the **Menu Parameter Line Up** submenu item (p. 138 for navigation with knob and button pair) or, alternatively **Overview Parameter Line Up** (p. 140 for navigation with those tiny display toggle switches). Moreover, there's also separate access to left and right parameters from the manufacturer-defined MIDI tables. For web browser navigation, there's currently no splitting option of channel pairs available.

Note: In 2→x operation mode, inputs 3 to 8 will never be fed by audio signals. To prevent output levels from buckling due to dead inputs, all contradicting input settings may be compulsorily bent to **12** or **21**. See more details in the **Override Dry/1st Source** submenu item (p. 36 and pp. 130) .

This parameter has been introduced with version 2.0. In 1.x versions, input and output pairs have been assigned to the opposite channels, i.e.: In1 – Out2, In2 – Out1, In3 – Out4, etc.

Pre Level

Pre Level is a member of the three preprocessor parameters used for *phase-insensitively* feeding the unit with up to *eight* surround input signals (up to 7.1 or 8.0), or for staggering the depths of up to *four* stereo input pairs. For each input channel, there's some rudimentary preprocessing: level, delay, bandwidth. Due to the multiple inputs required, this parameter is available on the 2498 only. More on this in [FAQ 036](#).

Pre Level adjusts the feeding pairs' levels into the simulated room from **-30dB** to **±0dB** in steps of 1 dB, and can be disabled using **OFF**. Individual levels for each input channel pair can be set: **PreLEV12** for DigIn 1+2 (2493: In L/R), **PreLEV34** for DigIn 3+4, **DryLEV56** for DigIn 5+6, **DryLEV78** for DigIn 7+8.

Note: There are various options to adjust Pre Level *for each channel separately*. One may mount the **PreLEV1**, **PreLEV2**, ... parameters under the **Menu Parameter Line Up** submenu item (p. 138 for navigation with knob and button pair) or, alternatively **Overview Parameter Line Up** (p. 140 for navigation with those tiny display toggle switches). Moreover, there's also separate access to left and right parameters from the manufacturer-defined MIDI tables. For web browser navigation, there's currently no splitting option of channel pairs available.

Pre Delay

Note: To distinguish *predelay/postdelay* see [FAQ 060](#).

Pre Delay is a member of the three preprocessor parameters used for *phase-insensitively* feeding the unit with up to *eight* surround input signals (up to 7.1 or 8.0), or for staggering the depths of up to *four* stereo input pairs. For each input channel, there's some rudimentary preprocessing: level, delay, bandwidth. Due to the multiple inputs required, this parameter is available on the 2498 only. More on this in [FAQ 036](#).

Pre Delay adjusts the feeding pair's *predelays* into the simulated room from **1ms** to **250ms** in steps of 1ms. Individual delays for each input channel pair can be set: **PreDLY12** for DigIn 1+2 (2493: In L/R), **PreDLY34** for DigIn 3+4, **PreDLY56** for DigIn 5+6, and **PreDLY78** for DigIn 7+8.

Note: There are various options to adjust Pre Delay *of each channel separately*. One may mount the **PreDLY1**, **PreDLY2**, ... parameters under the **Menu Parameter Line Up** submenu item (p. 138 for navigation with knob and button pair) or, alternatively **Overview Parameter Line Up** (p. 140 for navigation with those tiny display toggle switches). Moreover, there's also separate access to left and right parameters from the manufacturer-defined MIDI tables. For web browser navigation, there's currently no splitting option of channel pairs available.

Pre Cut

Pre Cut is a member of the three preprocessor parameters used for *phase-insensitively* feeding the unit with up to *eight* surround input signals (up to 7.1 or 8.0), or for staggering the depths of up to *four* stereo input pairs. For each input channel, there's some rudimentary preprocessing: level, delay, bandwidth. Due to the multiple inputs required, this parameter is available on the 2498 only. More on this in [FAQ 036](#).

Pre Cut adjusts the feeding pairs' *bandwidths* into the simulated room from **2.5kHz**, **3.1kHz**, **4kHz**, **5kHz**, **6.3kHz**, **8kHz**, **10kHz**, **12kHz**, **16kHz**, to **NONE**. The slope steepness is a constant *24 dB per octave*, the timing is *Bessel*. Individual bandwidths for each input channel pair can be set: **PreCUT12** for DigIn 1+2 (2493: In L/R), **PreCUT34** for DigIn 3+4, **PreCUT56** for DigIn 5+6, and **PreCUT78** for DigIn 7+8.

Note: There are various options to adjust Pre Cut *for each channel separately*. One may mount the **PreCUT1**, **PreCUT2**, ... parameters under the **Menu Parameter Line Up** submenu item (p. 138 for navigation with knob and button pair) or, alternatively **Overview Parameter Line Up** (p. 140 for navigation with those tiny display toggle switches). Moreover, there's also separate access to left and right parameters from the manufacturer-defined MIDI tables. For web browser navigation, there's currently no splitting option of channel pairs available.

Effect Setup Parameters

Parameters with installation-dependent *set-and-forget values*, directly assigned to the active plug-in, are summarized under the **Effect** group of **System Setup** main menu. By name they are: *Discorrelator Pattern 2x*, *Discorrelator Pattern 88*, *Direct Path Enable*, *Subsonic*, *Override Correlation*, and *Override Dry/1st Source*. Another important setup parameter not associated with plug-ins is *Sample Rate Reference*, which is located within the **DIO1** (2492, 2496) or **DIO2** (2498) menu groups.

These parameters are *not* stored as part of a Preset, but stored as part of the plug-in's initialization. This separation of general and specific parameters makes it easy to accommodate an existing effects library to various application areas, e.g. 2-channel FOH, or 7-channel surround console – without need to get involved with the individual Presets.

Discorrelator Patterns 2x, Discorrelator Patterns 88

A *Discorrelator pattern* is a property of a *virtual room microphone*. All microphones within the reverberation chamber have a correlation of 50 % towards each other, but an individual discorrelation pattern. Its value would not need to be modified in standalone use.

However, if more microphones are desired than output channels available, the solution is to operate two or more YARDSTICKs in tandem. In this case, the discorrelator patterns of additional unit(s) will have to be accommodated.

For example, two 2496 units could be combined to simulate *a concert hall equipped with twelve microphones*, with an effective 50 % correlation factor against each other.

Note: Use only on stable and fully locked *digital* interfaces. On an analog I/O 2493, quartz crystal inaccuracies may result in phasing errors or beat frequencies.

Discorrelator Pattern 2x parameter assigns patterns for plug-ins and operation modes with 2 inputs and an unspecified number of output channels (currently 2, 6, or 8). *Discorrelator Pattern 88* parameter assigns patterns for plug-ins and operation modes with 8 inputs and 8 outputs – latter is available for the 2498 only.

For further information, please refer to the »Stereo and 3D Compatibility« section on p. 13.

Learn from pp. 117 and 120 how to force discorrelator pattern *globally* for all Presets.

Direct Path Enable

Direct Path Enable specifies whether the supplied direct signal will be forwarded to the output or not.

In the past, a direct path through an effects box was not available. It was customary to feed the direct path through the mixing console, ignoring that the effects would take a different and longer path. Today however, one would want to send direct signals through the effects processor as well, to minimize delay time deviations between direct and processed signal.

For further information on how to globally enable a direct path for all Presets, depending on the application, please refer to p. 123.

Subsonic

This parameter has been introduced with version 2.3.

Without DC suppression, there may be a gradual build-up of DC level for input signals with DC offsets. To be still able to process such deficient input signals, room resonances in the vicinity of air pressure shocks may optionally be suppressed.

For further information on globally enabling or disabling these resonances, please refer to p. 125.

Hands on – Infrasound

For input signals with significant DC offsets (say, more than 3 %), very-low frequency room resonances may gradually build up the DC level, then cross the clipping point, and eventually reach out well into the overdrive region.

To be still able to process such deficient input signals, room resonances in the vicinity of air pressure shocks defaults to being suppressed by a turned-off **Subsonic** parameter (p. 125). This default setting *does* introduce a 1 Hz cut-off filter and, as a consequence, turns *off* subsonic and DC processing. Feel free to *turn on* Subsonic whenever you need it, as long as you clearly know what you're doing. However, you need to be aware that DC offsets will not be tolerated.

Note: Due to inevitable cut-off capacitors on its ADC inputs, the analog-I/O 2493 has a fixed -3dB@10Hz low edge that circumvents subsonic and shock processing.

Override Correlation

This parameter has been introduced with version 2.0.

This parameter will be determined by the current monitoring environment: loudspeakers or headphones. For loudspeaker monitoring, it may occasionally make sense to reduce an image (positive values), or to partially cancel an acoustic crosstalk between left and right speaker (negative values). For headphone monitoring, the setting should always remain at 0 (neutral) – learn more arguments on p. 30.

An in-depth description on how to adjust this parameter globally for all Presets, can be found on p. 127.

Override Dry/1st Source

A Preset defined for operation mode 8→8 may be operated in 2→x mode. Depending on the setting within the Preset, the sources of direct path and first reflection may point to a dead (non-driven) input. With this parameter, when operated in mode 2→x, all contradicting settings may be temporarily bent over to the IN12 or SYNC12 inputs. If dead sources weren't bent, they unintentionally may get lost.

An in-depth description on how to adjust this parameter can be found on p. 130.

Freeze

This parameter has been introduced with version 4.0.

Using this parameter, the Freeze room behavior of direct path and first reflection can be set. Either both are muted, or maintain their settings from the Preset.

To set this parameter, please see p. 132.

Sample Rate Reference

This parameter sets the *nominal* sample rate. As a YARDSTICK can be operated with variable sample rate (*»varispeed«*), it becomes necessary to specify a *nominal* sample rate.

Automatic detection can fail if a varispeed sample rate is close to another (unrelated) standard value (e.g. a 48 kHz signal slowed to 44.1 kHz). Here, measurement would fail to detect a *nominal sample rate*. Workarounds include extracting the sample rate from the *Channel Status* data, or using a single fixed house sync.

This parameter also serves to initialize delay times and other processing constants within the plug-in algorithm. For further information on how to set the *source information* for this parameter, please refer to p. 164.

Front Panels

2492:



Fig. 9: 2492 Front panel

2493:



Fig. 10: 2493 Front panel

2496:



Fig. 11: 2496 Front panel

2498:



Fig. 12: 2498 Front panel

Displays

The front panel display elements consist of *Status and Bargraph LEDs*, the *Menu display*, and the *Overview display*.

Menu Display

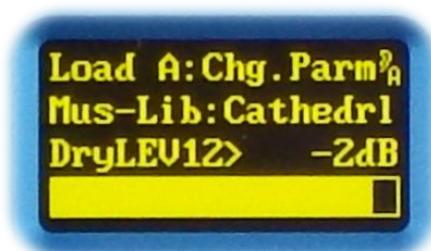


Fig. 13: Menu display

The *Menu display OLED* can display all settings and information related to the unit. Navigation is done using the scroll wheel and key pair switch (refer to section **Menu Navigation** on p. 48).

For further information on accessing the menus, please refer to the **Menu Structure** section on p. 95.

Overview Display



Fig. 14: Overview display

The *Overview display OLED* can display up to 14 parameters. It is also used to compare the settings of Presets in 2 columns. Display resolution can be set under **Display Mode**. Both **Param Up** and **Param Down** are used to page through parameters, whenever they cannot be displayed on one screen.

On the **2492** and **2493**, access to **Display Mode**, **Param Up** and **Param Down** is done using the **Hotkey Menu**, whereas the **2496** and **2498** use dedicated pushbuttons (refer to section **Function Keys** on p. 50).

If necessary, the Overview display provides additional status or error messages.

New 4.0 Status Messages

Under certain operating conditions, the Overview display will be superimposed with status messages similar to the **Hotkey Menu**:



Fig. 15: Status message Bypass

BYPASS

An activated Bypass is indicated – may be disabled via **Hotkey Menu**.

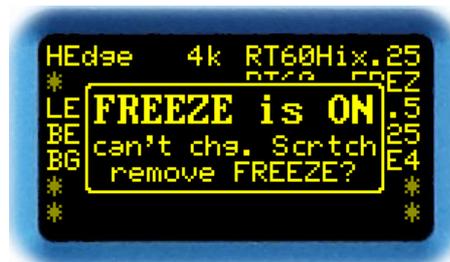


Fig. 16: Status message Freeze

FREEZE is ON

For a change in Room Size, or a re-initialization of the Scratch, the reverberation chamber needs to be rebuilt. If you are in Freeze room, all previously captured sound events would be destroyed. Triggering actions are therefore blocked, and this notice appears.

For the same reason, it makes no sense to store a Freeze room as a Preset. Any attempt to *save with FREEZE enabled* will be prevented with a note: **can't save Scratch**.

Error Messages

New
4.0

In certain operating conditions, the Overview display will be superimposed with error messages similar to the **Hotkey Menu**:

Each plug-in has a maximum sample rate. While exceeded, the following display appears:



Fig. 17: Plug-in sample rate error

Plug-in overrun The plug-in cannot handle the currently supplied sample rate. The sample rate measured by a frequency counter is indicated with the frequency LEDs, or by the **Show Sample Rate** menu item.

The I/O module (DIO2) of a 2498 can handle a maximum of 108 kHz. At higher frequencies, there will be an error message:



Fig. 18: Hardware sample rate error

DIO2 HW overrun The selected clock input drives the unit with an excessive sample rate. The sample rate measured by a frequency counter is indicated with the frequency LEDs, or the **Show Sample Rate** menu item.

MIDI errors or MIDI SysEx errors are explained in **MIDI Error Count** (pp. 180). Details are given in the *249x MIDI interface* document, which is available for download under www.quantec.com?dl_manuals.



Fig. 19: MIDI error

The audio interface of the analog 2493 consist of several modules. Each reports its own error messages. Depending on the modules involved, the messages may differ from those shown here.



Fig. 20: 2493 alert

- WetPcb try later** Common Mode servo loop of input **i** exceeds the control range by **x%**. If a cold unit is brought from the car to a warm room, condensation may form on the board and trigger this message. When the unit has reached room temperature, the error message should no longer appear.
- CML i: x%**
- AIO1 HW Error** Voltages (**VL+**, **VA+**, **VA-**, **Vref**) or frequencies (**LLFreq**), outside the valid range are shown. These error messages can be caused by devices connected to the input or output. Only if the error message persists after all cables have been disconnect, this alert signals a device error.
- ADC1 HW Error**
- DAC1 HW Error**
- Line o OVR x°C** The temperature **x** of the output driver **o** is too high. Check for output overload or blocked ventilation holes. Both channels are always displayed simultaneously. If the temperature is acceptable, **OVR** changes to **OK**.
- Line L/R OVERLOAD** An output driver is overloaded due to excessive load current, which turns off the output. An output operated within specifications is displayed as **OK**.

If the Real Time Clock is to be synchronized by a time server, the 249x will periodically attempt to contact it. If there is no response within a certain time, this error message appears. More information within the **Time Server** menu item description (p. 193).



Fig. 21: RTC alert

Status LEDs



Fig. 22: 2492 Status LEDs



Fig. 23: 2496 Status LEDs

Input/Output Levels Each input and output channel has its own bargraph. Resolution and orientation are unit-dependent.

2492 and **2493** have horizontal bargraphs with green LEDs at **-80dB**, **-60dB**, **-40dB**, **-20dB**, **-15dB** and **-12dB**, and yellow LEDs at **-9dB**, **-6dB**, **-3dB**, and **-1dB**.

A **2496** has vertical bargraphs with green LEDs at **-60dB** and **-20dB**, and yellow LEDs at **-9dB**, **-6dB** and **-3dB**.

A **2498** has vertical bargraphs with green LEDs at **-60dB**, **-40dB** and **-20dB**, and yellow LEDs at **-9dB**, **-6dB** and **-3dB**.

The top LED of all units lights red at **-0.1 dB**. While **Mute Dry**, **Mute 1st**, or **Mute 2nd** are active, the bottom bargraph LED becomes red. While **Bypass** is active, the bargraph displays a wandering dot.

232/MIDI

If a data packet is received via RS-232 or MIDI interface, the LED flashes green briefly. If the LED flashes red, a packet error has occurred. On the Overview display, an appropriate error message will be displayed (see p. 41). Details are explained in the **249x MIDI interface** document, which is available for download under www.quantec.com?dl_manuals

USB/ETH

If a data packet is received via USB or Ethernet interface, the LED flashes green briefly. If the LED flashes red, a packet error (see e.g. **Time Server** p. 193) has occurred. On the Overview display, an appropriate error message will be displayed (see p. 41)

S1/S2

As yet unassigned effect-specific LEDs for future use by plug-ins, e.g. *Compressor threshold* or *Flanger speed*

- ext/sync** Depending on LED color, shows the status of the external clock. For **2492** and **2496**, this LED shows lock status of the AES3 audio input. For **2498**, this LED shows lock status of the SYNC input. Green: unit is slaved to a stable external clock presented to one of its inputs. Flashing red: an expected external clock is missing. Random flickering or solid red: the expected external clock is corrupted. In this case, reading **Input Error Mask** (p. 157) will give an indication of the nature of the error. Off: unit generates its own master clock, and no clock is detected at the inputs.
- int** A green LED indicates that the internal clock is active. The LED turns off when no internal clock is being generated, implying the *need* for an external clock.
- 44/48/x2/x4** Indicates the sample rate used: **44** stands for 44.1 kHz, **48** for 48 kHz, **x2** for a factor of 2, and **x4** for a factor of 4. Green LEDs indicate the standard rates of 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz, and 192 kHz – they turn yellow when *varispeed* is used. More than one LED can be yellow at the same time if the actual rate is close between two frequencies, e.g. a 46 kHz clock would have both **44** and **48** LEDs lit yellow.
- Flashing indicates a contradiction between the frequency counter and the statements from Channel Status data. (Please refer to Sample Rate Reference menu item on p. 164).**
- A slow flashing red LED indicates that the sample rate is higher than what the hardware (the unit) or software (a plug-in) has been designed for.**

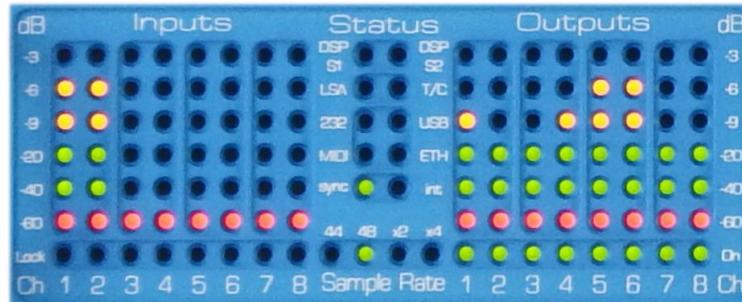


Fig. 24: 2498 Status LEDs

- Lock** On a **2498**, there is a *Lock* LED for every single input. A green LED indicates a fault-free signal at the corresponding input. An occasional red flashing, or a permanent red LED indicates a marginal, or faulty input signal.
- On** On a **2498**, there is an *On* LED for every single output. A green LED indicates that this output emits an AES3 audio signal, or empty AES3 frames. The LED doesn't implicate an audio signal; audio will be signaled by the bargraph.



Fig. 25: 2493 Status LEDs

- 48/96/192** With these LEDs, a **2493** visualizes the sample rate of the internal quartz clock master, which is also supplied to the plug-in. The sample rate cannot arbitrarily be chosen, as it is defined by the plug-in. More details in [FAQ 071](#).
- flat/steep** On a **2493**, this LED reports the currently activated A/D and D/A converters' antialiasing filters. For **96 kHz** and **192 kHz**, the **flat** filter is invariably forced. For **48 kHz**, **steep** (*»Quantec in-house standard«*) and **flat** (*»problematic industry standard«*) filters can be chosen from the **Antialiasing Filter** menu item. When operated in Bypass mode, highly interesting blind tests with A/B comparison can be performed. More details on p. 70 and in [FAQ 058](#)
- cal** If this LED is on, the **2493** AD/DA converters are subjected to a calibration process.

Operational Controls

There are a number of different approaches to operate a YARDSTICK. **Each method is self-contained and comprehensive**, i.e. allows the operation of the YARDSTICK in its entire range of functions.

It is particularly impressive that all these operating interfaces can be used **simultaneously**, because they always remain **synchronous** to each other. So you could select a parameter with the *toggle keys*, but then, because of the advantageous haptics, use the *front panel scroll wheel* to slide up and down the scales (feels much better than mouse wheel).

In the following two chapters, the two operating concepts based on front panel controls will be explained in more detail. Operating concepts based on remote controls will follow in later chapters, or even own documents.

Front Panel Operating Concept 1 – Menu navigation

To control the left-hand Menu display, there are three elements on the very right of the front panel: a large scroll wheel, and two blue buttons with **ENT**, **XIT**, and **TOG** functions.

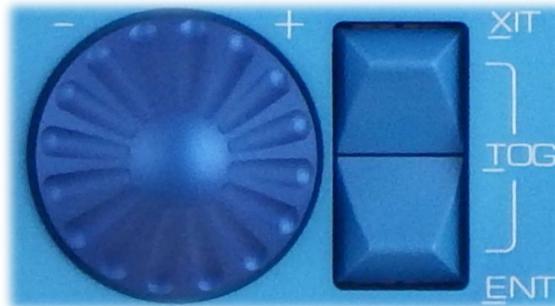


Fig. 26: Controls for menu navigation

Operating concept 1 is a *hierarchical* menu navigation with **scroll wheel** and **ENTER/EXIT** keys. The idea is that **ENTER** and **EXIT** keys open or close a hierarchy level, while the wheel moves horizontally within the currently selected hierarchy level.

Wheel	Used to move the menu cursor left or right, to select a Preset, or to modify a parameter value.
XIT	The XIT (=EXIT) function is obtained by tapping the top key. It moves the menu cursor up, or cancels a parameter value. The XIT control is executed on <i>release</i> of the key, to enable detecting of the TOG function.
ENT	The ENT (=ENTER) function is obtained by tapping the bottom key. It moves the menu cursor down, or confirms a parameter value. The ENT control is executed on <i>release</i> of the key, to enable detecting of the TOG function.
TOG	The TOG (=TOGGLE) function is obtained by tapping one key while the other is being held. Simultaneous tapping works as well. The TOG function selects the Hotkey Menu . In addition, it is used in certain menus for special selection, such as changing the cursor character. Contrary to the ENT and XIT function, the TOG function is executed as soon as the second key is <i>hit</i> .

Note: The menu structure is reminiscent of its ancestor, the original 2402 YARDSTICK. Considering the added A/B comparisons possible with Scratch A and Scratch B, we are well aware that with amendments like these, an experienced 2402 user (but 249x operations guide refusenik) may initially be confused.

Front Panel Operating Concept 2 – Parameter changes directly from Overview display

For all YARDSTICKs, the Overview display is used to concurrently display a large number of plug-in parameters.

For **2496** and **2498**, the Overview display is being surrounded by 10 illuminated pushbuttons (top and bottom), as well as 14 toggle keys operating left-to-right (one step -/+), and snapping back when released. The operating elements are grouped into *Mute* and *Function keys*, as well as *Parameter toggles*.

Both **2492** and **2493** are devoid of all those additional operating elements. Here, the illuminated push button functionality is being replaced by the **Hotkey menu** (see p. 97).



Fig. 27: Controls around Overview display

Operating concept 2 allows *direct* access via **14 toggle keys** and **10 push buttons**. It is a very convenient way to **audibly optimize two or three parameters towards a given target, in no more than a few seconds**.

But there is one serious drawback with Concept 2: you literally need to remain face to face with your unit's front panel displays. Hiding your YARDSTICK within the bottom slot of your outboard rack will definitely not work!

Note: With **Follow Me** (see p. 143), the advantages of both concepts can be combined. Having selected a parameter with its toggle key, proceed with fine-tuning by turning the scroll wheel. Possibly not obvious at first glance, this combinatorical approach emulates the operation of the **original 1982 QRS** – with both its central knob and its [-] [+] pushbuttons.

Note: The parameter settings of the two operating concepts (menu navigation and toggle keys) behave as two *competing* remote controls, i.e. one can make void the changes from the other. Specifically, this can happen while moving around through the menu navigation of **Select Slot A**, or while opening **Select Parameter A**. Depending on the setting of **Load Preset** (see p. 134), a toggle-key-modified, but not yet saved Preset will be silently reloaded from the archive; thus any interim toggle-key modifications will inadvertently be overwritten.

Mute Keys

The 5 push buttons with mute functions are located above the display. Their condition will be indicated by a red LED.

Gate room	Mutes the <i>input</i> to the reverb room. A red LED indicates <i>blocked input signal</i> . Note that already ongoing reverb behaves normally – i.e. remains audible within the reverb or Freeze room.
Kill room	Stops all signal generation produced by the reverb room. A red LED indicates kill is active. Even if fed with an input signal (as with Gate Room transparent), no echoes can be established within the room.
Mute Dry	Mutes the <i>output</i> of the direct signal. A red LED indicates Mute Dry is active. Mute status is also shown as a status LED. Moreover, this function is indicated by a red LED on the bargraph.
Mute 1st	Mutes the <i>output</i> of the first reflection. A red LED indicates Mute 1st is active. Mute status is also shown as a status LED. Moreover, this function is indicated by a red LED on the bargraph.
Mute 2nd	Mutes the <i>output</i> of the reverb room. Note that ongoing reverb (decaying or frozen) behaves normally – but will not be heard. Mute status is also shown as a status LED. Moreover, this function is indicated by a red LED on the bargraph.

Function Keys

The 5 push buttons are located below the display. They are partially equipped with an orange LED.

Menu Shortcut	Fast switchover between 4 menus being parked in background. Allows fast access to 4 virtual menu trees, simply by pushbutton.
Param Up Param Down	Scrolls up or down through the Overview display. An orange LED indicates that other parameter pages are available. The function is only active if there are more parameters than can be displayed on the display at once, and the top or bottom pages have not already been reached.
Change Scratch	Selects between <i>Scratch A</i> and <i>Scratch B</i> . Which one of the two Scratches is currently the active one is being displayed near the " <i>stylized ear</i> " in the Menu display (see p. 96).

Display Mode

Changes the mode of the Overview display. These are the display modes:



Fig. 28: 14 parameters with bargraphs

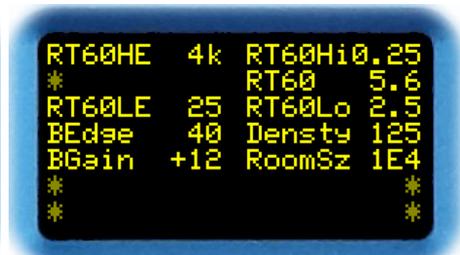


Fig. 29: 14 parameters without bargraphs



Fig. 30: 4 parameters

Note: If a parameter is grayed out (both name and value), it has been temporarily displaced by a superior setting in **System Setup** and cannot be edited. The currently active value will be shown, not the one stored in the Preset. An exception to this rule are *Dry Source* and *Ist Source*. Even if the Preset values are currently being displaced by a forced value from Setup, all *Source* parameters may still be assigned and maintained. The left hand, grayed out values are the forced ones, which are currently audible. The right-hand values represent the still accessible, and maintainable, Preset specifications for multi-channel operation.

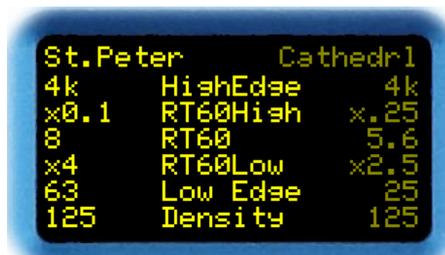


Fig. 31: 6 parameters compared



Fig. 32: 3 parameters compared

Note: The top line of all comparison display modes shows both Preset names. As Scratch B is never editable, it will appear grayed out.

Note: For *each one* of the parameter presentation variants, both *selection* and *arrangement* may be reorganized arbitrarily. Whenever a goof-proof YARDSTICK “for the janitor” is required, simply populate *one single page* in 4 parameter mode (Fig. 30) with 1 to 4 essential parameters. In contrast, a trained operator wants to verify lots of parameters “at a glimpse”, e.g. *everything of Channel 1+2*, or *all Predelays 1-8*. So he/she will preassign a gazillion of 14 parameter pages (Fig. 28 or 29) with useful arrangements, for a later access through the Hotkeys. See **Overview Parameter Line Up** (p. 140) for details.

Parameter Toggle Keys

The 14 toggle keys on both sides of the Overview display are used for direct access to parameters. They can be pushed left or right from their center positions, to decrease or increase a parameter value by a single step. With a little practice, you can easily adjust several parameters simultaneously. Holding the key will autorepeat the stepping. Depending on the display mode, the toggle keys are assigned as follows:

14 parameter swith or without additional bargraph

Each toggle key associated to a parameter.



Fig. 33: Toggle keys 14 parameters

4 parameters

Toggle keys 1, 3, 5 and 7 on the left side are associated with 4 parameters.



Fig. 34: Toggle keys 4 parameters

6 parameters in comparison

Toggle keys 2 to 7 on the left side are associated with 6 parameters of *Scratch A*. *Scratch B* cannot be edited, therefore the right toggle keys are inactive.



Fig. 35: Toggle keys 6 parameters

3 parameters in comparison

Toggle keys 3, 5 and 7 on the left side are associated with 3 parameters of *Scratch A*. *Scratch B* cannot be edited, therefore the right toggle keys are inactive.



Fig. 36: Toggle keys 3 parameters

Note: Empty parameter spaces are marked with *. The associated toggle key does not have any function.

Rear Panels

2492:



Fig. 37: 2492 Rear panel

2493:



Fig. 38: 2493 Rear panel

2496:



Fig. 39: 2496 Rear panel

2498:



Fig. 40: 2498 Rear panel

The rear panel hosts (from right to left) the *Audio Interfaces*, *Remote Data Interfaces*, and *Power Supply*.

Digital Audio Interfaces



Fig. 41: 2492 audio interface



Fig. 42: 2496 audio interface



Fig. 43: 2498 audio interface

AES3 Inputs

2492: One AES3 input signal is fed in via XLR chassis connector **Digital In**.

2496: One AES3 input signal is fed in via XLR chassis connector **DigIn 1+2**.

2498: One AES3 input signal is fed in via XLR chassis connector **SYNC**. Four additional AES3 inputs are available on its 25-way female DSUB connector **AES/EBU 8-Ch in / 8-Ch out**.

AES3 Outputs

2492: One AES3 output signal is fed out via XLR chassis connector **Digital Out**.

2496: Three AES3 output signals are fed out via XLR chassis connectors **DigOut 1+2**, **DigOut 3+4**, and **DigOut 5+6**.

2498: Four AES3 output signals are available on its 25-way female DSUB connector **AES/EBU 8-Ch in / 8-Ch out**.

XLR female connectors

The XLR female connectors are terminated with $110\ \Omega$. Pin 1 connects to the chassis via a $0.1\ \mu\text{F}$ capacitor, to prevent line-voltage ground loops.

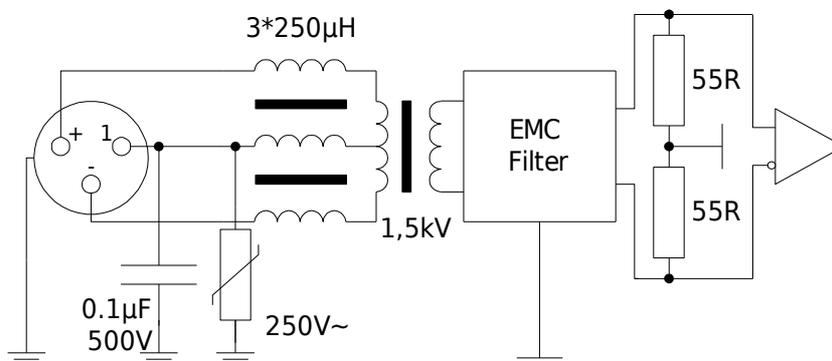


Fig. 44: digital XLR input circuit

XLR male connectors

The XLR male connectors deliver $5\ \text{V}_{\text{pp}}$ at $110\ \Omega$. Pin 1 connects directly to the chassis.

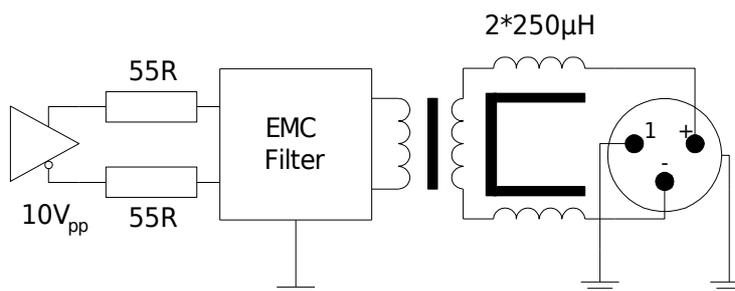


Fig. 45: digital XLR output circuit

DSUB female connector

On the DSUB connector, four AES3 inputs terminated with 110 Ω are combined with ...

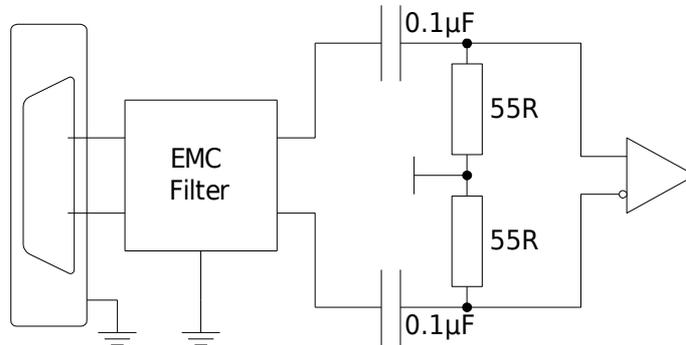


Fig. 46: Digital DSUB input circuit

... four AES3 outputs providing 5 Vpp at 110 Ω.

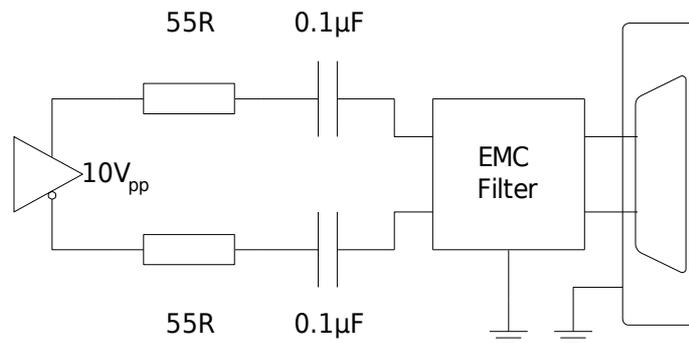


Fig. 47: Digital DSUB output circuit

By loosening the two hex bolts and rotating the DSUB connector, the pinning layouts for YAMAHA and TASCAM devices can be selected. Many more manufacturers are supporting one of these quasi standards. Please note: for female connectors (f) applies, for male (m).

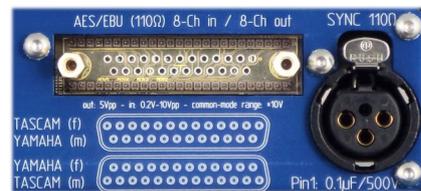


Fig. 48: 2498 without DSUB connector

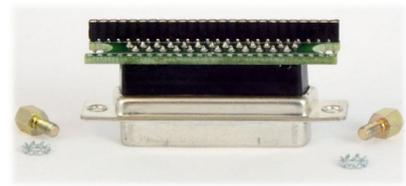


Fig. 49: Removed DSUB connector



Fig. 50: TASCAM pinout

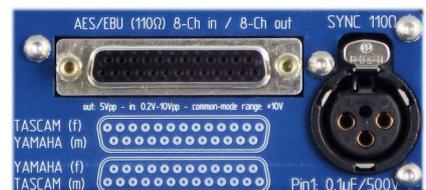


Fig. 51: YAMAHA pinout

By means of a supplied 3m breakout cable (*»snake«*), the inputs are available as XLR female connectors, and the outputs are available as XLR male connectors. The 2498 DSUB connector needs to be mounted to match the snake. Until 12/2013, all 2498 were equipped with snakes of the YAMAHA variant. Since TASCAM has been standardized as AES59 now, we deliver the TASCAM version since 1/2014. Recent snakes are labeled accordingly.



Fig. 52: Breakout cable

	 YAMAHA	 TASCAM
CH 1/2 IN +	1	24
CH 1/2 IN -	14	12
CH 1/2 IN SHIELD	10, 12, 13, 22, 23, 24, 25	25
CH 3/4 IN +	2	10
CH 3/4 IN -	15	23
CH 3/4 IN SHIELD	10, 12, 13, 22, 23, 24, 25	11
CH 5/6 IN +	3	21
CH 5/6 IN -	16	9
CH 5/6 IN SHIELD	10, 12, 13, 22, 23, 24, 25	22
CH 7/8 IN +	4	7
CH 7/8 IN -	17	20
CH 7/8 IN SHIELD	10, 12, 13, 22, 23, 24, 25	8
CH 1/2 OUT +	5	18
CH 1/2 OUT -	18	6
CH 1/2 OUT SHIELD	10, 12, 13, 22, 23, 24, 25	19
CH 3/4 OUT +	6	4
CH 3/4 OUT -	19	17
CH 3/4 OUT SHIELD	10, 12, 13, 22, 23, 24, 25	5
CH 5/6 OUT +	7	15
CH 5/6 OUT -	20	3
CH 5/6 OUT SHIELD	10, 12, 13, 22, 23, 24, 25	16
CH 7/8 OUT +	8	1
CH 7/8 OUT -	21	14
CH 7/8 OUT SHIELD	10, 12, 13, 22, 23, 24, 25	2
Not Connected	9,11	13
	Lynx Apogee Mackie TC	AES59 Digidesign Panasonic IZ Technology

Fig. 53: Female DSUB connector – pinout of digital I/O

Integration into an S/PDIF environment

S/PDIF output to AES/EBU input (»Effect Send«)

The main problem results from the S/PDIF signaling voltage, which is only one tenth compared to AES/EBU. Depending on the sample rate, the proposed circuits' usefulness may be limited to cable lengths of just a few feet!

The first circuit will operate with any YARDSTICK – **2492**, **2496**, and **2498**. A custom transformer is required, but its few turns can easily be stitched by hand. It's based on a ferrite toroid core with a diameter of 6.3 to 10 mm, and an A_L value of more than 2000. The S/PDIF primary requires 8, the AES/EBU secondary 10 turns of enameled or teflon-coated wire. Turning sense and polarity are irrelevant.

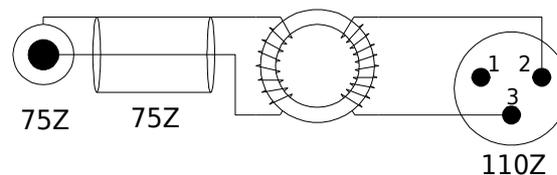


Fig. 54: S/PDIF-AES/EBU input adapter with transformer

For both **2492** and **2496**, there is an even simpler solution without any transformer. But this one works only there, not with the 2498.

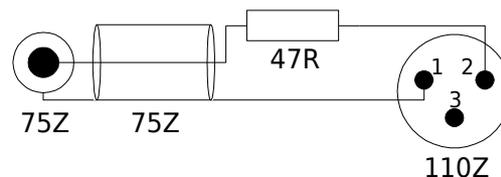


Fig. 55: S/PDIF-AES/EBU input adapter with resistor

2492, **2496**, and **2498** all recognize *Consumer* Channel Status format of such a retrofitted input. Any embedded sample rate data will be evaluated correctly. Incoming Channel Status information will be transparently forwarded to the outputs. An editing option does not exist for S/PDIF.

AES/EBU output to S/PDIF input (»Effect Return«)

For the case of the outputs, there are two electrically equivalent circuits, one with a Π and one with a T structure (pronounced pie and tea). Both may be used arbitrarily with any of the **2492**, **2496**, and **2498**. Both terminate the AES/EBU output with a balanced load of $110\ \Omega$. From the viewpoint of the S/PDIF input, both networks look like an unbalanced $75\ \Omega$ source with the correct voltage level.

Preferring one or the other may entirely be left to the currently available selection of resistor values at your repair shop.

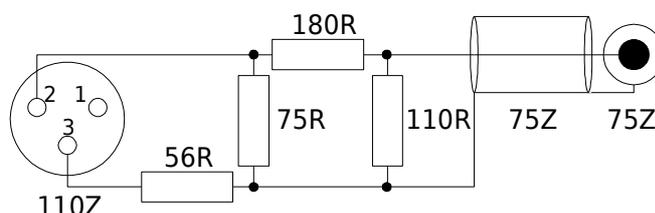


Fig. 56: AES/EBU-S/PDIF output adapter – Π structure

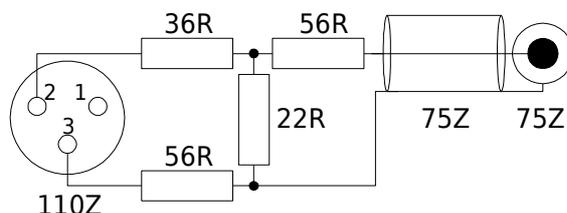


Fig. 57: AES/EBU-S/PDIF output adapter – T structure

Whenever the shield within the S/PDIF device is not grounded through the Cinch connector, the cable shield may alternatively be grounded at the AES/EBU end. Simply connect the cable shield to XLR pin 1. Don't ground both sides, as you will end in a mains power ground loop where high compensatory currents may flow.

As the output level margins are ample, the output cable length (i.e. the XLR end) is much less critical than the input cable length.

Note: The **2492**, **2496**, and **2498** output Channel Status format depends on the format on the input. When fed with *Consumer*, the unit will output *Consumer*, too. Any kind of mixed operation, such as *Consumer In*, *Professional Out*, or vice versa, is not supported.

New 4.0 Analog Audio Interfaces



Fig. 58: 2493 audio interface

analog inputs

2493: Two analog input signals are fed in via XLR chassis connectors **In L** and **In R**.

analog outputs

2493: Two analog output signals are fed out via XLR chassis connectors **Out L** and **Out R**.

XLR female connectors

The input circuit has a high common-mode input impedance of about 130 kΩ, so that any pairing mismatch of the driving circuit (output impedance, cable and connector) affects the CMRR only marginally. If a signal, referenced to ground, is supplied to the **[+]** input only and the GND pin 1, this high ground impedance would lead to a strong attenuation at the XLR input in asymmetric mode. For a low-impedance termination of the input, the unused **[-]** input of an *unbalanced operation* must be connected to GND (or another low-impedance source), too.

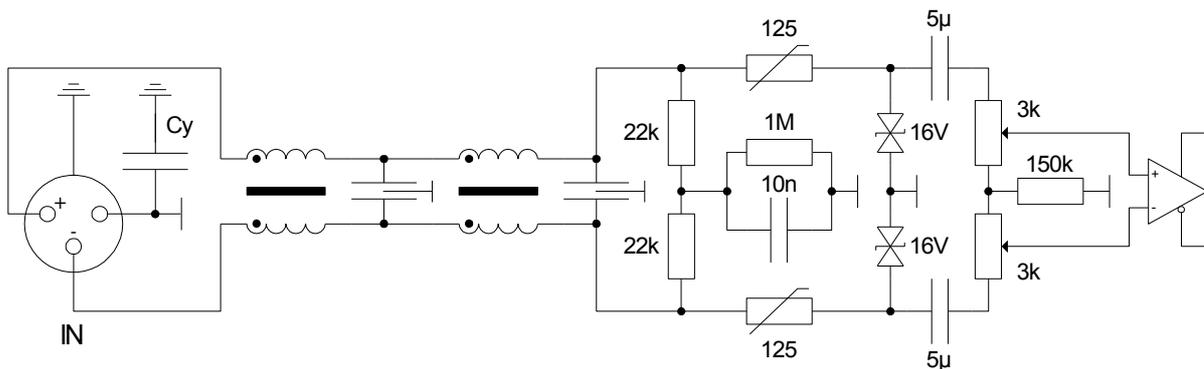


Fig. 59: Analog XLR input circuit

XLR male connectors

The outputs however provide a very low impedance signal to the [+] [-] pins, which is internally referenced to ground. This should not be confused with a driver circuit with (real or simulated) output transformer. *In unbalanced mode*, it is thus *not* allowed to connect the unused [-] output to ground. This would mean that the lower line driver would drive $20\ \Omega$ to ground. As our driver circuits can deliver peak currents of several 100 mA, such a ground fault would spontaneously trigger unexpected emergency shutdowns of the analog module during operation. On the other hand, it would be perfectly legitimate to drive *a second load* with the lower driver *at the same time*, e.g. (GND-based) headphones on the left and right [-] outputs.

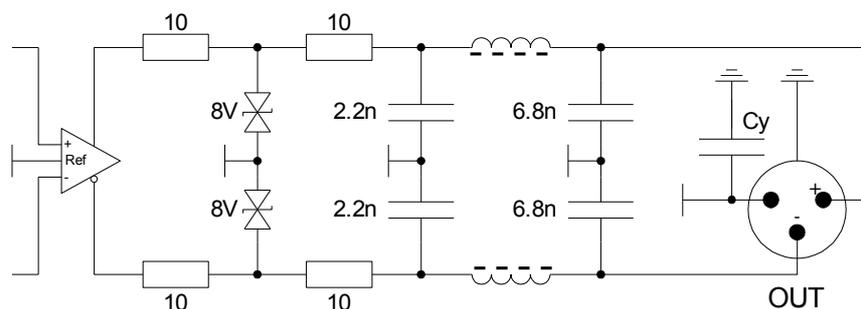


Fig. 60: Analog XLR output circuit

Ground-reference

To avoid ground loops, the ground of the entire analog module («*Floating GND*») is separated from the housing and protective earth («*Chassis GND*»). The illustrated 7 nF capacitor represents the 500V-capable Cys (e.g., Fig. 59 and Fig. 60) – installed across several locations within the analog module. The 2 M Ω resistor is used to discharge them.

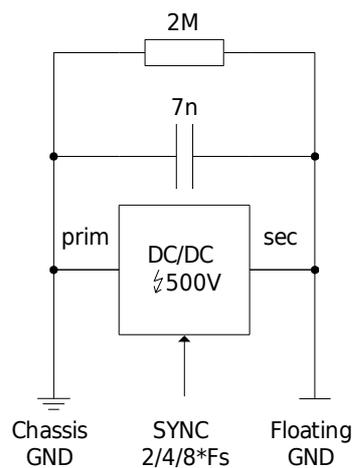


Fig. 61: Ground relations in analog I/O modules

YARDSTICK 2493 – Level vs. Frequency diagrams

All boundaries (shown in gray on the diagrams) are based on IRT Pflichtenheft 3/5 (Oct 1990).

Frequency Response

2493 - (c) Quantec 2011

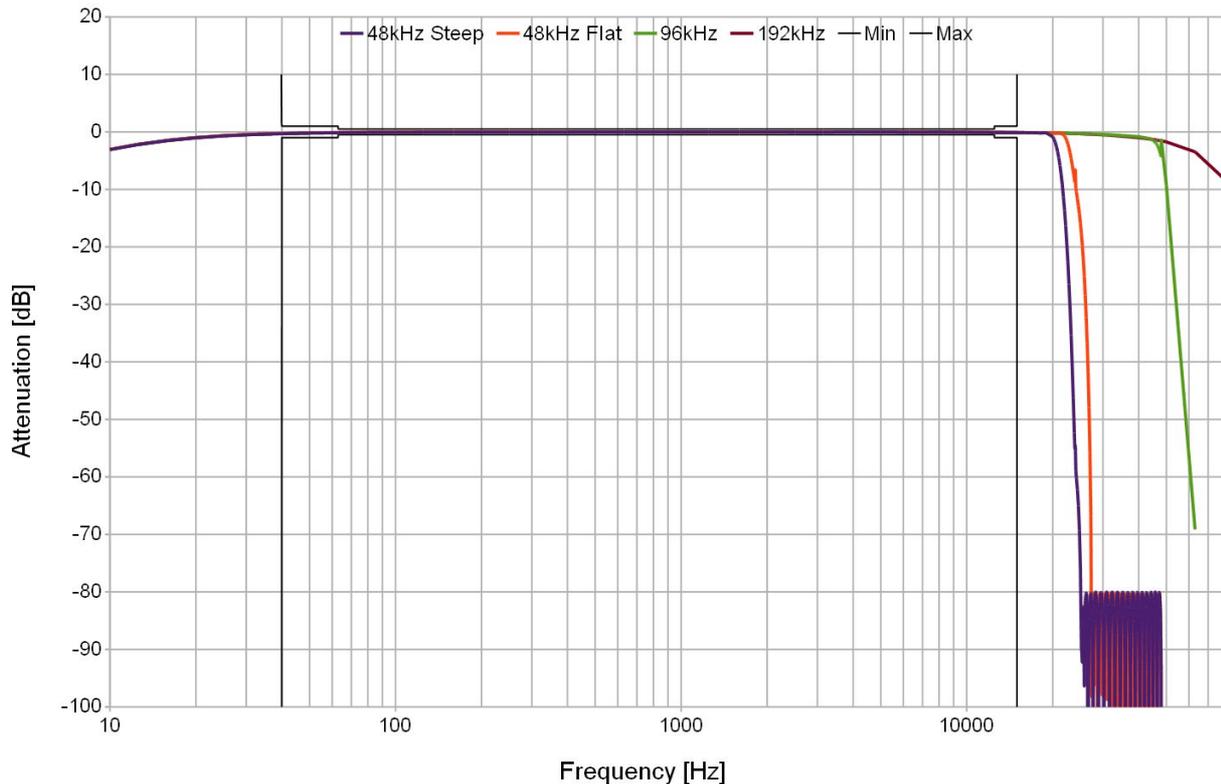


Fig. 62: Various sample rates (both »Steep« and »Flat« filters @ 48 kHz)

On some of our Level vs. Frequency diagrams, you may notice a small dent at exactly half the sample rate. Whenever you see such a dent, you may be all but certain that the frequency response has been recorded by wideband-measuring a *real-world unit*, and is *not* just a computer simulation result.

Note: All analog I/O measurements are referenced to the AD/DA's *floating local ground*, which is isolated from chassis or earth ground by a *low noise DC/DC converter (operating at the current sample rate)*. So there will be no gray zones by potential ground loops within the analog I/O wiring.

This dent is real and not a measurement artifact. For most frequencies, a mix of an *input tone F1* and its *mirror image F2* («alias») add as a vector sum, i.e. **+3 dB**. At $F_s/2$, both F1 and F2 are exactly 24 kHz, so their beat frequency F_2-F_1 goes to zero. If they were locked in phase, both $F_1=24$ kHz and $F_2=24$ kHz would add directly, peak on peak, i.e. **+6 dB**.

Frequency Response - Pass Band

2493 - (c) Quantec 2011

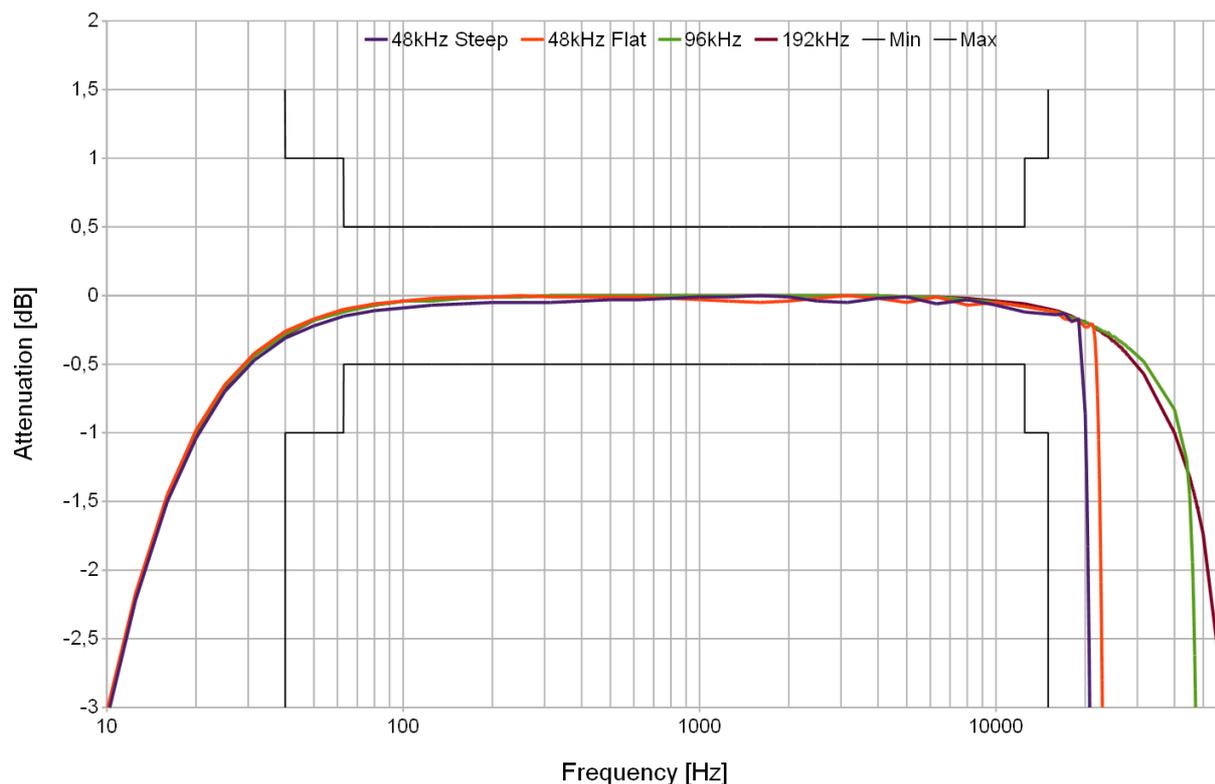


Fig. 63: Various sample rates (both «Steep» and «Flat» filters @ 48 kHz)

A similar effect hides behind the slight lateral displacement of the filter slope beyond $F_s/2$. As a level meter is no frequency-selective device, it cannot distinguish between F_1 and F_2 . So, whenever the levels of both F_1 and F_2 are the same order of magnitude, the level meter sees the vector sum of both, i.e. up to 3 dB more. This looks like the curve being bent towards slightly higher frequencies. Put simple: what seems to read $-55\text{dB}@24\text{kHz}$ in the magenta chart of Fig. 64 should be corrected to -58 dB .

Frequency Response - Stop Band

2493 - (c) Quantec 2011

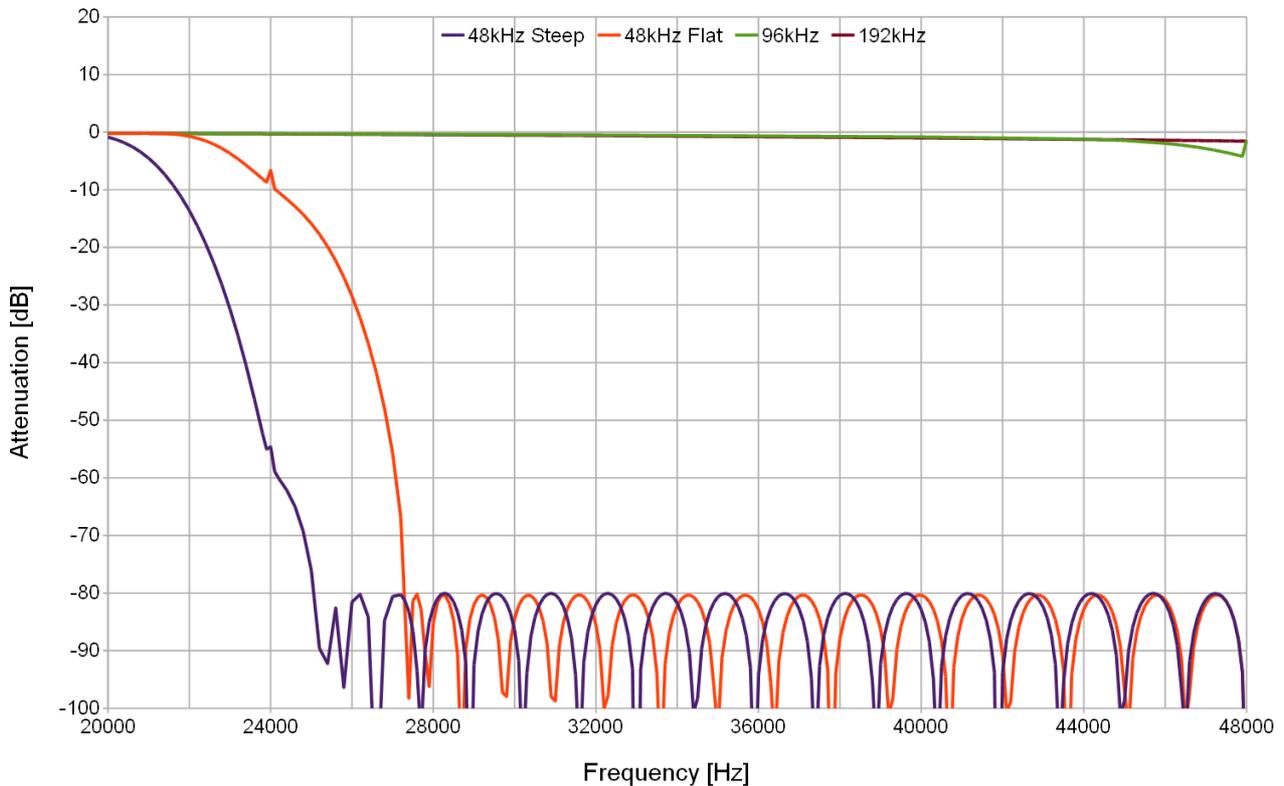


Fig. 64: Various sample rates – linear frequency axis

Both effects would disappear with a brickwall filter inserted in front of the level meter. But wouldn't that be euphemistic - as real-world installations would definitely go without such filters ...

Crosstalk vs. Frequency

2493 - (c) Quantec 2011

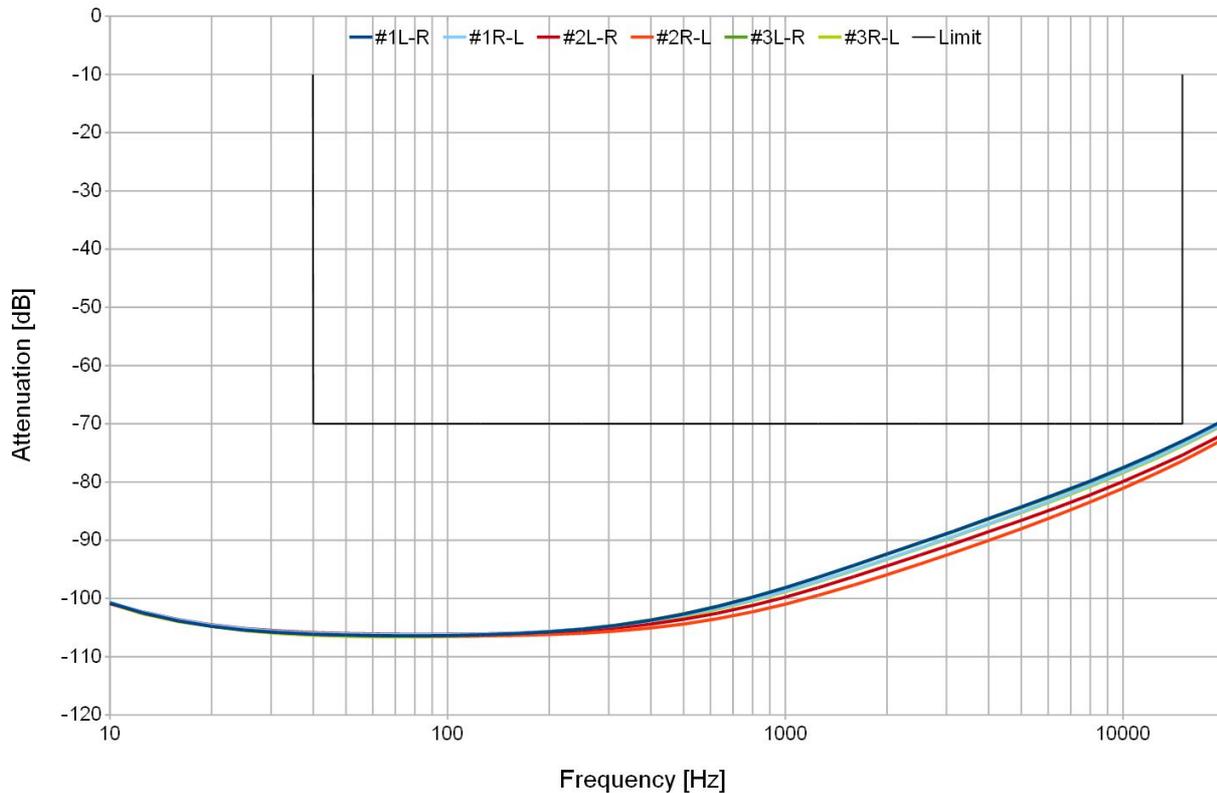


Fig. 65: L→R and R→L crosstalk (3 units tested)

New 4.0 YARDSTICK 2493 – Total Harmonic Distortion

All boundaries (shown in gray on the diagrams) are based on IRT Pflichtenheft 3/5 (Oct 1990).

THDN -1dB

2493 - (c) Quantec 2011

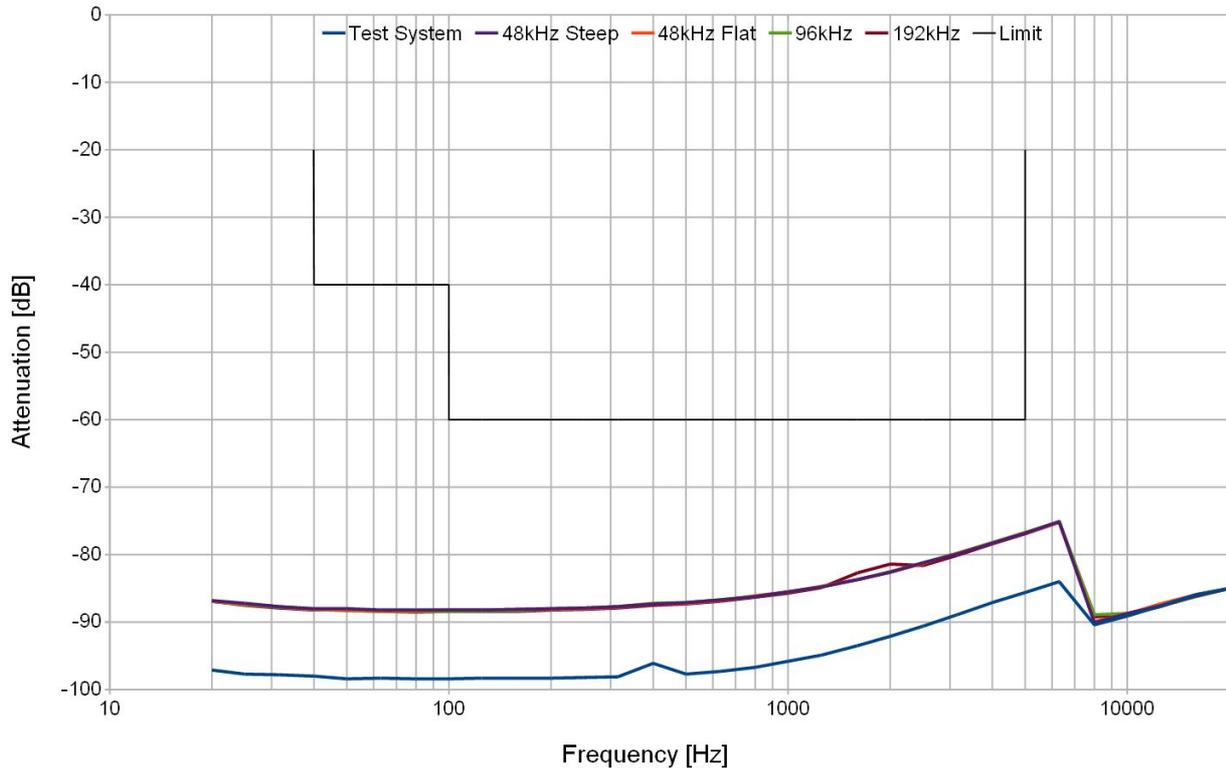


Fig. 66: Frequency-dependent THD+Noise near full-scale (300 Ω Load)

THD+Noise results are virtually identical for all test loads specified in IRT Pflichtenheft 3/5:

- 300 Ω
- 10 k Ω
- 10 k Ω || 10 nF

We're especially proud of the almost totally flat distortion behavior towards low frequencies – in spite of a 300 Ω load. As in the power supply, our *Zerolytics* technology – intentional *omission* of any electrolytic capacitors – has been applied here, too. While the entire audiophile globe continues discussing the sonic pros and cons of Black Gate, Manila hemp, tantalum, aluminum, or other electrolytic capacitor technologies ...

Please note that our THD tests beyond 6.3 kHz are not informative, due to our test instrument's limited bandwidth of 22 kHz. The effect shows up on the above diagram (Fig. 66), where there's a distinct down-step above 6.3 kHz. Such steps are quite common in audio op-amp or AD/DA converter data sheets ...

Here's the reason: starting gradually at roughly 1 kHz, the performance of both our sine-wave generator *and* the YARDSTICK become *slightly worse* than our THD test instrument. On the diagram below (Fig. 67), sine-wave generator *and* YARDSTICK perform *much better* than our THD test instrument, which, regardless of test frequency, practically records no more than its own wideband input noise; so any step near 6.3 kHz is totally masked-off.

THDN -60dB

2493 - (c) Quantec 2011

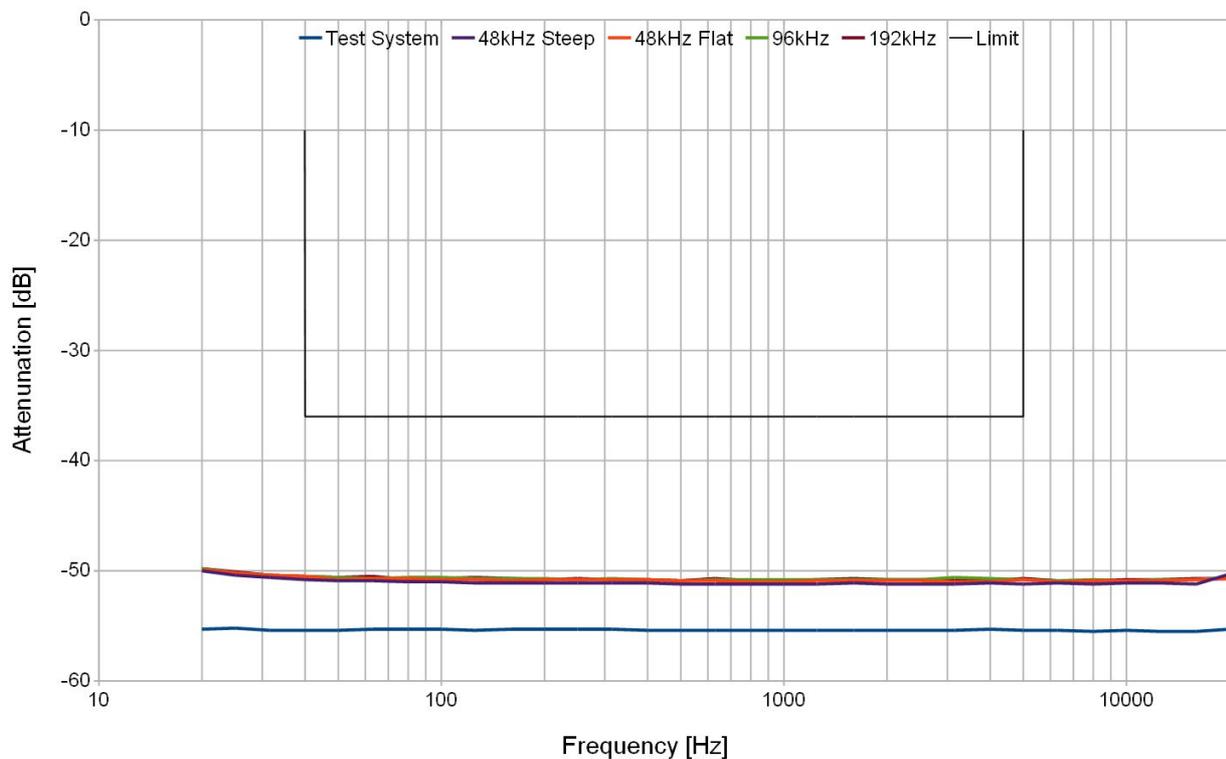


Fig. 67: Frequency-dependent THD+Noise at -60 dB (300 Ω Load)

New 4.0 YARDSTICK 2493 – Analog Electrical I/O Balance (»CMRR«)

All boundaries (shown in gray on the diagrams) are based on IRT Pflichtenheft 3/5 (Oct 1990).

Unbalance of Input Impedance

2493 - (c) Quantec 2011

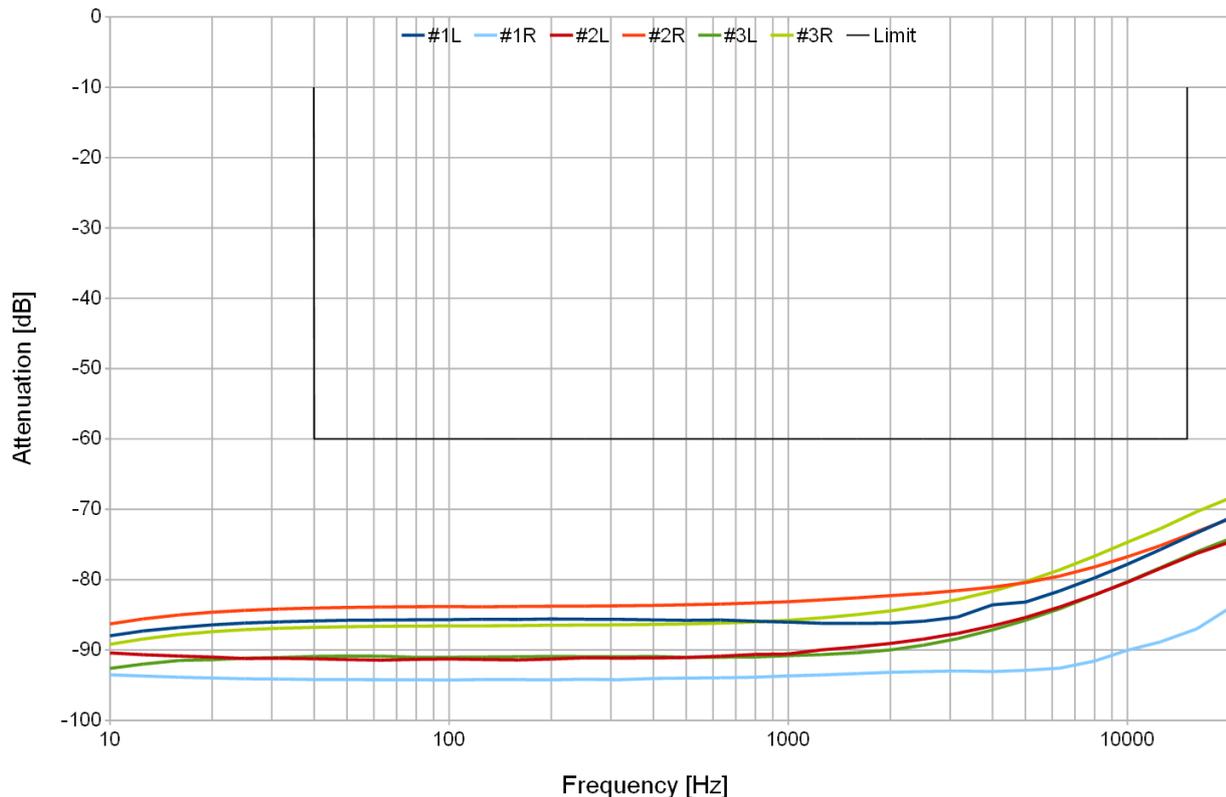


Fig. 68: Input driven by a pair of 100 Ω resistors (3 units tested)

For input CMRR measurements (Fig. 68), both the internal *differential-mode gain* (as set from the **Analog Input Level** menu item on p. 171), and the internal *common-mode gain* (1.0, regardless of input gain setting), need to be matched. Differential mode gain is *close to 1.0* with the *analog input level set to +8 dBu* on the menu. To simplify calculation, we recommend that all CMRR measurements should be done with a fixed +8 dBu analog input level setting.

Another key point to be taken into account is the *common-mode clip level*, which is at about $3.7 V_{pp} = 1.3 V_{rms} = +4.5 \text{ dBu}$.

To preserve some headroom, we recommend uncritical CM test voltages (unbalanced to ground) near 0 dBu or near $1 V_{rms}$.

Unbalance of Output Impedance

2493 - (c) Quantec 2011

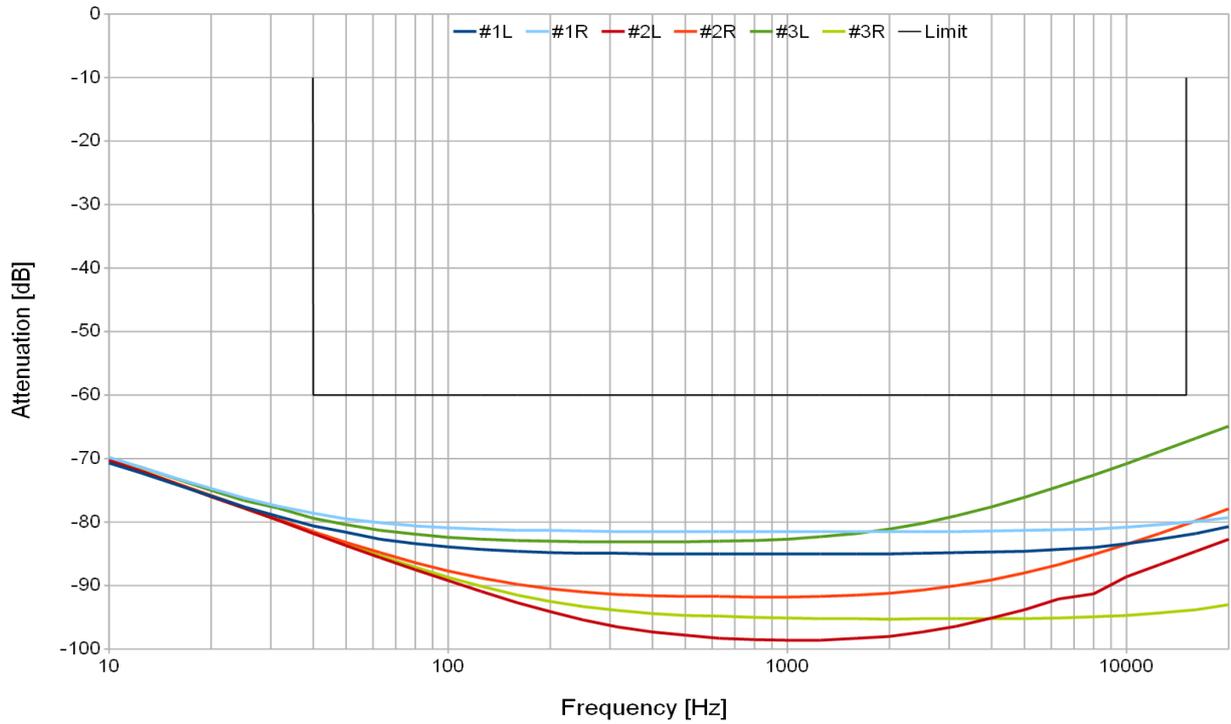


Fig. 69: Output back-driven from a pair of 150 Ω resistors (3 units tested)

Unbalance of Output EMF

2493 - (c) Quantec 2011

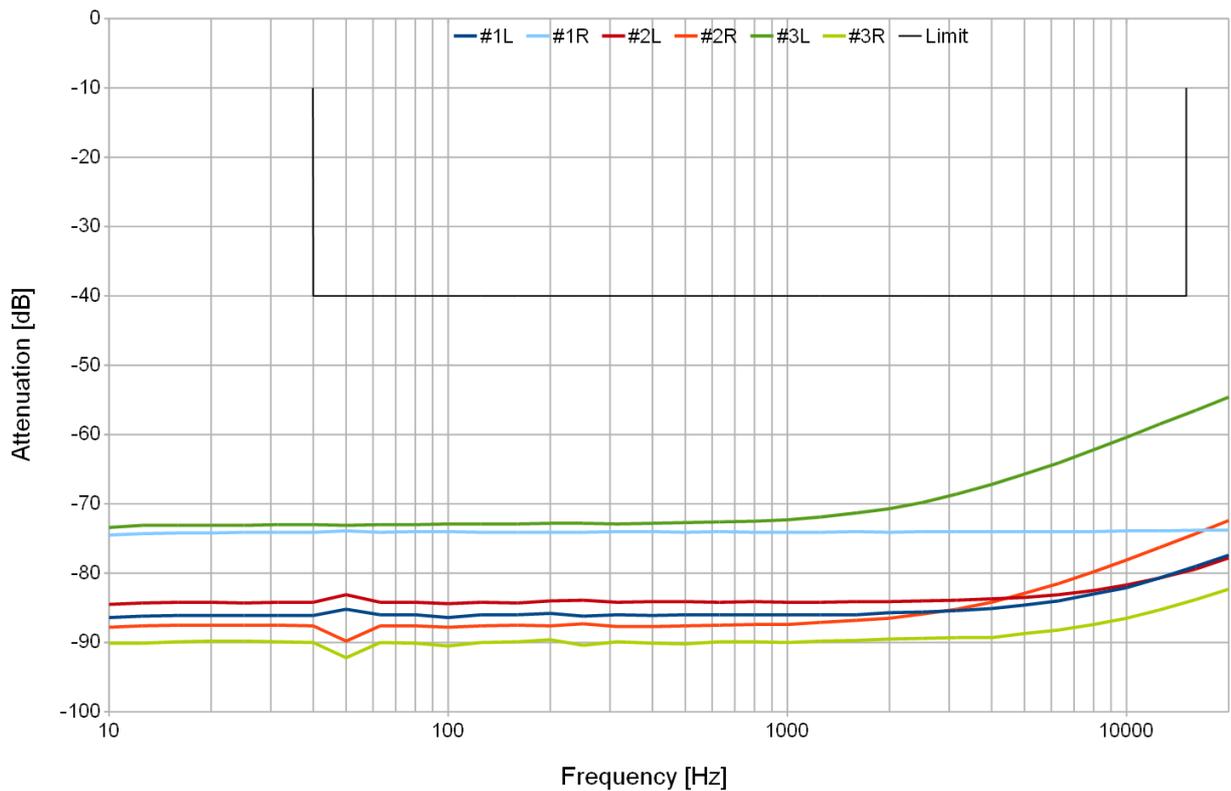


Fig. 70: Test load is a pair of 150 Ω resistors (3 units tested)

New 4.0 YARDSTICK 2493 – Antialiasing Filter

Unfortunately, there are no detailed specifications or limits for >5 kHz mentioned in IRT Pflichtenheft 3/5 (Oct 1990).

Aliasing Artifacts near $F_s/2$

(c) Quantec 2011

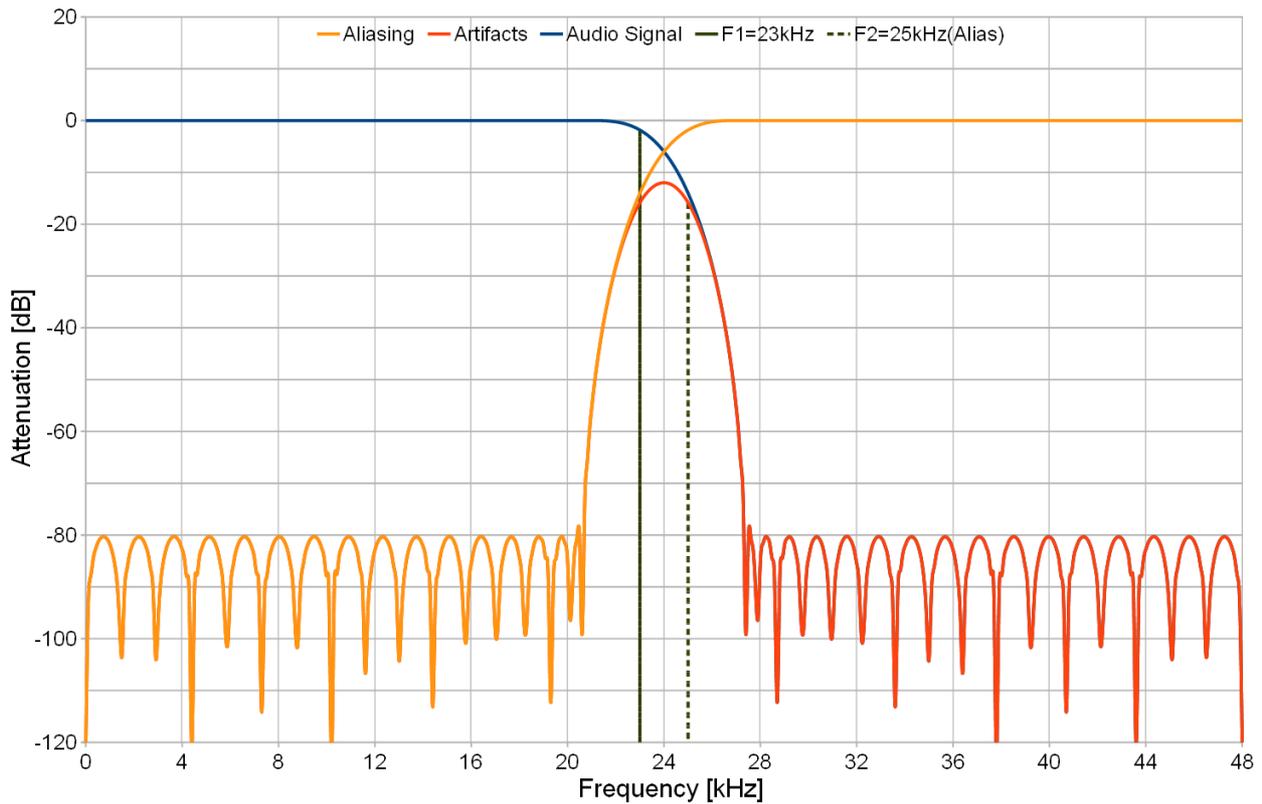


Fig. 71: Industry-standard aliasing artifacts (red chart) – 2493 »Flat« setting

It's of eminent importance that an A/D or D/A antialiasing filter's attenuation at half the sample rate is more than 30 dB each (Fig. 72), and not just the industry-standard of 6 dB each (Fig. 71). See [FAQ 058](#) for details.

Aliasing Artifacts near $F_s/2$

(c) Quantec 2011

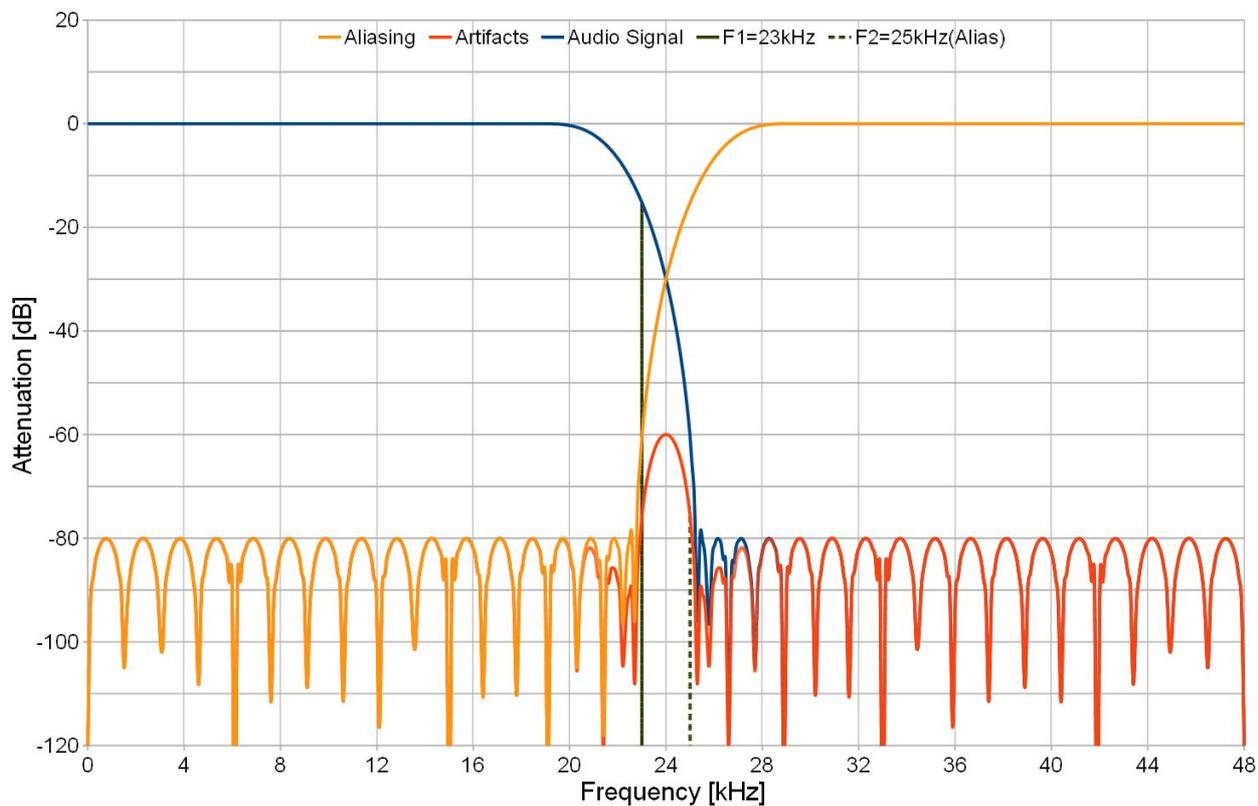


Fig. 72: QUANTEC in-house standard aliasing artifacts (red chart) – 2493 »Steep« setting

Remote Data Interfaces



Fig. 73: Remote data interfaces

- RS-232** Allows serial connection to a PC, for software updates or storing Presets. In addition, allows connection of a remote control and source its power.
- USB** Allows connection of a Hi-Speed USB link to a PC for loading and storing Presets. With LED activity indicator. This interface is not yet being used/addressed by the software.
- MIDI** Allows the use of MIDI signals for Preset and parameter changes. Connectors for **MIDI in**, **MIDI thru**, and **MIDI out** are provided.
- Ethernet** A 10Base-T Ethernet interface with green LINK LED and yellow ACT LED. Its MAC address is printed on the left side of the rear panel next to the mains connector. Ethernet permits the YARDSTICK to be connected to a network allowing retrieval of Presets from a central server, or for remote operation using a web browser, or a dedicated remote control unit.

Power Supply

The internal power supply is designed to operate at 115 V and 230 V mains voltage. The selection is done automatically by the unit. Connection to mains is made using an IEC power connector. Maximum power consumption of the 249x units extends from 12 VA to 20 VA. More details in [FAQ 063](#) and in our *249x Comparison List* at www.quantec.com?prod_comp.

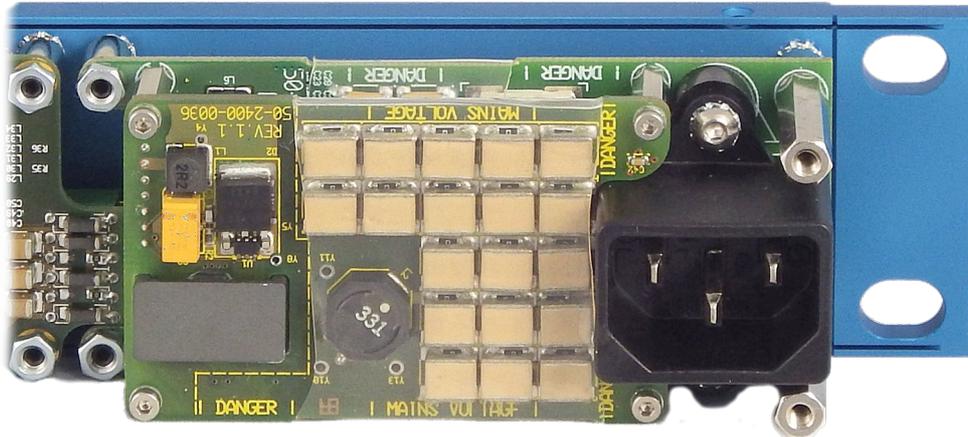


Fig. 74: Power supply with planar transformer (bottom left) and 19 of 50 filter capacitors (center)

Zerolytics Technology

As the majority of our 1982 QRS devices can attest: professional audio devices are being operated over 25 years and more. Meanwhile, it is common knowledge that electrolytics have a tendency to dry up after a couple of years. As a consequence, for professional devices in continuous operation, all electrolytic capacitors of a device should be preventatively replaced every 5-10 years (*»recapping«*). But today, the following applies: whether AD, DA, or power supply – when opening a YARDSTICK, those countless "electrolytic timebombs", otherwise ubiquitous within *any other audio device of any other make*, can absolutely not be discovered within that unit ...

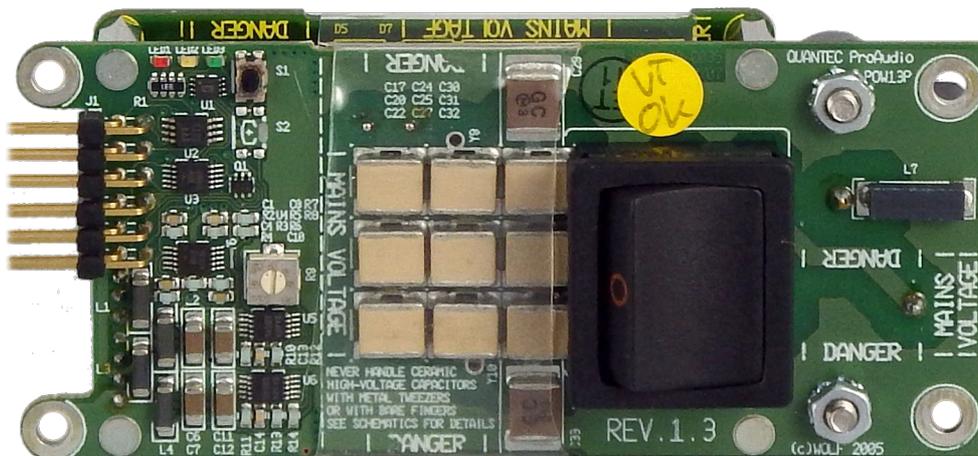


Fig. 75: Power supply dismantled – front view with 9 additional filter capacitors

Due to its excessive cost (more than \$120 for our power supply), Ceramic Capacitor Array technology has been established essentially in satellites and transatlantic cables. Having said that: as long as soldering is controlled well, and the PCBs are not mechanically stressed, ceramic capacitors show no aging at all. Their lifetime is said to keep up at least 100 years.

Remote Control via Web Browser

Starting from software version 3.0, all YARDSTICKs may be controlled from remote via Ethernet, and the web browser already installed on every PC/Mac. The two requirements are a browser that supports JavaScript version 1.5, and an integration of the YARDSTICK into the studio's Ethernet LAN infrastructure. For the simplest case, an Ethernet cross cable is all that's required. Amongst the web browsers standing out from the crowd due to their quick JavaScript responses are in early 2010 (with the introduction of our browser-based remote control) Apple Safari 4, Google Chrome 3, Mozilla Firefox 3.5, and Opera 10.

In the years thereafter, the speed of JavaScript engines of all browsers has improved, in some cases drastically (5-10 times). At press date of this guide (3/2014), the three most popular browsers Chrome, Firefox, and Internet Explorer are all well suited for the operation of the YARDSTICK. See more details about recommended browsers near the bottom of the remote control splash page, which will be described on p. 75.

Hypothetically speaking, it would be easy to control a device located on the other side of the globe. But, with more than LAN-typical ping delays, a slow initial loading of the screen, and a lagging input response may stretch performance beyond acceptability. This should not prevent a patient user to help his on-site colleague from home office or hotel, or to carry out non-critical jobs such as Preset administration, or installing of new software. Or, in the case of the author, taking screen shots for the Operations Guide from home office, while the YARDSTICK is at the company ...

Preparation

The device's Ethernet interface needs to be configured manually or via DHCP. More details are available in the **Configure Ethernet** chapter starting from p. 191. To protect the unit from being contacted by hostile browsers, and to prevent DOS attacks (*»Denial of Service«*) against the unit, it is expressly recommended to hide it behind a firewall.

The temporal distance between browser and unit directly influences operation latency of the device. Estimate reasonable latencies with a test ping from the browser PC to the unit. We recommend not to exceed ping times of a few milliseconds.

Note: For a YARDSTICK controlled mainly via remote control, activation of a suitable screen saver is recommended (see p. 146).

To control a YARDSTICK via web browser, no special knowledge is required. Any person with standard network knowledge does the Ethernet configuration on the fly.

Establishing Connection

One way of establishing connection requires entering the IP number into the browser's address field. If the IP numbers are dispatched by a DHCP server, one can verify the IP number, assigned to the YARDSTICK at turn-on, from the **Show Ethernet** menu item described on p. 190. Please configure your DHCP server to always allocate the same IP number whenever a certain MAC address tries to connect again later.

Customers with access to a DNS server may assign a plain text name to this IP number. This allows for entering a meaningful name into the browser's address field, instead of a number. After confirming the entry, the browser establishes connection with the YARDSTICK, and the following splash screen will be displayed:



Fig. 76: Splash screen

Use the **Parameters Panel** link for operating a YARDSTICK from the web browser.

Alternative plug-ins may be launched from the **Select Plug-in** drop-down menu (Fig. 77). For a newly-installed plug-in, its bank number will have an 'N' attached (Fig. 77, near **Bank 4**), which will disappear after booting-up for the first time. To replace a plug-in, simply select the desired bank. After a confirmation, the unit starts rebooting. While waiting, there will be a countdown in the browser window, which, when reaching '0', will try to establish connection with the new plug-in. If that fails, the reason might be that a different IP number has been allocated to the YARDSTICK by your DHCP server.

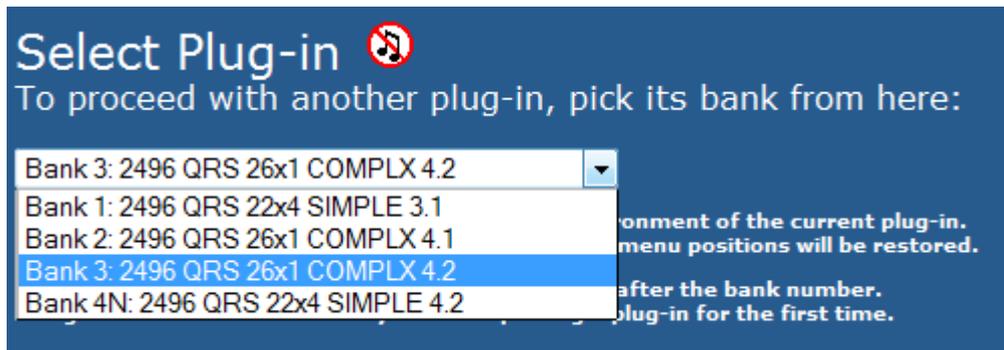


Fig. 77: Select Plug-in

Use the **Preset/Setup Archive** link (Fig. 76) to archive Presets from the YARDSTICK's *Local* or *Bank* archives via web browser to PC or Mac files. Putting them back into the unit is possible, too, but to the *Local* archive only. Similarly, you can archive *Device setup* and *Plug-in setup* via the browser on a PC or Mac, or putting them back.

Use the **Software Management** link (Fig. 76) to update existing, to install additional, or to delete obsolete plug-ins.

All links open new windows – if necessary, you need to enable that in your browser.

Parameters Panel

A new browser window will be opened (Fig. 78), which represents a summary of all parameters available from the plug-in of the currently attached YARDSTICK unit. The graphical layout, consists of three panes, and is identical for all QRS plug-ins. For various units, certain elements are grayed out and inactive, whenever not available due to hardware restrictions.

Whenever all black readouts are empty or inactive, communication with the YARDSTICK has been suspended. As soon as communication will be re-established, those readouts will fill up again.

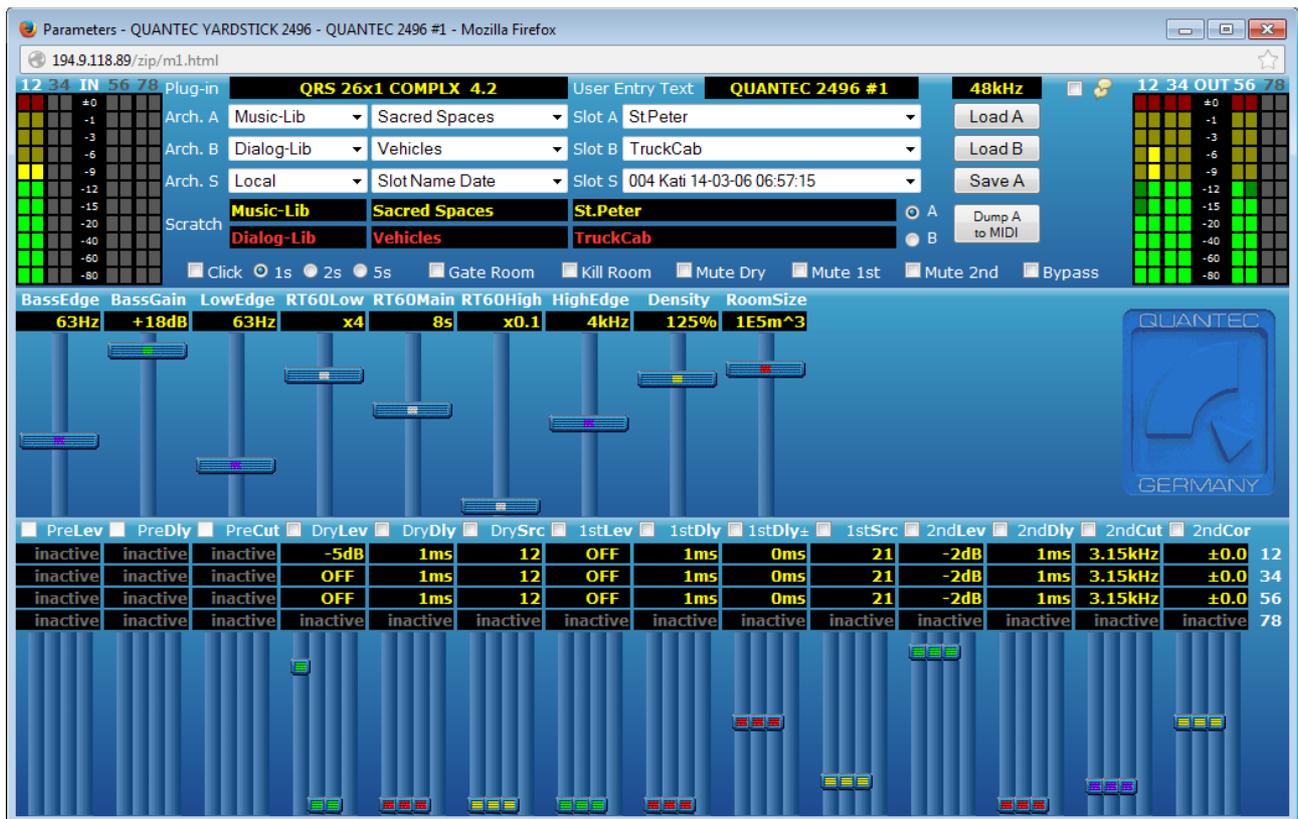


Fig. 78: Parameters Panel

Status, Hotkeys, and Presets

The topmost window pane (Fig. 79) covers all status information, Hotkeys, and administration of the Presets.

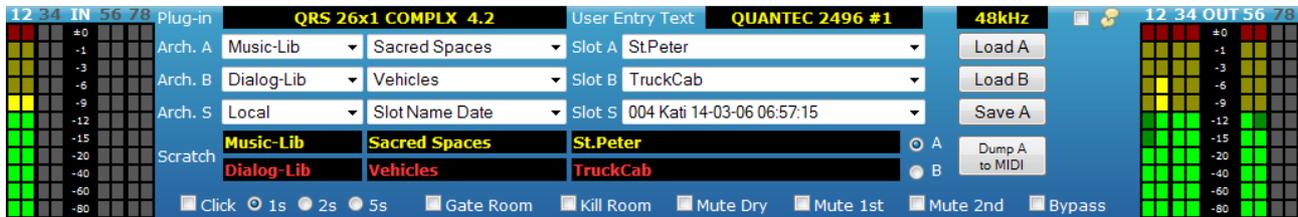


Fig. 79: Parameters Panel – topmost panel

All input bargraphs are on the left; all output bargraphs on the right. If any inputs or outputs are not available, they are grayed out.

The topmost row displays status information about the active plug-in, the text string from the **User Entry** field (see p. 153), and the current sample rate. Near the speech bubble icon, very helpful tooltips for newcomers can be activated. Normally, these tooltips are volatile, that is, they disappear immediately with removal of the mouse pointer. If you want to use the links mentioned in the tooltips, or copy text, click on the desired object. Now you can move the mouse pointer inside the tooltip balloon, in order, e.g. to click one of the links. The plug-in identifier consists of its name and version number. The *User Entry* string acts as an identification, and should be individually assigned to each unit. This ID helps to select an individual unit from a bunch of similar ones.

The sample rate will be displayed in various colors:

yellow	Everything ok.
yellow blinking	The frequency bits in the Channel Status Data do not match with the frequency measured.
red blinking	No input signal, or the sample rate is outside the valid range for device or plug-in.

From rows 2 and 3, the Preset sources for Scratch A and B may be preselected with drop-down menus, then transferred to the appropriate Scratch buffers by hitting the **Load A** and **Load B** buttons. If the associated Scratch is currently active, the Preset becomes immediately audible, otherwise it will be loaded silently in the background. Starting from version 3.1, an additional source **File** has been added. If selected, clicking the button opens a new window to upload the Preset using the browser. See more about this feature in the **Preset Load** (p. 82) section.

From row 4, a target position may be preselected for depositing the contents of Scratch A to an archive. Hitting the **Save A** button queries for a Preset name, then triggers the final transfer. Again from version 3.1, an additional destination **File** has been added. If selected, clicking the button opens a new window for saving the Preset with the browser. See more about this feature in the **Preset Save** (p. 83) section.

From rows 5 and 6, either Scratch A or Scratch B may be selected for monitoring. These two rows also visualize the original source paths of the two Scratch Presets. The **Dump A to MIDI**

button triggers a MIDI port burst transmission of Scratch A. See more details in the **Scratch Dump to MIDI** section (p. 107).

Row 7 represents a collection of Hotkeys. Their function is discussed in detail in the **Hotkey Menu** (p. 97).

Note: The contents of any browser drop-down list represents a snapshot of YARDSTICK internals. Whenever *Local* slots are written or erased, drop-down lists need to be rebuilt. Rebuilding a drop-down list may undo a current manual preselection.

Hands on – undo changes

When fiddling around, experimentally or unintentionally, hitting the Load A button as required seems to be a convenient trick for restoring skewed parameters back to their original library preset values (Load A, play around, Load A, try, Load A, try again ... until it fits expectations).

Room Parameters

The center window pane covers all room parameters.

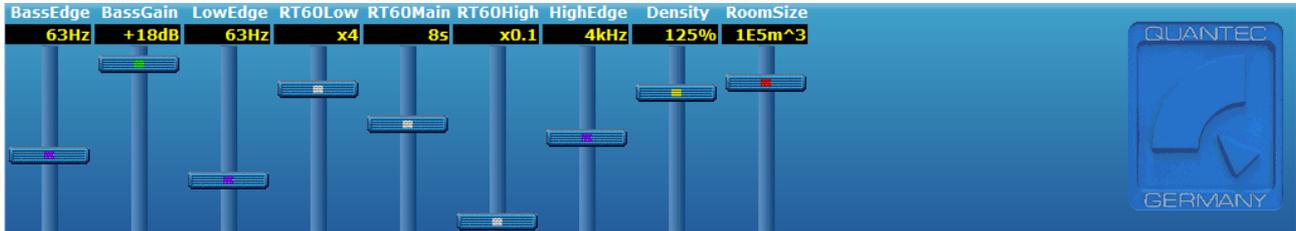


Fig. 80: Parameters Panel – room parameters

The topmost row (white) displays parameter *names*; while the second row (yellow) displays parameter *values*.

Below the text fields are sliders, which can be moved by mouse actions. One can change a value either by clicking and dragging the slider button, or, while the mouse cursor has been positioned anywhere on the slider track, by rotating the mouse wheel. With an iPad, the usual touch gestures are supported instead.

When modified, a parameter value will instantly be transmitted to the unit, and while underway, will be displayed grayed out. As soon as the confirmation from the unit drops in, the display turns yellow again. For short Ping times, the gray interval may hardly be noticed at all.

Note: On the Mac user interface, the mouse wheel operates reversed (contrary to a PC, a Mac moves a slider similar to an aircraft: drag for lifting up). If a PC user (who's accustomed to something like "moving mouse on screen") perceives this as counter-intuitive, the direction can be easily reversed within the operating system.

Input and Output channels

The bottom window pane incorporates all parameters that are assigned to any of the unit's input or output channels.

<input type="checkbox"/> PreLev	<input type="checkbox"/> PreDly	<input type="checkbox"/> PreCut	<input type="checkbox"/> DryLev	<input type="checkbox"/> DryDly	<input type="checkbox"/> DrySrc	<input type="checkbox"/> 1stLev	<input type="checkbox"/> 1stDly	<input type="checkbox"/> 1stDly±	<input type="checkbox"/> 1stSrc	<input type="checkbox"/> 2ndLev	<input type="checkbox"/> 2ndDly	<input type="checkbox"/> 2ndCut	<input type="checkbox"/> 2ndCor	
inactive	inactive	inactive	-5dB	1ms	12	OFF	1ms	0ms	21	-2dB	1ms	3.15kHz	±0.0	12
inactive	inactive	inactive	OFF	1ms	12	OFF	1ms	0ms	21	-2dB	1ms	3.15kHz	±0.0	34
inactive	inactive	inactive	OFF	1ms	12	OFF	1ms	0ms	21	-2dB	1ms	3.15kHz	±0.0	56
inactive	inactive	inactive	inactive	inactive	inactive	78								

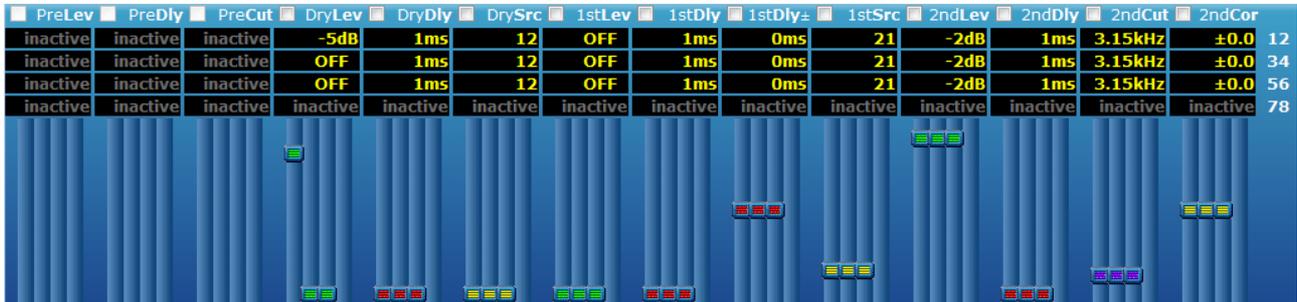


Fig. 81: Parameters Panel – input and output channels

The topmost row (white) displays parameter *names*; while rows 2 to 5 (yellow) display the parameter *values* of the various input and output channel pairs.

Below the text fields are sliders, which can be moved by mouse actions. One can change a value either by clicking and dragging the slider button, or, while the mouse cursor has been positioned anywhere on the slider track, by rotating the mouse wheel. With an iPad, the usual touch gestures are supported instead.

With the top row tick boxes, one may establish links between more than two channels. Whenever a tick box has been activated, all parameters under that name will be modified simultaneously. After a newly dropped tick, all sliders jump into lockstep immediately after the first modification; and will stay in lockstep up to a later deactivation.

Any parameters not available on this unit or plug-in are being displayed without slider knob, and with a gray **inactive** in the parameter value field(s).

Note: On the Mac user interface, the mouse wheel operates reversed (contrary to a PC, a Mac moves a slider similar to an aircraft: drag for lifting up). If a PC user (who's accustomed to something like "moving mouse on screen") perceives this as counter-intuitive, the direction can be easily reversed within the operating system.

Preset Load

Whenever a source **File** has been selected in the Parameters panel, clicking the **Load A** or **Load B** button will open a new window.

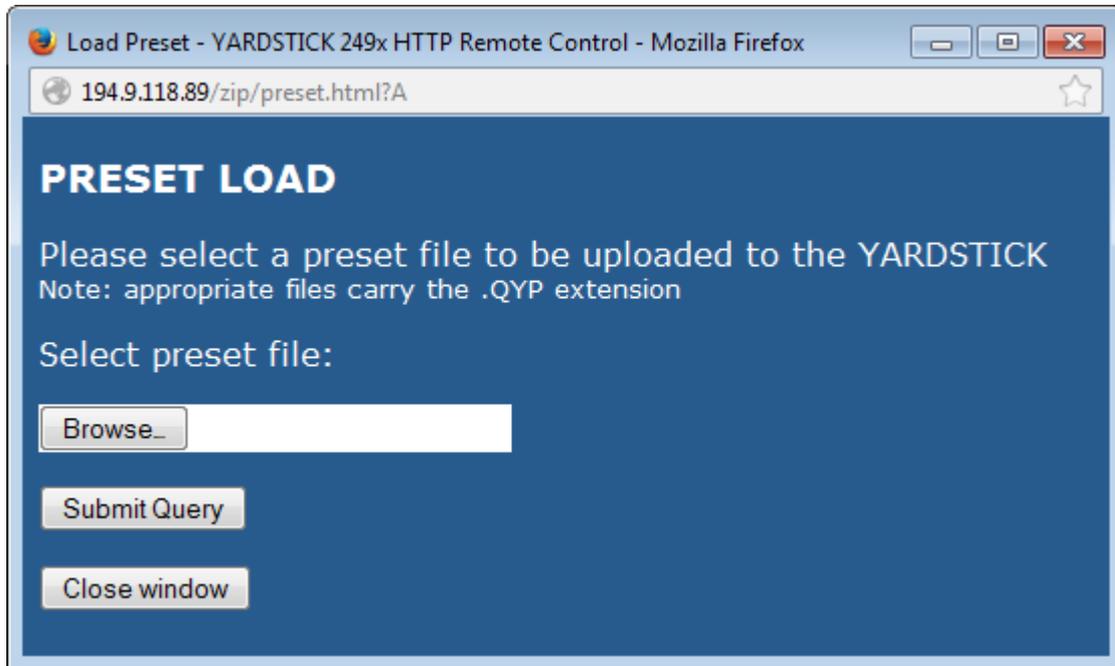


Fig. 82: Preset Load

This window allows to select the file that contains the desired Preset. Generally, a file name consists of date and time of its most recent modification, followed by the Preset name. Preset files always carry the .QYP extension. By hitting the **Submit Query** button, the file will be uploaded and written to the corresponding *Scratch* register.

Note: Within the context of Factory Presets, indicating date or time is meaningless. Such a *calendaric zero date* is usually represented by *700101000000*. Any Preset file, which name starts with that number, therefore contains a Factory Preset not yet modified by the user.

Preset Save

From the Parameters panel, clicking the **Save A** button opens a dialog window to enter the name of the Preset.

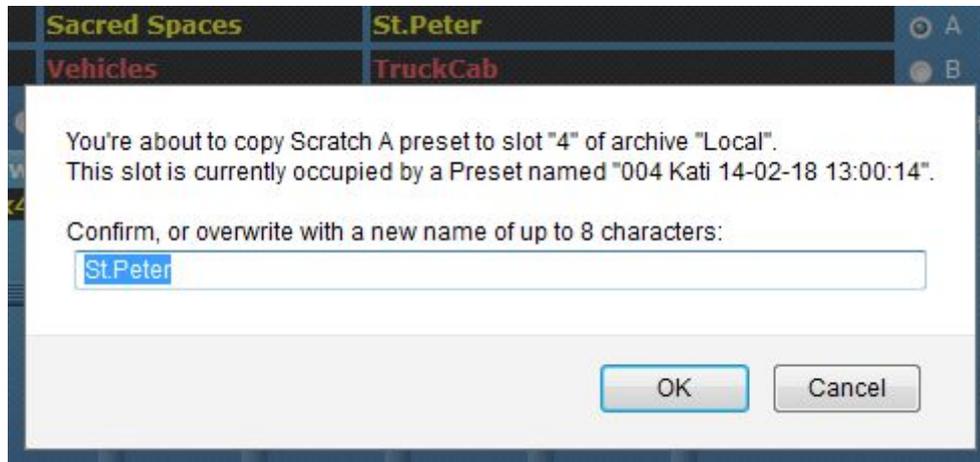


Fig. 83: Preset Save – Preset Name

Initial suggestion is the *Scratch A* name (line 5 of *Parameter panel*). The name may be no longer than 8 characters, and must not contain any special characters.

For both the **Local** or **Scratch B** targets, when clicking **OK**, the Preset will immediately be copied to the selected slot, or to the *Scratch B* register. For a **File** target, clicking **OK** opens a new dialog window to enter the required file name.

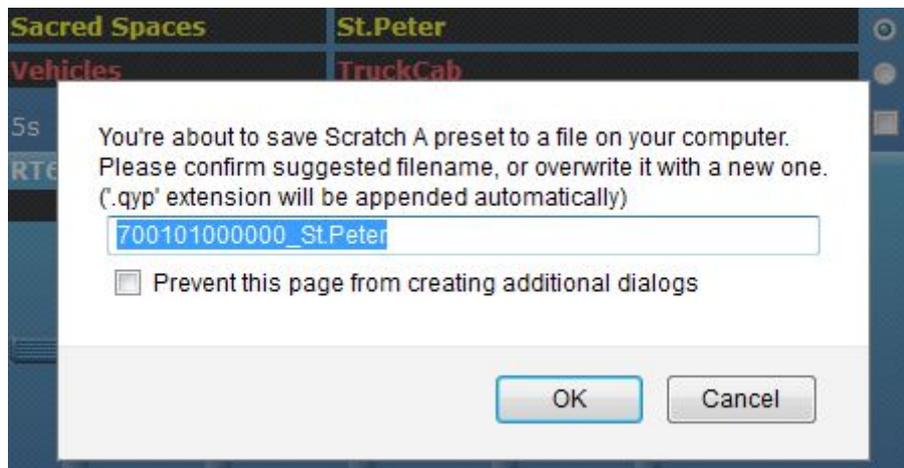


Fig. 84: Preset Save – File Name

The suggested file name consists of date and time of its most recent modification, followed by the Preset name.

Note: Within the context of Factory Presets, indicating date or time is meaningless. Such a *calendaric zero date* is usually represented by 700101000000. Any Preset file, which name starts with that number, therefore contains a Factory Preset not yet modified by the user.

Preset/Setup Archive

From this browser window, a plug-in's Presets, plug-in's Setup, and Device Setup may be archived on a PC or Mac, and likewise installed from there back to the YARDSTICK again.

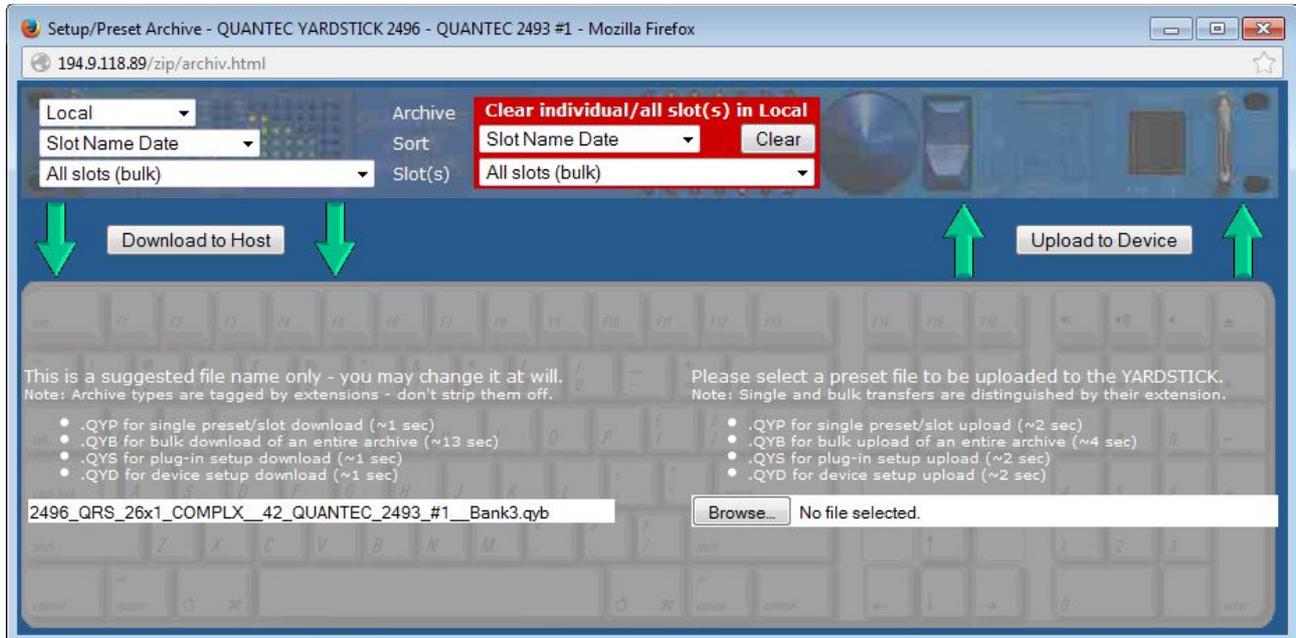


Fig. 85: Preset/Setup Archive

The upper pane of this window emblemizes the YARDSTICK, the lower pane a PC or Mac. On the left are all the download transfers from device to PC/Mac (*»Download«*), on the right all upload transfers back to the YARDSTICK (*»Upload«*). Whom the view appears a bit unconventional, remember that the YARDSTICK represents a web server accessible in the Internet – more about that in [FAQ 052](#). The red area is used to clear slots.

The topmost left drop-down menu group allows to define a source within the device. In the first line, you can select an archive (*»Local«* or *»Bank«*). The *»Bank«* archive is available only if it has been registered with the **Bank Archive** menu item (p. 133). With the next line, one selects the sort order of the slots for the third line. In addition to individual slots, one can select **All slots (bulk)**, **Device Setup**, or **Plug-in Setup**.

Within the bottom left field, an appropriate file name is being suggested, which can be altered arbitrarily. File names for Presets consist of date and time of its most recent modification, followed by the Preset name. File names for entire archives are composed of device type, plug-in name, user entry field, and Bank number. According to browser type and configuration, this may already be your final chance to change the target file name. CAUTION! - Never change the file *extension* (QYP for Presets, QYB for archives, QYS for Plug-in setup and QYD for Device setup), as you would inhibit future write-backs.

Clicking **Download to Host** initializes the file transfer. The screen text states transfer times for ideal conditions (short ping times). According to browser type and configuration, the user may decide which place a file will be transferred to. Otherwise, the file will be dropped into the predefined *download* browser folder.

The top center area *highlighted in red* is for bulk or single-slot erasure. When clicking *Clear*, a confirmation box pops up.

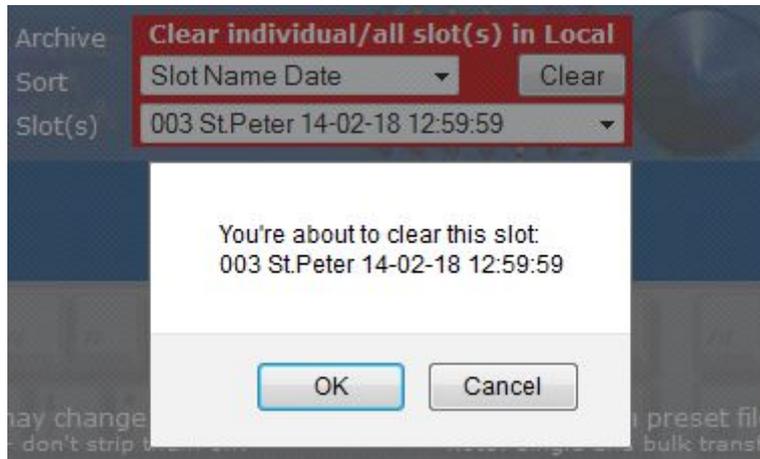


Fig. 86: Clear Slot

A bulk erasure will take some time, while the buttons are inactive until finished. By the way, there is *no need* to clear a slot before uploading a new Preset

From the lower right, a file for uploading to the device may be selected. The file extension alone determines if a *single slot* (QYP), the *entire Local archive* (QYB), or a *setup* (QYS/QYD) will be installed.

Clicking **Upload to Device** initializes the file transfer. The screen text states transfer times for ideal conditions (short ping times).

Note: The contents of any browser drop-down list represents a snapshot of YARDSTICK internals. Whenever *Local* slots are written or erased, drop-down lists need to be rebuilt. Rebuilding a drop-down list may undo its current manual preselection.

Note: Within the context of Factory Presets, indicating date or time is meaningless. Such a *calendaric zero date* is usually represented by *700101000000*. Any Preset file, which name starts with that number, therefore contains a Factory Preset not yet modified by the user.

Before overwriting a *Local* archive with a QYB file, the following confirmation screen appears:

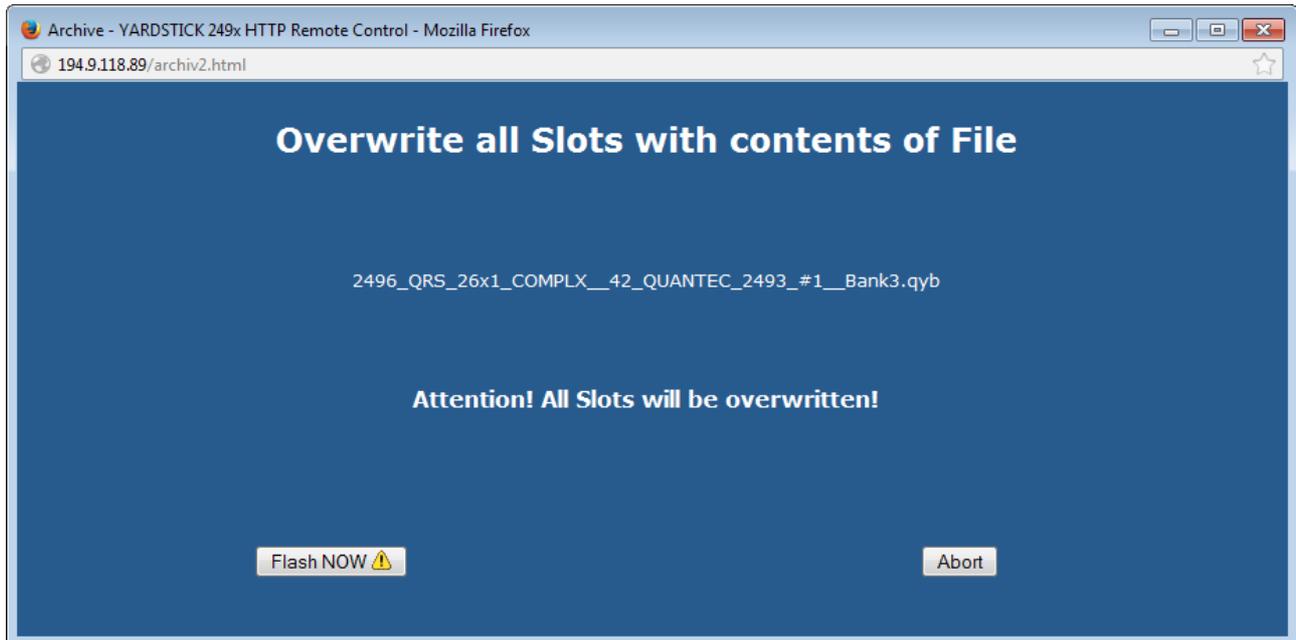


Fig. 87: Confirmation screen Bulk Preset file – QYB

By clicking **Flash NOW!**, the entire *Local* archive will be erased and overwritten with the contents of the file. This may take several seconds. When finished, the program will return to the *Archive window* startup page. Clicking **Abort** will immediately take you back to the *Archive window* startup page; without any modification.

Note: ⚠ indicates that the action will be performed without further confirmation prompt!

With each transfer of a QYP file, only *one* Preset will be written. This requires you to select one of the 250 target slots available in QRS-type plug-ins. To facilitate your selection, various target slots are being suggested.

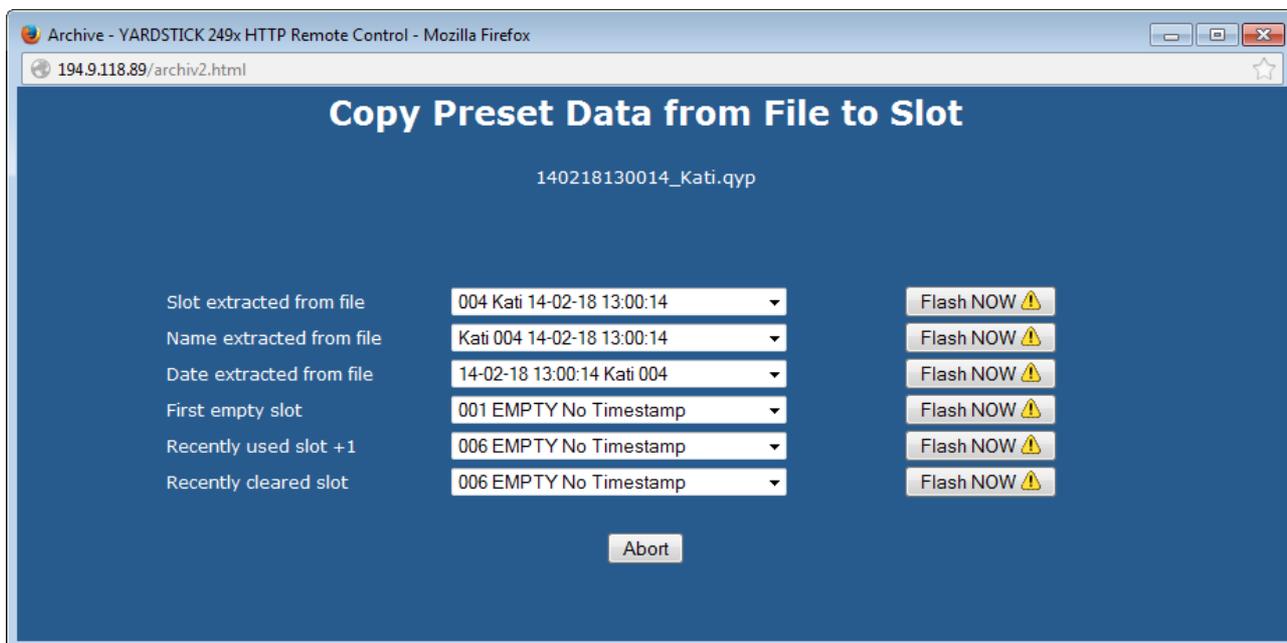


Fig. 88: Select target slot for Preset file QYP

The top 3 suggestions are inferred from information within the QYP file itself: Slot number, Preset name, and Preset date. Sorting this information according to number, name, and date results in the 3 topmost drop-down menus.

Line 4 simply offers the *next free* slot number. Line 5 is useful for transferring *multiple Presets* in rapid succession, as it facilitates placing them into consecutive slots. Line 6 reoffers the slot that has been cleared lately.

It's quite common that some of the suggestions remain unspecified. This may happen whenever contradicting indicators are found, or if no slot has been cleared within an ongoing session yet.

By hitting the appropriate **Flash NOW!** button, the Preset will be moved to the slot shown on the corresponding drop-down menu. Then the program will return to the *Archive window* startup page. Clicking **Abort** will immediately take you back to the *Archive window* startup page; without any modification to the *Local* archive.

Note: ⚠ indicates that the action will be performed without further confirmation prompt!

Before overwriting a *Device setup* with a QYD file, the following confirmation screen appears:



Fig. 89: Confirmation Device Setup file QYD

By clicking **Flash NOW!**, the entire *Device setup* will be erased and overwritten with the contents of the file. When finished, the program will return to the *Archive window* startup page. Clicking **Abort** will immediately take you back to the *Archive window* startup page; without any modification.

Note: ⚠ indicates that the action will be performed without further confirmation prompt!

When transferring a Plug-in setup with a QYS file, one can select whether the settings for menu group *Effect*, menu groups *Preset and MIDI*, or all three should be overwritten with the contents of the file:



Fig. 90: Confirmation Plug-in Setup file QYS

By clicking **Flash NOW!**, the selected parts of the *Plug-in setup* will be erased and overwritten with the contents of the file. When finished, the program returns the *Archive window* startup page. Clicking **Abort** will immediately take you back to the *Archive window* startup page; without any modification.

Note: ⚠ indicates that the action will be performed without further confirmation prompt!

Software Management

A browser window will be opened, which allows to install a new plug-in into a bank, or to delete a plug-in from a bank. This installing method differs fundamentally from the previous approach of temporarily attaching a unit to a PC with an RS-232 serial port. First, a serial port is no longer needed on the PC, second, the update software is now independent of the PC operating system, and third, the installation process is much, much faster now.

As the installation will be controlled from a currently running plug-in, there is no way of directly overwriting this active plug-in. Any other bank on the unit may be accessed for installing or deleting. If a need arises to erase or overwrite this currently active plug-in, just boot another one and do the job from there.

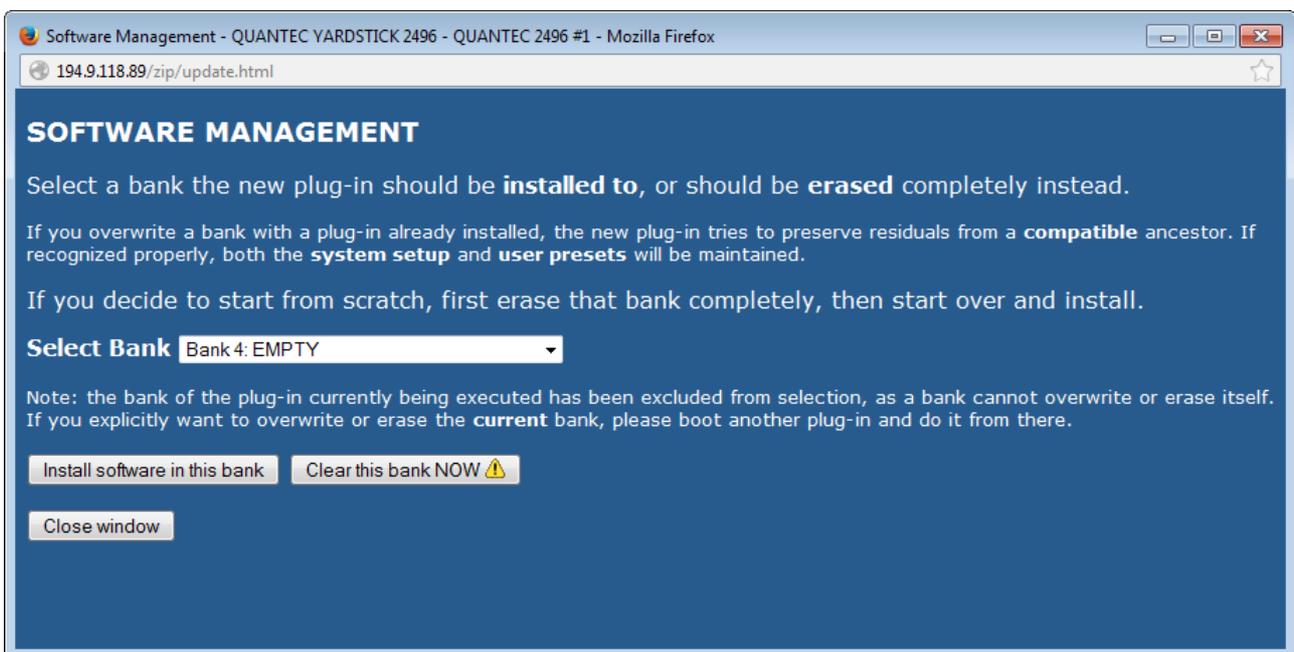


Fig. 91: Software Management - Select Bank

From **Select Bank**, a target bank may be selected from a drop-down menu. To facilitate navigation, the bank numbers are complemented by names and version numbers of all the plug-ins already installed. When opening this browser window, the topmost unused bank will be preassigned. If there is no empty bank left, the 1st or 2nd bank will be preassigned – depending on the currently active bank; which means the bank *not currently blocked* by the actively running plug-in.

An empty bank will be assigned **EMPTY**. This does not necessarily mean that this bank is totally blank, i.e. that there is no residual data at all. **EMPTY** just means that in this bank, no valid installation is being recognized. There may well be residuals from an aborted installation, or Preset residuals from an abandoned plug-in.

The active bank is the one the currently running plug-in has been booted from. It will be displayed gray in the drop-down menu, which means it cannot be selected for overwriting.

Note: ⚠ indicates that the action will be performed without further confirmation prompt!

By hitting the **Clear this bank NOW!** button, a new window will pop up, and the selected bank will be erased without further inquiry! Get more information from the **Clear Bank** section on p. 94.

By hitting the **Install software in this bank** button, a form will pop up to either enable entering a file name, or select any one from the files available.

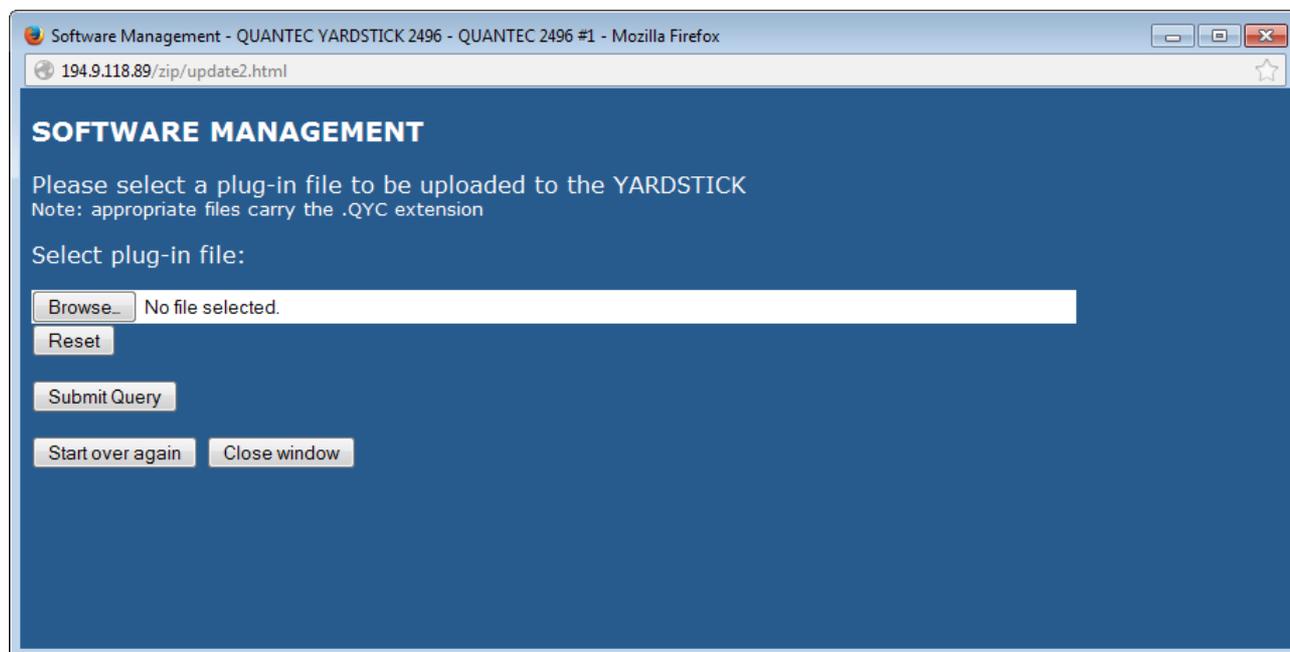


Fig. 92: Software Management - Select Plug-in File

By hitting the **Browse** and **Reset** buttons, one may select a file for installation, or cancel the selection. The procedure may differ slightly according to browser type or operating system. The file to be selected requires a .QYC extension. Files for the various plug-ins may be downloaded from www.quantec.com?plugins.

CAUTION! Renaming files may lead to problems while installing them!

Hitting **Submit Query** confirms a selection, and starts the upload of the file to the unit. Note that this is just the upload, not the final installation. From a LAN, an upload should not take more than a few seconds. Around the globe, one may expect a minute or two. For now, the file is buffered within the device, but not yet installed!

Note: According to the languages of operating system and web browser, the labeling of the buttons may differ considerably. If in doubt, try to get a clue from the *position* in the screenshots of the button in question.

Before the plug-in will be ultimately installed, there is a final prompt for confirmation.

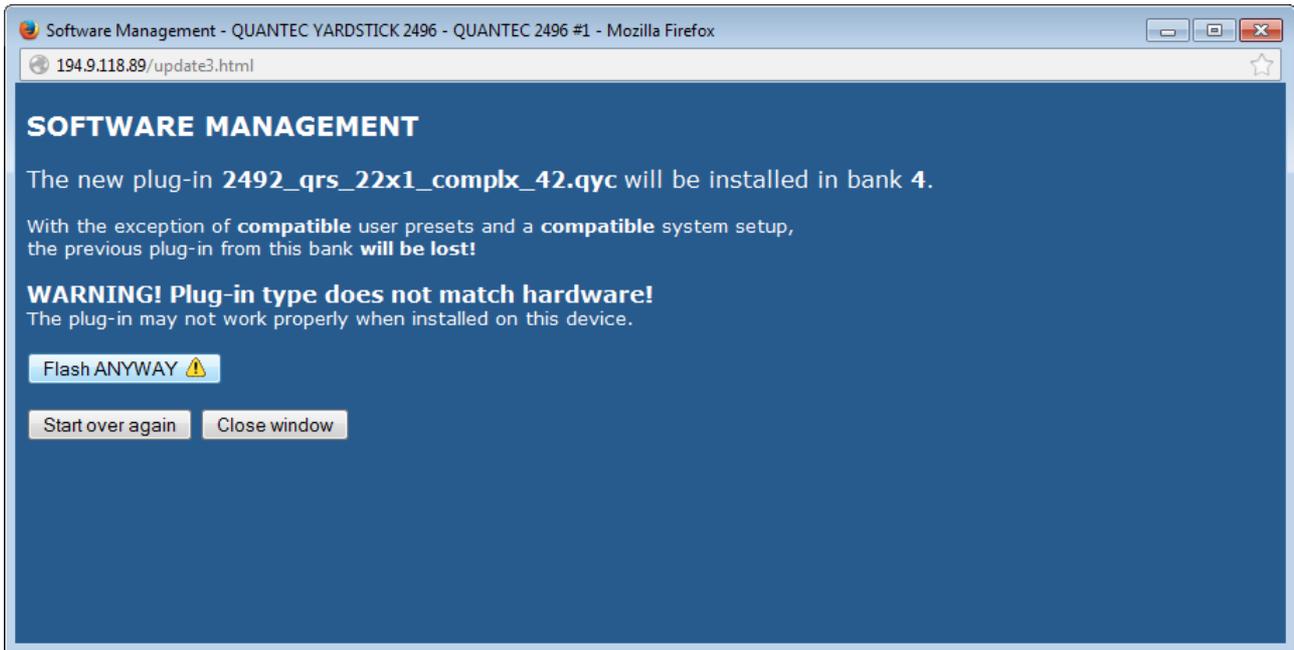


Fig. 93: Software Management - Confirmation

If a consistent plug-in cannot be located within the target bank, e.g. because it has been explicitly erased before, the top warning will be suppressed.

All information about the unit and the plug-in will be checked for plausibility. If both match, the bottom warning will be suppressed.

Note: ⚠ indicates that the action will be performed without further confirmation prompt!

By hitting the **Flash NOW!** or **Flash ANYWAY!** button respectively, the installation of the plug-in will finally be launched. A green bar indicates progress.

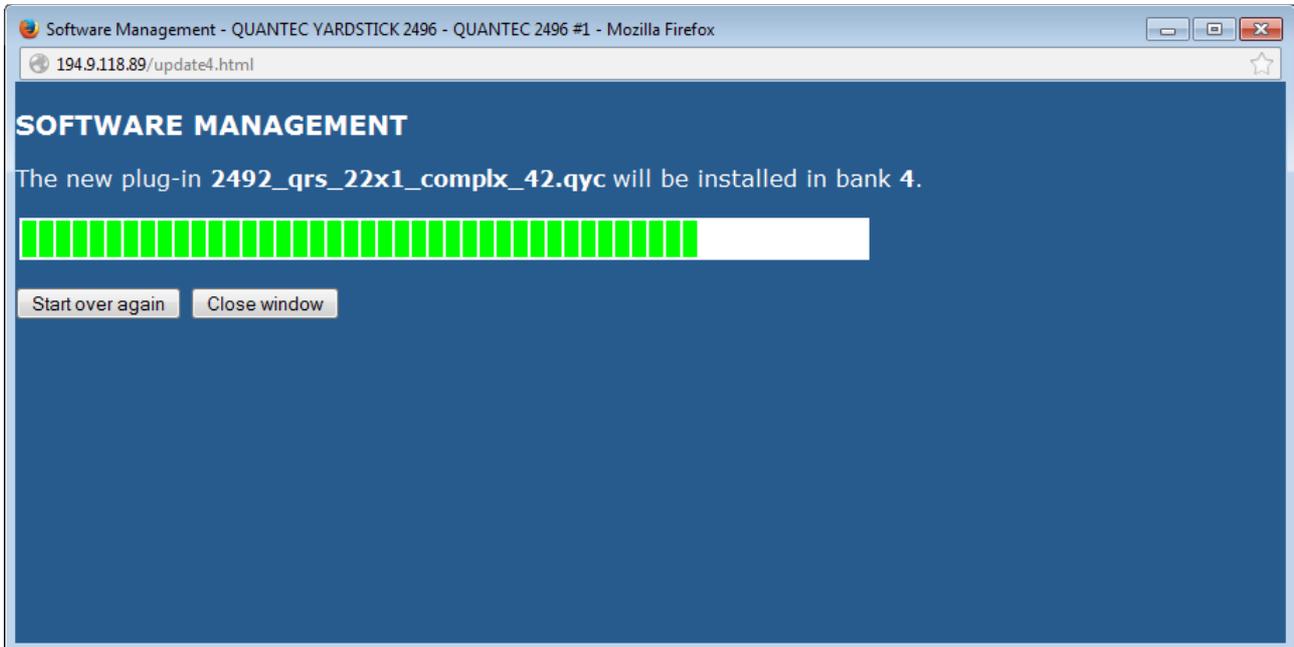


Fig. 94: Software Management – Installation process

A successful installation will be confirmed with the following page:

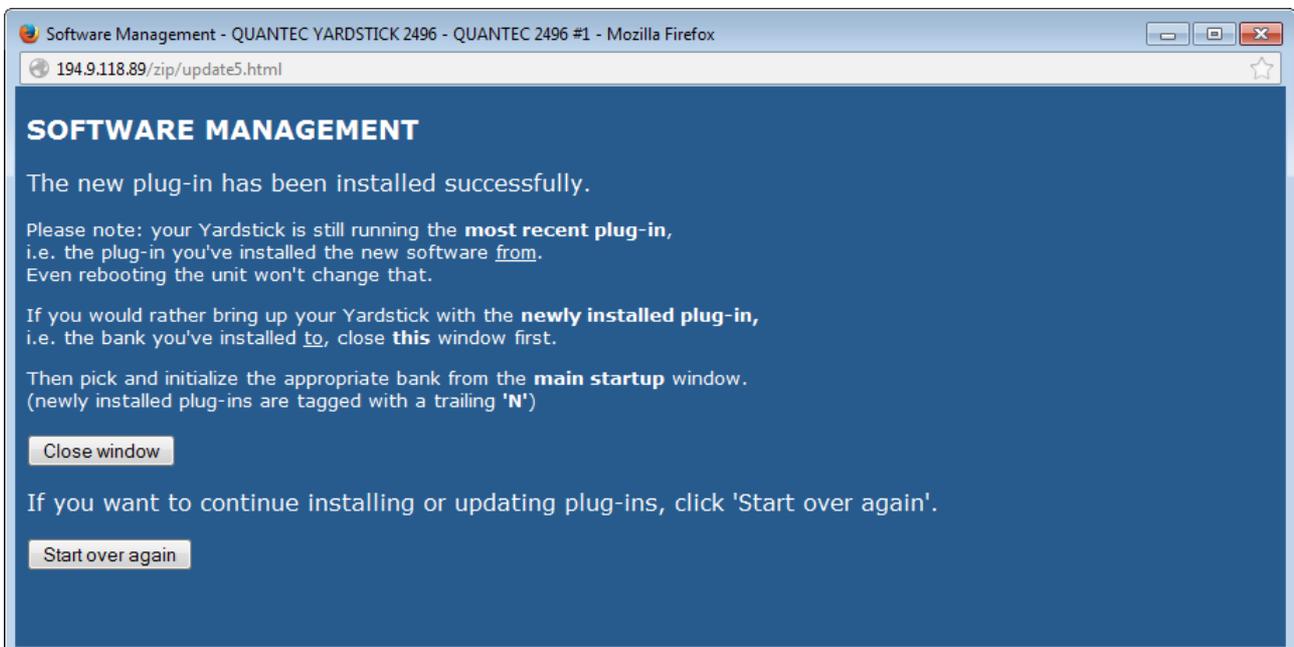


Fig. 95: Software Management - Completed

Whenever required, hitting **Start over again** would initialize an new sequence, which permits installing another plug-in to any of the banks. Otherwise, the installation procedure may be terminated by hitting **Close window**

Clear Bank

From within the **Software Update** browser window, hitting the **Clear this bank NOW!** button initializes a complete erasure of the entire contents of a bank. Sometimes it makes sense to deliberately *strip off any debris*, in order to prevent an *accidentally compatible plug-in* to include or revive Presets or other residuals from long-forgotten installations.

A new window will pop up:

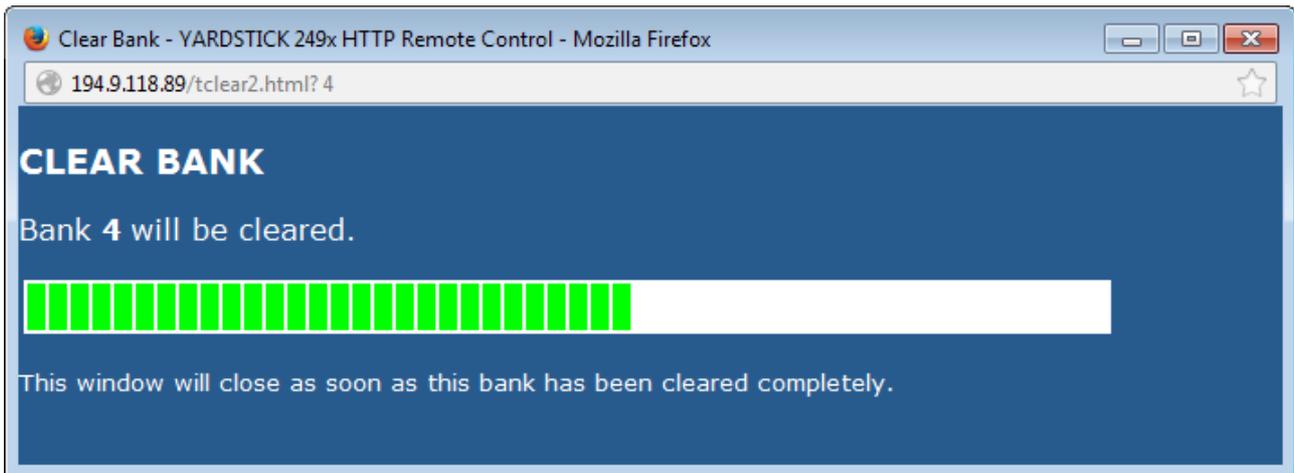


Fig. 96: Clear Bank

A green bar indicates progress of erasure. When finished, the window will close automatically.

Menu structure

Menus are grouped into main menus, with each having associated submenu items. In addition, there is a **Hotkey Menu**. All main menu items are shown below:

2492, 2496, and 2498:



Fig. 97: 2492, 2496, and 2498 main menu items

2493:

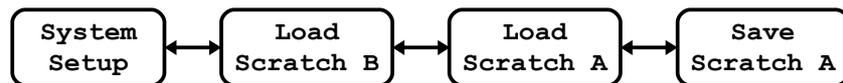


Fig. 98: 2493 main menu items

All main menu items are displayed similarly. The first line shows the plug-in name, followed by **Main Menu**, an icon for an ear, and the selected Scratch Preset (A or B). The *stylized ear* with the A or B character indicates which Scratch is being audible at the moment. The second line displays the name of the main menu item selected.

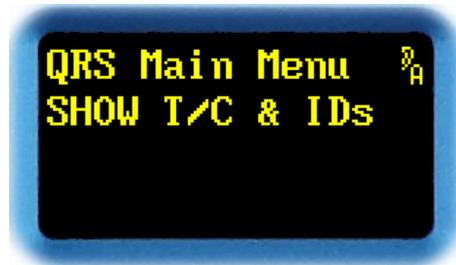


Fig. 99

Wheel →	Next main menu item
Wheel ←	Previous main menu item (dead stop)
Exit	Not assigned
Enter	Selects main menu item Show T/C & IDs
Toggle	Jump to Hotkey Menu

Rotating ← and → pages through the main menus.

ENTER confirms the selection.

TOGGLE jumps to **Hotkey Menu**, unless a local function is defined to intervene here.

Hotkey Menu

The **Hotkey Menu** is an additional menu sequence that can be accessed from almost all menus and menu items using the **TOGGLE** keys – unless **TOGGLE** is assigned to a specific local function. The **Hotkey Menu** forms a group of frequently used functions, and also serves as dedicated input for units lacking the Overview display keys.



Fig. 100: Hotkey menu

The **Hotkey Menu** is easily recognized, as it partially hides the menu item where it was called from.



Fig. 101

Wheel →	Next Hotkey item
Wheel ←	Previous Hotkey item
Exit	Function depends on menu item
Enter	Function depends on menu item
Toggle	Exit Hotkey Menu

Rotating ← and → scrolls through the Hotkey menu items. The **Hotkey Menu** list can be traversed in both directions while the symbols < and > are visible. Whenever start or end point of the menu list have been reached, a | symbol appears indicating a dead stop.

Each menu item displays two functions. The **EXIT** key is associated to the upper function, the **ENTER** key to the lower one.

TOGGLE exits **Hotkey Menu**, and the display returns to the menu visible in background.

Room

This menu item gives access to **GATE** and **KILL** functions. These functions are first and foremost, but not necessarily, used in *Freeze room* setting.



Fig. 102

Wheel →	Next Hotkey item
Wheel ←	Previous Hotkey item (dead stop)
Exit	Enable/Disable Kill
Enter	Enable/Disable Gate
Toggle	Exit Hotkey Menu

Rotating ← and → scrolls through the *Hotkey* menu items.

EXIT enables or disables **KILL**. A checkmark ✓ indicates **KILL** is enabled.

KILL chockes all reverberation within the reverb room.

ENTER enables or disables **GATE**. A checkmark ✓ indicates **GATE** is enabled.

GATE closes the door to the reverb room for the input signal, clearing it opens the door again.

TOGGLE exits **Hotkey Menu**, and the display returns to the menu visible in background.

Note: The *Density* parameter also applies to the Freeze room. **Gate** will automatically be activated when entering the Freeze room, and deactivated when leaving it.

Note: Keys **XIT** and **ENT** react upon release only. This is counter-intuitive, but vital in order to distinguish them from the **TOGGLE** operation.

Mute Dry

This menu item is used to *mute* the *dry* or *all signal paths*.



Fig. 103

Wheel →	Next Hotkey item
Wheel ←	Previous Hotkey item
Exit	Enable/Disable Mute Dry
Enter	Enable/Disable Mute All
Toggle	Exit Hotkey Menu

Rotating ← and → scrolls through the *Hotkey* menu items.

EXIT enables or disables **Mute Dry**. A checkmark ✓ next to **Dry** in the center row indicates **Mute Dry** is enabled.

ENTER mutes all signal paths, allowing a quick way to mute all outputs. Hitting **ENTER** again re-enables all outputs to their previous settings.

Note: Function **Mute All** can also be accomplished by enabling **Mute Dry**, **Mute 1st**, and **Mute 2nd**. In this case however, disabling **Mute All** would not unmute the previous three mutes; those will have to be individually re-enabled then.

TOGGLE exits **Hotkey Menu**, and the display returns to the menu visible in background.

Note: Keys **XIT** and **ENT** react upon release only. This is counter-intuitive, but vital in order to distinguish them from the **TOGGLE** operation.

Mute 1st

This menu item is used to *mute* the *first* or *all signal paths*.



Fig. 104

Wheel →	Next Hotkey item
Wheel ←	Previous Hotkey item
Exit	Enable/Disable Mute 1st
Enter	Enable/Disable Mute All
Toggle	Exit Hotkey Menu

Rotating ← and → scrolls through the *Hotkey* menu items.

EXIT enables or disables **Mute 1st**. A checkmark ✓ next to **1st** in the center row indicates **Mute 1st** is enabled.

ENTER mutes all signal paths, allowing a quick way to mute all outputs. Hitting **ENTER** again re-enables all outputs to their previous setting.

Note: Function **Mute All** can also be accomplished by enabling **Mute Dry**, **Mute 1st**, and **Mute 2nd**. In this case however, disabling **Mute All** would not unmute the previous three mutes; those will have to be individually re-enabled then.

TOGGLE exits **Hotkey Menu**, and the display returns to the menu visible in background.

Note: Keys **XIT** and **ENT** react upon release only. This is counter-intuitive, but vital in order to distinguish them from the **TOGGLE** operation.

Mute 2nd

This menu item is used to *mute* the *second* or *all signal paths*.



Fig. 105

Wheel →	Next Hotkey item
Wheel ←	Previous Hotkey item
Exit	Enable/Disable Mute 2nd
Enter	Enable/Disable Mute All
Toggle	Exit Hotkey Menu

Rotating ← and → scrolls through the *Hotkey* menu items.

EXIT enables or disables **Mute 2nd**. A checkmark ✓ next to **2nd** in the center row indicates **Mute 2nd** is enabled.

ENTER mutes all signal paths, allowing a quick way to mute all outputs. Hitting **ENTER** again re-enables all outputs to their previous setting.

Note: Function **Mute All** can also be accomplished by enabling **Mute Dry**, **Mute 1st**, and **Mute 2nd**. In this case however, disabling **Mute All** would not unmute the previous three mutes; those will have to be individually re-enabled then.

TOGGLE exits **Hotkey Menu**, and the display returns to the menu visible in background.

Note: Keys **XIT** and **ENT** react upon release only. This is counter-intuitive, but vital in order to distinguish them from the **TOGGLE** operation.

Scratch and Bypass

This menu item gives access to *Scratch* and *Bypass* functions. Function *Scratch* toggles between Scratch Presets A or B. Function *Bypass* routes the input signal directly to the output.



Fig. 106

Wheel →	Next Hotkey item
Wheel ←	Previous Hotkey item
Exit	Toggle between ScratchA and ScratchB
Enter	Enable/Disable Bypass
Toggle	Exit Hotkey Menu

Rotating ← and → scrolls through the *Hotkey* menu items.

EXIT toggles between *Scratch A* and *Scratch B*.

ENTER enables or disables the *Bypass* function. A checkmark ✓ indicates **Bypass** is enabled. An active **Bypass** is displayed on the Overview display:

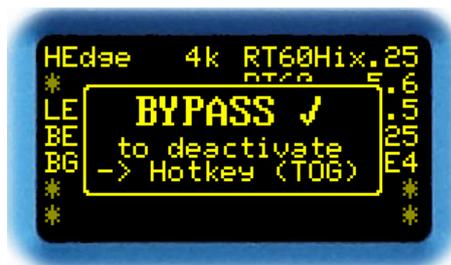


Fig. 107

The various devices behave as follows:

2492 and 2493: The input signal pair will be forwarded 1:1 to the output signal pair.

2496: The input signal pair will be forwarded to all output pairs.

2498: In 2→8 operation mode, the SYNC12 input pair will be forwarded to the OUT12 output pair; OUT34, OUT56, and OUT78 will all be muted.

2498: In 8→8 operation mode, the IN12 input pair will be forwarded to the OUT12 output pair. IN34 goes to OUT34, IN56 to OUT56, and IN78 to OUT78.

TOGGLE exits **Hotkey Menu**, and the display returns to the menu visible in background.

Note: In the **Bypass Mode** menu item (p. 144), the switching behavior of **Bypass** can be configured. If set to **HARD**, all inputs will be forwarding their input signal to their corresponding output(s) – bit by bit, and as fast as possible. As all sound effect algorithms induce some latency, so turning Bypass on and off will cause audible phase bumps. Alternatively, the **SOFT** setting can be used. Because of soft crossfade, audible clicks are being avoided.

Note: Keys **XIT** and **ENT** react upon release only. This is counter-intuitive, but vital in order to distinguish them from the **TOGGLE** operation.

Click Generator

This menu item allows turning on and off *a click test generator* and to adjust its *repetition rate*. The click test generator has been introduced with version 2.1.



Fig. 108

Wheel →	Next Hotkey item
Wheel ←	Previous Hotkey item
Exit	Change repetition rate
Enter	Enable/Disable click generator
Toggle	Exit Hotkey Menu

Rotating ← and → scrolls through the *Hotkey* menu items.

EXIT steps between repetition rates of **1**, **2**, or **5** seconds.

ENTER turns the click generator on or off. A checkmark ✓ indicates that the generator is running.

While the pulse generator is running, *all* input channels are driven by a 0dB full-level pulse of 56 to 78 μs width. Any regular audio payload will be temporarily displaced. The exact pulse width depends on the current sample rate:

- 38,5 kHz .. 54 kHz: 3 samples
- 77 kHz .. 108 kHz: 6 samples
- 154 kHz .. 216 kHz: 12 samples

TOGGLE exits **Hotkey Menu**, and the display returns to the menu visible in background.

Note: As useful as an A/B comparison with the *Bypass* function, it likewise makes sense to occasionally verify the characteristics of the current room by stimulating it with a click. That's why both functions have been placed side by side

Note: A listening test with a click signal may also come in handy for becoming acquainted with the impact of the various frequency-dependent RT60 filter parameters on room characteristics.

Note: Keys **XIT** and **ENT** react upon release only. This is counter-intuitive, but vital in order to distinguish them from the **TOGGLE** operation.

Parameter Up/Down

Depending on the unit or display mode, not all parameters can be shown on *one* Overview display page. In this case, this menu is used to **page through multiple Overview displays**.



Fig. 109

Wheel →	Next Hotkey item
Wheel ←	Previous Hotkey item
Exit	Page forward to the next Overview display
Enter	Page backward to the previous Overview display
Toggle	Exit Hotkey Menu

Rotating ← and → scrolls through the *Hotkey* menu items.

EXIT displays next Overview display page.

ENTER displays previous Overview display page.

TOGGLE exits **Hotkey Menu**, and the display returns to the menu visible in background.

Note: Keys **XIT** and **ENT** react upon release only. This is counter-intuitive, but vital in order to distinguish them from the **TOGGLE** operation.

Display Mode and Menu Shortcut

This menu item gives access to *Display Mode* and *Menu Shortcut* functions.



Fig. 110

Wheel →	Next Hotkey item
Wheel ←	Previous Hotkey item
Exit	Select Display mode
Enter	Swap menus
Toggle	Exit Hotkey Menu

Rotating ← and → scrolls through the *Hotkey* menu items.

EXIT selects one of various Overview display presentation modes outlined on p. 51.

ENTER directly jumps, through one of the menu shortcuts, to a previously selected distant menu position. The selected menu appears in the display background area.

There are 4 menu shortcuts. After initial software installation, the default menus refer to important main menu entry points. Using a shortcut allows the usual navigation through the entire menu. When switching to another shortcut, the present shortcut's menu position is being parked for subsequent return.

TOGGLE exits **Hotkey Menu**, and the display returns to the menu visible in background.

Note: Keys **XIT** and **ENT** react upon release only. This is counter-intuitive, but vital in order to distinguish them from the **TOGGLE** operation.

Scratch Dump to MIDI

This menu item has been introduced with version 3.1. It triggers a *manual* Scratch dump through the unit's *MIDI* port.



Fig. 111

Wheel →	Next Hotkey item (dead stop)
Wheel ←	Previous Hotkey item
Exit	Dump Scratch A
Enter	Not assigned
Toggle	Exit Hotkey Menu

Rotating ← and → scrolls through the *Hotkey* menu items.

EXIT triggers a *Scratch A* dump. Such a dump, encoded into a MIDI packet, can be recorded on a dedicated DAW MIDI track, a second or two before the start of a session. Whenever the session will be played back later, *Scratch A* will be reinitialized via MIDI. Regardless of the current contents of the *Scratch*, and independent of all *Presets* being installed in that unit or not. In other words: playback of a MIDI session works even with any interim or replacement unit.

TOGGLE exits **Hotkey Menu**, and the display returns to the menu visible in background.

Note: Keys **XIT** and **ENT** react upon release only. This is counter-intuitive, but vital in order to distinguish them from the **TOGGLE** operation.

Show T/C & ID

This main menu item is used to access *timecode* data and *origin and destination IDs* of the audio input and output channels. Depending on the unit, different menu items are available:

2492:

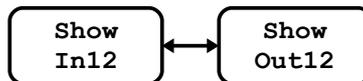


Fig. 112: 2492 show T/C & ID menu

2496:

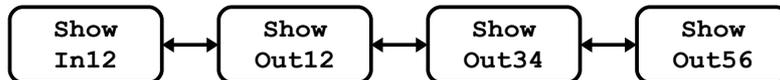


Fig. 113: 2496 show T/C & ID menu

2498:

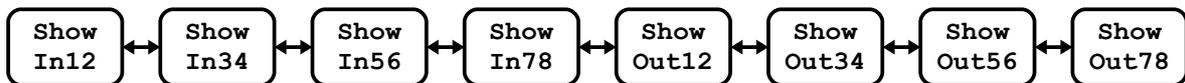


Fig. 114: 2498 show T/C & ID menu

Since these submenu items are arranged identically for all inputs and outputs, **Show In12** and **Show Out12** will be explained only.

Note: For a 2493, this menu item does not exist.

This main menu item appears as follows:

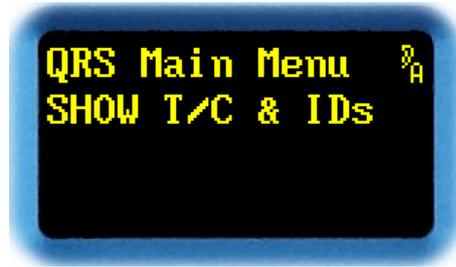


Fig. 115

Wheel →	Next main menu item
Wheel ←	Previous main menu item (dead stop)
Exit	Not assigned
Enter	Selects main menu item Show TCOD In 1+2
Toggle	Jump to Hotkey Menu

Show In12

This menu item is used to display *timecode data* and *origin and destination IDs* of the AES3 inputs. Certain units have more than one input, but their structures are identical.



Fig. 116

Wheel →	Next menu item
Wheel ←	Previous menu item (dead stop)
Exit	Go to main menu item Show T/C & ID
Enter	Not assigned
Toggle	Jump to Hotkey Menu

First line displays the AES3 input number, and potentially **C1kM** (»Clock Master«), to remind that this AES3 input supplies the master clock.

Second line shows the 4-byte **Origin ID** next to **O:**, and **Destination ID** next to **D:**. In this example, the inverted "0"s indicate that no ID has been assigned.

Third line shows **Local Sample Address** using **HH:MM:SS:FF** format (hours, minutes, seconds, and frames).

Fourth line shows **Time Of Day** using **HH:MM:SS:FF** format (hours, minutes, seconds, and frames).

Rotating ← and → selects next or previous AES3 interface.

EXIT returns to the **Show T/C & ID** main menu item.

Note: As there are two channels (left/right), the display alternates between the two every second.

Show Out12

This menu item is used to display *timecode data* and *origin and destination IDs* of the AES3 outputs. Certain units have more than one input, but their structures are identical.



Fig. 117

Wheel →	Next menu item
Wheel ←	Previous menu item (dead stop)
Exit	Go to main menu item Show T/C & ID
Enter	Not assigned
Toggle	Jump to Hotkey Menu

First line displays the AES3 output number.

Second line shows the 4-byte **Origin ID** next to **O:**, and **Destination ID** next to **D:**. In this example, the inverted "0"s indicate that no ID has been assigned. In a 2492, and 2496 the IDs can be changed in the **Channel Status Origin ID Source** (p. 159) and **Channel Status Destination ID Source** (p. 161) menu items.

Third line shows **Local Sample Address** using **HH:MM:SS:FF** format (hours, minutes, seconds, and frames).

Fourth line shows **Time Of Day** using **HH:MM:SS:FF** format (hours, minutes, seconds, and frames).

Rotating ← and → selects next AES3 interface.

EXIT returns to the **Show T/C & ID** main menu item.

Note: As there are two channels (left/right), the display alternates between the two every second.

System Setup

All *System Setup* settings are grouped into menus under **System Setup**. Due to the sheer number of submenu items, these items have been classified into the following menu groups:

2492, 2496:

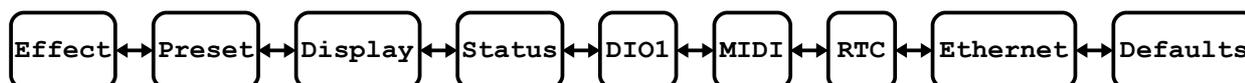


Fig. 118: 2492 and 2496 System Setup menu groups

2498:



Fig. 119: 2493 System Setup menu groups

2493:



Fig. 120: 2498 System Setup menu groups

The items specific to each menu group have been tabulated in the **Menu Groups** chapter on p. 116.

CAUTION! Since version 4.0, there is a distinction between *Device setup* and *Plug-in setup*.

Device setup applies to *all* plug-ins installed, and is stored globally. Menu groups **Display**, **Status**, **DIO1**, **DIO2**, **Analog**, **RTC**, and **Ethernet** are summarized there. Just one of the benefits: there is no need to configure an Ethernet connection for every plug-in.

Plug-in setup only applies for the plug-in currently running, and is stored in *this* bank only. **Effect**, **Preset**, and **MIDI** menu groups are summarized there. As various totally different types of plug-ins can be maintained in a single unit, a strict distinction is very useful here.

New
4.0

This main menu item appears as follows:



Fig. 121

Wheel	→	Next main menu item
Wheel	←	Previous main menu item
Exit		Not assigned
Enter		Go to Effect menu group
Toggle		Jump to Hotkey Menu

Rotating **←** and **→** scrolls through the main menu items.

ENTER selects the **System Setup** main menu item.

TOGGLE jumps to **Hotkey Menu**.

Menu Groups

This section describes *menu groups* under System Setup. The first one is called **Effect**.

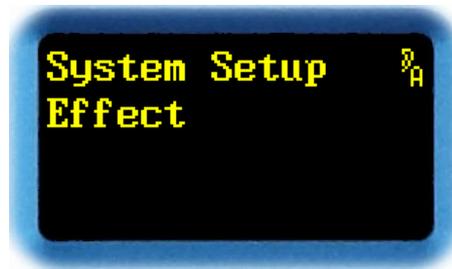


Fig. 122

Wheel →	Next menu group item
Wheel ←	Previous menu group item (dead stop)
Exit	Return to main menu item System Setup
Enter	Go to Effect menu group
Toggle	Jump to Hotkey Menu

Rotating ← and → scrolls through the *menu group* items.

EXIT returns to main menu.

ENTER jumps to selected menu group.

TOGGLE jumps to **Hotkey Menu**.

The menu groups are composed of the following items:

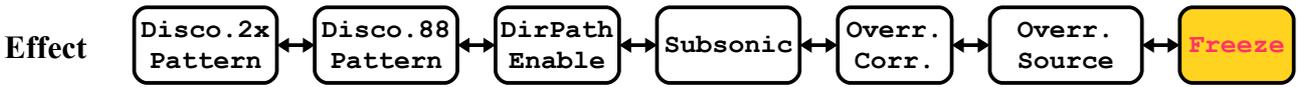


Fig. 123: Effect menu line-up

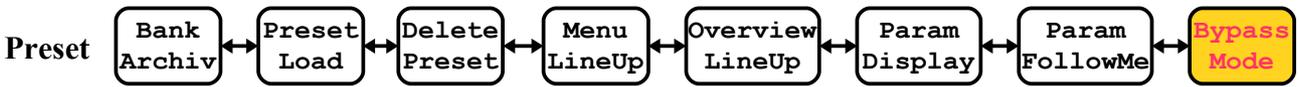


Fig. 124: Preset menu line-up



Fig. 125: Display menu line-up

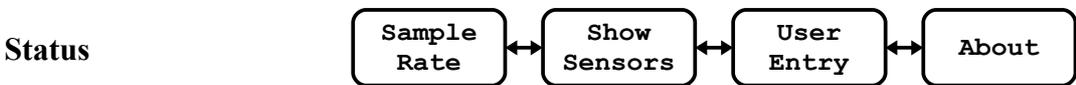


Fig. 126: Status menu line-up



Fig. 127: DIO1 menu line-up



Fig. 128: DIO2 menu line-up

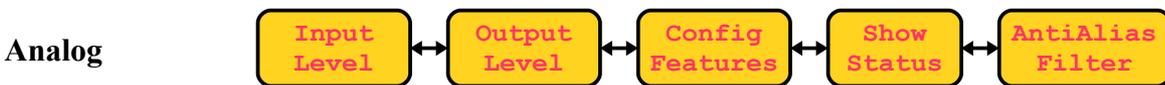


Fig. 129: Analog menu line-up

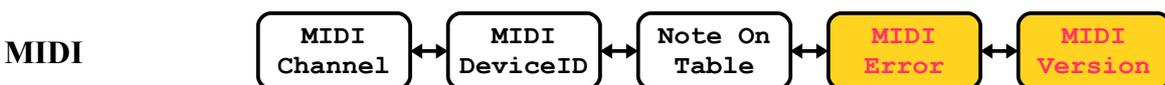


Fig. 130: MIDI menu line-up

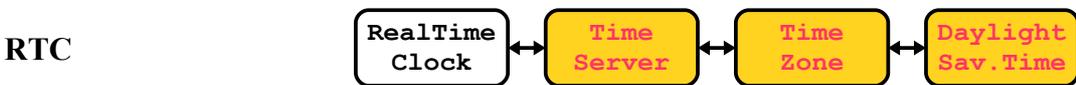


Fig. 131: RTC menu line-up



Fig. 132: Ethernet menu line-up



Fig. 133: Defaults menu line-up

Note: Submenu items in color-shaded boxes have been added recently.

Discorrelator Patterns 2x

This menu item is used to set *discorrelator* patterns for reverberation chamber outputs. This selection is valid for plug-ins with 2 inputs only. For a 2498, this means: valid for its 2→8 mode only. This parameter has been defined and discussed on p. 34 in the **Effect Setup Parameters** section.



Fig. 134

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Set output discorrelator pattern
Toggle	Jump to Hotkey Menu

Rotating ← and → scrolls through the menu group items.

EXIT return to the menu groups.

ENTER continues with configuring a discorrelator pattern for an output.

TOGGLE jumps to **Hotkey Menu**.

At this point, a prompt appears after **Output** – which can now be selected.



Fig. 135

Wheel	→	Next output
Wheel	←	Previous output
Exit		Exit selection
Enter		Confirm selection
Toggle		Jump to Hotkey Menu

Rotating **←** and **→** selects an output (2492/2493: 1 to 2, 2496: 1 to 6, 2498: 1 to 8).

EXIT exits selection.

ENTER confirms selection, and advances the cursor to pattern selection.

TOGGLE jumps to **Hotkey Menu**.

At this point, a prompt appears after **Pattern** – which can now be modified.



Fig. 136

Wheel →	Next pattern
Wheel ←	Previous pattern
Exit	Discard pattern
Enter	Confirm pattern
Toggle	Jump to Hotkey Menu

Rotating ← and → selects a pattern from a list. Size and numbering of the pattern list depends on the plug-in type. The numbering may be discontinuous due to the internal structures of the room models, but this is irrelevant to the user. There is an additional **OFF** pattern, which will be used to mute an unused output.

EXIT discards a modified pattern, and returns to output selection.

ENTER confirms a modified pattern, and returns to output selection.

TOGGLE jumps to **Hotkey Menu**.

Discorrelator Patterns 88

This menu item is used to set *discorrelator* patterns for reverberation chamber outputs. This selection is valid for 2498 plug-ins in 8→8 mode only. This parameter has been defined and discussed on p. 34 in the **Effect Setup Parameters** section.



Fig. 137

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Set output discorrelator pattern
Toggle	Jump to Hotkey Menu

Rotating ← and → scrolls through the menu group items.

EXIT return to the menu groups.

ENTER continues configuring a discorrelator pattern for an output.

TOGGLE jumps to **Hotkey Menu**.

At this point, a prompt appears after **Output** – which can now be selected.



Fig. 138

Wheel	→	Next outputs
Wheel	←	Previous outputs
Exit		Exit selection
Enter		Confirm selection
Toggle		Jump to Hotkey Menu

Rotating **←** and **→** selects one of the 8 outputs (2498: **1** to **8**).

EXIT exits selection.

ENTER confirms selection, and advances the cursor to pattern selection.

TOGGLE jumps to **Hotkey Menu**.

At this point, a prompt appears after **Pattern** – which can now be modified.



Fig. 139

Wheel →	Next pattern
Wheel ←	Previous pattern
Exit	Discard pattern
Enter	Confirm pattern
Toggle	Jump to Hotkey Menu

Rotating ← and → selects a pattern from a list. Size and numbering of the pattern list depends on the plug-in type. The numbering may be discontinuous due to the internal structures of the room models, but this is irrelevant to the user. There is an additional **OFF** pattern, which will be used to mute an unused output.

EXIT discards a modified pattern, and returns to output selection.

ENTER confirms a modified pattern, and returns to output selection.

TOGGLE jumps to **Hotkey Menu**.

Direct Path Enable

This menu item *enables or disables the direct path*. The reason why the direct path may be enabled or disabled has been discussed on p. 35 in the **Effect Setup Parameters** section.



Fig. 140

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Jump to enable/disable direct path
Toggle	Jump to Hotkey Menu

Rotating ← and → scrolls through the menu group items.

EXIT returns to the menu groups.

Hitting **ENTER** will open prompt, allowing the direct path to be set.

TOGGLE jumps to **Hotkey Menu**.

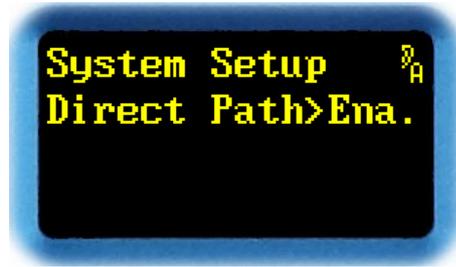


Fig. 141

Wheel	→	Enable direct path
Wheel	←	Disable direct path
Exit		Discard and restore previous value
Enter		Confirm new value
Toggle		Jump to Hotkey Menu

Rotating **→** and **←** toggles between enabling (**Ena.**) and disabling (**Dis.**) of the direct (dry) path.

EXIT discards the modified value, and restores the previously-stored value.

ENTER confirms the selected value.

TOGGLE jumps to **Hotkey Menu**.

Subsonic

This parameter has been introduced with version 2.3.

This menu item *allows or suppresses extra-low-frequency resonances* within the reverberation chamber. Arguments for enabling or disabling this type of resonances have been discussed on p. 35 in the **Effect Setup Parameters** section.



Fig. 142

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Jump to allow or suppress extra-low-frequency resonances
Toggle	Jump to Hotkey Menu

Rotating ← and → scrolls through the menu group items.

EXIT returns to the menu groups.

Hitting **ENTER** will open a prompt for allowing or suppressing extra-low-frequency resonances.

TOGGLE jumps to **Hotkey Menu**.

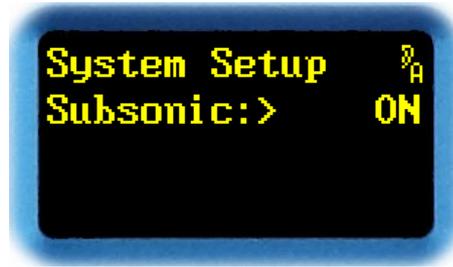


Fig. 143

Wheel →	Allow extra-low-frequency resonances
Wheel ←	Suppress extra-low-frequency resonances
Exit	Discard and restore previous value
Enter	Confirm new value
Toggle	Jump to Hotkey Menu

Rotating → and ← toggles between allowing (**ON**) or suppressing (**OFF**) the extra-low-frequency resonances.

EXIT discards the modified value, and restores the previously-stored value.

ENTER confirms the selected value.

TOGGLE jumps to **Hotkey Menu**.

Note: For a 2493, the setting has been fixed to **OFF**, as the subsonic filter is used as a DC-blocking filter for zero-point stabilization instead.

Override Correlation

This parameter has been introduced with version 2.0.

This menu item allows to temporarily displace the Preset value of the *2nd Correlation* parameter. The idea behind this has been outlined on p. 36 under the **Effect Setup Parameters** section.

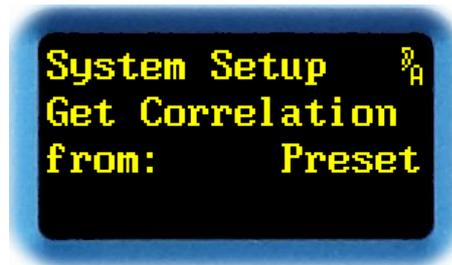


Fig. 144

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Modify setting
Toggle	Jump to Hotkey Menu

Rotating ← and → scrolls through the menu group items.

EXIT returns to the menu groups.

Hitting **ENTER** will open a prompt, allowing the setting to be changed.

TOGGLE jumps to **Hotkey Menu**.

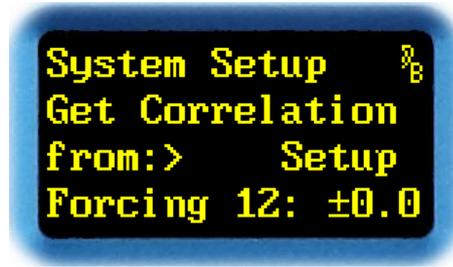


Fig. 145

Wheel →	Force correlation from Setup
Wheel ←	Allow correlation from Preset
Exit	Discard and restore previous value
Enter	Confirm new value
Toggle	Jump to Hotkey Menu

Rotating → and ← toggles between **Setup** and **Preset**.

Preset is the standard setting and uses the *correlation* value from the *2nd Correlation* parameter.

Setup overrides *Correlation* values from all Presets with a global setting from Setup. The *2nd Correlation* parameter will be grayed out, and may no longer be modified, neither in **Change Parameter A**, nor by the toggle switches or a remote control. It's always the active one which is being displayed.

EXIT discards the modified value, and restores the previously-stored value.

ENTER confirms the selected value. With **Preset**, one resorts to the selection of the menu items, while **Setup** enables entering an individual override value for each output pair. For 2492 and 2493, one may immediately assign a correlation value, while for 2496 and 2498, the next step is assigning an output pair.

TOGGLE jumps to **Hotkey Menu**.

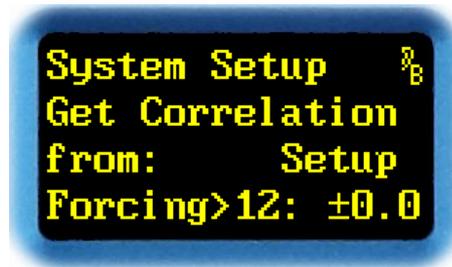


Fig. 146

Wheel →	Select output pair
Wheel ←	Select output pair
Exit	Discard selection
Enter	Confirm selection
Toggle	Jump to Hotkey Menu

Rotating → and ← selects the output pair to be modified.

ENTER confirms the output pair, and allows to pick and assign one of the correlation values.

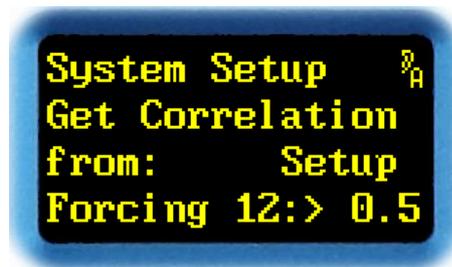


Fig. 147

Wheel →	Select new value
Wheel ←	Select new value
Exit	Discard and restore previous value
Enter	Confirm new value
Toggle	Jump to Hotkey Menu

Rotating ← and → sets the override value for *2nd Correlation*.

EXIT discards the modified value, and reloads the previous setting.

ENTER confirms the modified setting.

TOGGLE jumps to **Hotkey Menu**.

Override Dry/1st Source

This menu item allows to temporarily displace the Preset value of the *Dry Source* and *1st Source* parameters while operation mode 2→x is active. The idea behind this has been outlined on p. 36 under the **Effect Setup Parameters** section.

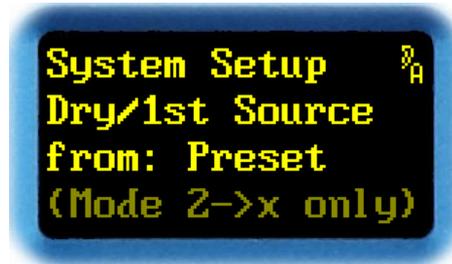


Fig. 148

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Modify setting
Toggle	Jump to Hotkey Menu

Rotating ← and → scrolls through the menu group items.

EXIT returns to the menu groups.

Hitting **ENTER** will open a prompt, allowing the setting to be changed..

TOGGLE jumps to **Hotkey Menu**.

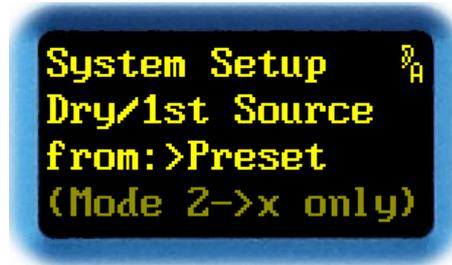


Fig. 149

Wheel →	Force <i>Dry/1st Source</i> to input 12
Wheel ←	Use <i>Dry/1st Source</i> of Preset
Exit	Discard and restore previous value
Enter	Confirm new value
Toggle	Jump to Hotkey Menu

Rotating → and ← selects **Preset** or **Input12/21**

For operation modes 2→x only, **Input12/21** forces all *Dry Source* and *Ist Source* parameters to **12** or **21**. The Source parameters may still be edited, but all **34**, **56**, and **78** settings will be redirected to **12**. In the same way, all **43**, **65**, and **87** settings will be redirected to **21**. For the display, all redirected settings are prepended by a dim **12** or **21**. When writing to a Preset, the brightly-displayed original values will be used.

Preset always uses *all* settings from the Preset.

EXIT discards the modified value, and restores the previously-stored value.

ENTER confirms the selected value.

TOGGLE jumps to **Hotkey Menu**.

Freeze

This parameter has been introduced with version 4.0.

This menu item is used to set whether all side chain paths are still active in the Freeze room, or the reverberation path alone. The reason why this makes sense has been outlined on p. 36.

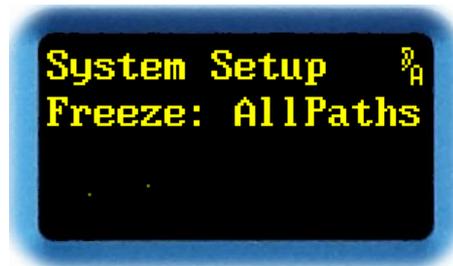


Fig. 150

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Modify setting
Toggle	Jump to Hotkey Menu

Hitting **ENTER** will open a prompt, allowing the setting to be changed..

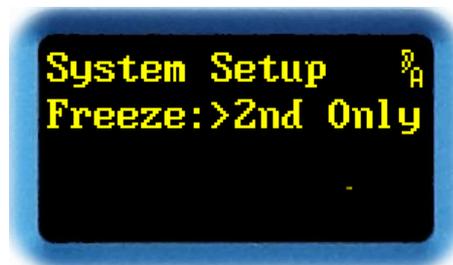


Fig. 151

Wheel →	Only reverberation path is active
Wheel ←	All paths are active
Exit	Discard and restore previous value
Enter	Confirm new value
Toggle	Jump to Hotkey Menu

Rotating **←** and **→** adjusts the behavior in Freeze room:

2nd Only	Nothing but the reverberation path is active. Direct path and first reflection are muted when entering the Freeze room.
AllPaths	In Freeze room, all paths are active.

EXIT discards the modified value, and restores the previously-stored value.

ENTER confirms the selected value.

Bank Archive

Since version 2.3, it is possible to tap a plug-in *from a foreign bank*, and load contents from there to the *local* Scratch. This menu item *registers the bank* to be used for this kind of Preset transfer.



Fig. 152

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Select Bank Archive
Toggle	Jump to Hotkey Menu

Hitting *ENTER* replaces the colon with a prompt.



Fig. 153

Wheel →	Select Bank Archive
Wheel ←	Select Bank Archive
Exit	Discard selection
Enter	Confirm selection
Toggle	Jump to Hotkey Menu

Rotating → and ← selects a bank, or disables any cross-references completely (**OFF**). A bank will only be advertised, if a *compatible* plug-in has been installed there. This is the reason for potential discontinuities in numbering. To help navigating through the plug-ins, the two lower rows show name, device type, and version number.

EXIT discards the modified value, and restores the previously-stored value.

ENTER confirms the selected value.

Note: Whenever a formerly registered bank becomes invalid, e.g. because of being erased, or being overwritten, *Bank Archive* will be reset to **OFF**.

Preset Load

This menu item is used to configure whether *a confirmation step is required or not* while selecting Presets from **Select Slot A** or **Select Slot B** menus.



Fig. 154

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Change the configuration
Toggle	Jump to Hotkey Menu

Hitting **ENTER** replaces the colon with a prompt, indicating that the configuration can be modified.



Fig. 155

Wheel →	Change configuration
Wheel ←	Change configuration
Exit	Discard selection
Enter	Confirm selection
Toggle	Jump to Hotkey Menu

Rotating → and ← changes the amount of steps required to select a Preset from **Select Slot A** (p. 209) or **Select Slot B** (p. 201) menus. Choosing **Select** loads a Preset immediately, whereas choosing **Enter** requires a confirmation with the **ENTER** key to load the Preset.

EXIT discards the modified value, and restores the previously-stored value.

ENTER confirms the selected value.

Hands On: fast switchover for jump cuts

The simplest way would be loading old and new room situation to Scratch A and B. When the jump cut occurs, simply hit the A/B button.

When switching between small rooms, there's only the gap due to the intentional *fading down* and *fading up* slopes. The larger the room size, the longer the transition will take, which, by surprise, will still sound organically. To name the numbers: 1E0=>5ms, 1E1=>15ms, 1E2=>40ms up to 1E6=>almost 1sec (always take the room size you are switching *to*).

For repeated jump cuts in rapid succession, select **Enter** mode first, then copy the required room sequence to adjacent Preset slots in the *Local* archive. By stepping the wheel, retrieve them sequentially, and eventually fire them off with the **ENTER** key.

Delete Presets

This menu item *deletes the contents* of one or all *slots* within the Local archive.



Fig. 156

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Go to slot selection
Toggle	Jump to Hotkey Menu

ENTER confirms the selection, and advances to slot selection.



Fig. 157

Wheel →	Select slot
Wheel ←	Select slot
Exit	Discard selection
Enter	Go to confirmation step
Toggle	Jump to Hotkey Menu

Rotating ← and → either selects the *global* (**AllSlots**) option, or allows for selecting a *single* slot in the range of **001** to **250**. Next to the slot number, the name of the Preset stored therein is shown.

EXIT discards the selection.

Caution: Contents of a deleted slot *cannot* be restored!

ENTER confirms selection, and advances to a confirmation step.

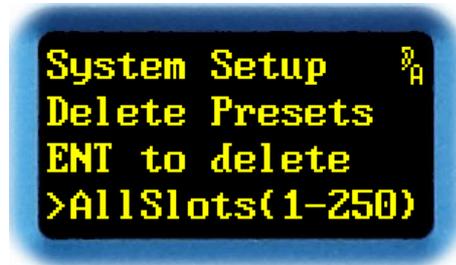


Fig. 158

Wheel →	Not assigned
Wheel ←	Not assigned
Exit	Discard
Enter	Erase slot
Toggle	Jump to Hotkey Menu

EXIT discards the confirmation step. The slot content remains unchanged.

ENTER erases the content of the selected slot, then returns back to selection, optionally allowing to erase another slot.

Menu Parameter Line Up

This menu item is used to *change the alignment of the Menu parameters* in the **Select Parameter A** and **Change Parameter A** main menu items, i.e. their presentation on the *Menu Display*.

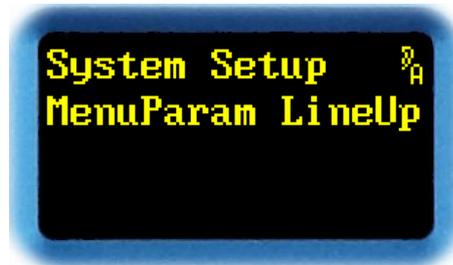


Fig. 159

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Edit parameter list
Toggle	Jump to Hotkey Menu

Hitting **ENTER** brings up a parameter, which can now be relocated.



Fig. 160

Wheel →	Next parameter position
Wheel ←	Previous parameter position
Exit	Discard selection
Enter	Confirm new value
Toggle	Selects a parameter

Rotating → and ← scrolls through the parameter positions in the range of **1** to **128**.

EXIT discards the modified line-up item.

ENTER confirms the targeted line-up item.

Hitting **TOGGLE** moves the prompt to the parameter name that may now be targeted.



Fig. 161

Wheel →	Next parameter
Wheel ←	Previous parameter
Exit	Discard selection
Enter	Confirm new value
Toggle	Select this parameter position

Rotating → and ← scrolls through the parameter list. The parameters vary depending on plug-in type. For the QRS plug-in, they are discussed starting with p. 23. There is no need for using up *all* parameters to configure a menu. If the parameters required have been included, terminate the list with the ***UNUSED*** keyword. Beyond this position, any display will be suppressed.

EXIT discards the modified value, and restores the previously-stored value.

ENTER confirms the selected value.

Hitting **TOGGLE** advances the prompt to the parameter position that may now be changed.

Overview Parameter Line Up

This menu item is used to change *the layout of the parameters* presented on the *Overview display*. All *Display modes* (see p. 51) may be configured individually.

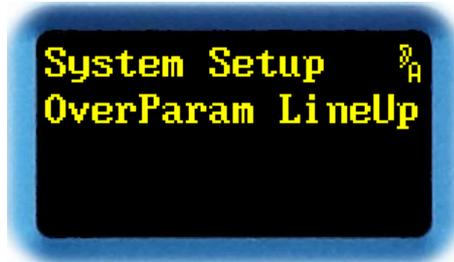


Fig. 162

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Edit parameter list
Toggle	Jump to Hotkey Menu

Hitting *ENTER* brings up a menu to select one of the Display modes.



Fig. 163

Wheel →	Select display mode
Wheel ←	Select display mode
Exit	Discard selection
Enter	Confirm new display mode
Toggle	Jump to Hotkey Menu

Rotating → and ← selects a display mode.

EXIT quits selection.

ENTER confirms selection, and opens a menu to configure the parameter position layout.



Fig. 164

Wheel →	Next parameter position
Wheel ←	Previous parameter position
Exit	Discard selection
Enter	Confirm new value
Toggle	Selects a parameter

Rotating → and ← scrolls through the parameter positions in the range of **1** to **128**. The order of the parameters in the Overview display is first from left to right, then top to bottom.

EXIT discards the modified value.

ENTER confirms the selected value.

Hitting **TOGGLE** moves the prompt to the parameter name that may now be changed.



Fig. 165

Wheel →	Next parameter
Wheel ←	Previous parameter
Exit	Discard selection
Enter	Confirm new value
Toggle	Select this parameter position

Rotating → and ← scrolls through the parameter list. The parameters vary depending on the type of plug-in. The parameters are discussed starting with p. 23. An intentional gap in the list may be inserted using the ***EMPTY*** keyword. The ***UNUSED*** keyword is used to indicate the end of the list – from thereafter, all parameters appear blank.

EXIT discards the modified value, and restores the previously-stored value.

ENTER confirms the selected value.

Hitting **TOGGLE** moves the prompt to the parameter position that may now be changed.

Parameter Display Type

This menu item is used to change the *parameter appearance* in the **Select Parameter A** and **Change Parameter A** main menu items.



Fig. 166

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Configure appearance
Toggle	Jump to Hotkey Menu

Hitting **ENTER** replaces the colon with a prompt.



Fig. 167

Wheel →	Next appearance type
Wheel ←	Previous appearance type
Exit	Discard selection
Enter	Confirm new value
Toggle	Jump to Hotkey Menu

Rotating → and ← scrolls through appearance types 1 to 3. Lines 3 and 4 immediately reflect the effect on font and style of the appearance type.

EXIT discards the modified value, and restores the previously-stored value.

ENTER confirms the selected value.

TOGGLE jumps to **Hotkey Menu**.

Parameter Follow Me

This menu item is used to change the *behavior of the Select Parameter A and Change Parameter A main menu items* when *accessing parameters via toggle keys*.



Fig. 168

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Configure <i>Parameter Follow Me</i>
Toggle	Jump to Hotkey Menu

Hitting *ENTER* replaces the colon with a prompt.



Fig. 169

Wheel →	Enable <i>Parameter Follow Me</i>
Wheel ←	Disable <i>Parameter Follow Me</i>
Exit	Discard selection
Enter	Confirm new value
Toggle	Jump to Hotkey Menu

Rotating → and ← toggles *Parameter Follow Me* (ON) or (OFF). While in **Select Parameter A** or **Change Parameter A** with *Parameter Follow Me* turned on, the Menu display and input wheel automatically skip in real-time to the parameter being accessed from the parameter toggle key.

EXIT discards the modified value, and restores the previously-stored value.

ENTER confirms the selected value.

TOGGLE jumps to **Hotkey Menu**.

New 4.0 Bypass Mode

This parameter has been introduced with version 4.0, to define *Bypass function behavior* (see p. 102).



Fig. 170

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Configure <i>Bypass mode</i>
Toggle	Jump to Hotkey Menu

Hitting **ENTER** replaces the colon with a prompt.



Fig. 171

Wheel →	<i>Bypass mode</i> SOFT
Wheel ←	<i>Bypass mode</i> HARD
Exit	Discard selection
Enter	Confirm new value
Toggle	Jump to Hotkey Menu

Rotating → and ← changes the *Bypass mode*:

SOFT	Bypass function is implemented <i>within</i> the algorithm by soft cross-fading of the level controls.
HARD	Bypass function is implemented <i>outside</i> the algorithm by a hard switchover to directly propagating the input signal to the outputs. This mode directly copies bit by bit.

EXIT discards the modified value, and restores the previously-stored value.

ENTER confirms the selected value.

Display Contrast

This menu item is used to *adjust display contrast*.



Fig. 172

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Adjust contrast
Toggle	Jump to Hotkey Menu

Hitting *ENTER* replaces the colon with a prompt.



Fig. 173

Wheel →	Increase contrast
Wheel ←	Decrease contrast
Exit	Discard and restore previous value
Enter	Confirm new value
Toggle	Jump to Hotkey Menu

Rotating → and ← adjusts display contrast to values in the range of 1 to 127. The immediate effect can be seen on the bottom gray level scale.

EXIT discards the modified value, and restores the previously-stored value.

ENTER confirms the selected value.

TOGGLE jumps to **Hotkey Menu**.

Note: High contrast levels accelerate burnout, and *lower life expectancy* of the OLED displays.

Screen Saver

This parameter has been introduced with version 4.0.

In this menu item, a *screen saver* for both OLED displays can be configured. By using a screen saver, *burnout* of the displays may be *prevented*, and *life expectancy* will be *increased*.

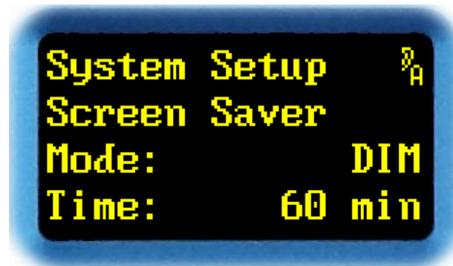


Fig. 174

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Select Screen Saver mode
Toggle	Jump to Hotkey Menu

There are several screen saver modes:

OFF	Screen saver disabled; <i>not recommended!</i>
DIM	Screen saver active. After timeout, display will be dimmed, but contents is still recognizable. This mode reduces burnout and increases life expectancy. Recommended for front panel operation.
SCROLL	Screen saver active. After timeout, contents starts to be shifted cyclically across the display. This mode increases life expectancy.
DARK	Screen saver active. After timeout, display turns black, contents is no longer visible. This mode prevents burnout completely, and increases life expectancy. Preferred choice for remote control operation, if a YARSTICK is installed in a separate equipment room.

With **ENTER**, a prompt appears in the 3rd row, and screen saver *mode* can be changed:



Fig. 175

Wheel →	Change mode
Wheel ←	Change mode
Exit	Discard and restore previous value
Enter	Confirm new value
Toggle	Jump to Hotkey Menu

Rotating → and ← changes the mode to **OFF**, **DIM**, **SCROLL**, or **DARK**.

EXIT discards modified value, and restores the previously-stored value.

ENTER confirms the selected value. Now a prompt appears in the 4th row, and *timeout* can be selected:

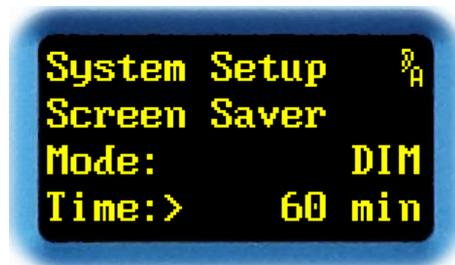


Fig. 176

Wheel →	Increase timeout
Wheel ←	Decrease timeout
Exit	Discard and restore previous value
Enter	Confirm new value
Toggle	Jump to Hotkey Menu

Rotating → and ← assigns timeout values of **5 min**, **10 min**, **20 min**, **30 min**, or **60 min**. To test the screen saver, there is also a **5 sec** setting. With this setting, the screen saver starts after just 5 seconds.

EXIT discards the modified value, and restores the previously-stored value.

ENTER confirms the selected value.

TOGGLE jumps to **Hotkey Menu**.

Note: Since version 4.2, the screen saver affects **LED Intensity** (see p. 149) as well.

Bargraph Decay

This menu item is used to adjust *bargraph decay rate*.



Fig. 177

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Adjust decay rate
Toggle	Jump to Hotkey Menu

Hitting *ENTER* will open a prompt.



Fig. 178

Wheel →	Increase decay rate
Wheel ←	Decrease decay rate
Exit	Discard and restore previous value
Enter	Confirm new value
Toggle	Jump to Hotkey Menu

Rotating → and ← adjusts bargraph decay rate to values of **2.5s**, **5s**, or **10s**.

EXIT discards the modified value, and restores the previously-stored value.

ENTER confirms the selected value.

TOGGLE jumps to **Hotkey Menu**.

Note: Decay rate is the time required for a bargraph to fall by 20 dB. This is not the time until the entire bargraph chain LEDs go out. Large dB jumps take longer than short ones.

LED Intensity

This menu item is used to adjust *bargraph and status LED brightness*.

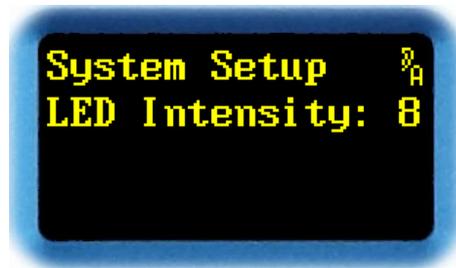


Fig. 179

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Adjust brightness
Toggle	Jump to Hotkey Menu

Hitting *ENTER* replaces the colon with a prompt.

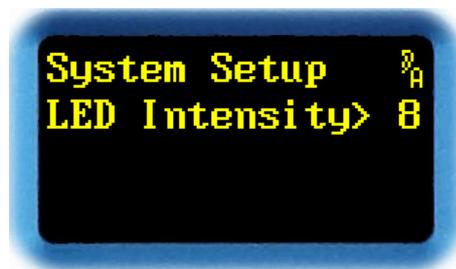


Fig. 180

Wheel →	Increase brightness
Wheel ←	Decrease brightness
Exit	Discard and restore previous value
Enter	Confirm new value
Toggle	Jump to Hotkey Menu

Rotating → and ← adjusts LED intensity with values of 1 to 15.

EXIT discards the modified value, and restores the previously-stored value.

ENTER confirms the selected value.

TOGGLE jumps to **Hotkey Menu**.

Note: Since Version 4.2, the screen saver (see p. 146) affects LED brightness as well.

Show Sample Rate

This menu item *shows* both the *measured sample rate* and the *sample rate* deducted from *Channel Status* data.

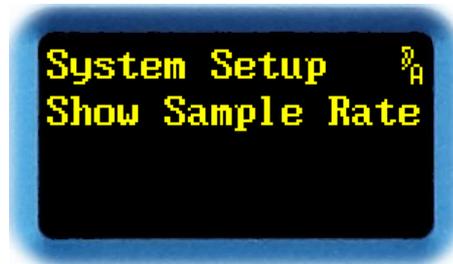


Fig. 181

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Display sample rates
Toggle	Jump to Hotkey Menu

ENTER brings up the sample rate values.

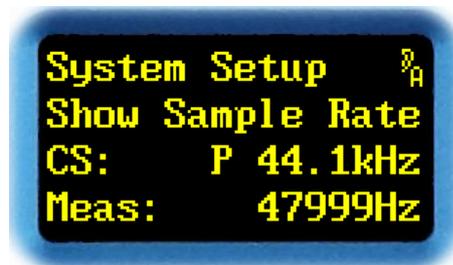


Fig. 182

Wheel →	Not assigned
Wheel ←	Not assigned
Exit	Return
Enter	Return
Toggle	Jump to Hotkey Menu

The third line shows the sample rate deducted from Channel Status data. A **P** or **C** prefix indicates *Professional* or *Consumer* Channel Status format. The fourth line shows the sample rate measured by a frequency counter. All readouts refer to the manually or automatically selected clock source.

In the above example, both sample rates are inconsistent. Either Channel Status data at the AES3 input have been assigned erroneously, or the studio is being operated on +8.8 % varispeed.

Both **EXIT** and **ENTER** close the display.

Show Sensors

This menu item displays *internal voltage and temperature sensor values*. Moreover, since version 3.0, an *elapsed hour counter* may be displayed here.



Fig. 183

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Display value for this sensor
Toggle	Jump to Hotkey Menu

ENTER brings up the sensor measurements.

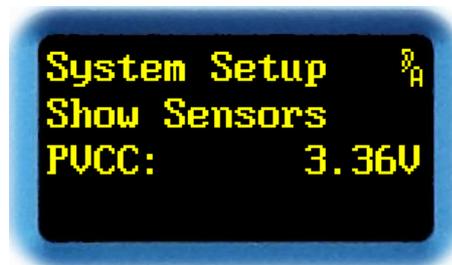


Fig. 184

Wheel →	Next sensor
Wheel ←	Previous sensor
Exit	Return
Enter	Return
Toggle	Jump to Hotkey Menu

Rotating → and ← displays all voltage and temperature sensor values, and an elapsed hour counter. These values have been made available to help reporting functional problems. They strongly depend on hardware version and operating status of the unit, so providing nominal values here would be of no long-term practical use.

EXIT and **ENTER** return to the previous menu.

TOGGLE jumps to **Hotkey Menu**.

List of Power Supply Sensors:

PVCC	3.3 V power supply (voltage)
PV50	5 V power supply (voltage)
PVCORE	Core power supply (voltage)
PTEMP	Temp and voltage sensor IC (temperature)
PTCOOL	Filter capacitors (temperature) (<i>»cool spot«</i>)
PTHOT	Schottky diode (temperature) (<i>»hot spot«</i>)

List of Control-I/O Sensors:

CVCC	3.3 V power supply (voltage)
CV232	RS-232 power supply (voltage)
CVUSB	USB power supply (voltage)
CTBAT	RTC Lithium battery (temperature)

List of Auxiliary Sensors:

Elapsed	Elapsed hour counter
----------------	----------------------

User Entry

This menu item is used to display and *assign a name* of up to 16 characters to this YARDSTICK.



Fig. 185

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Change unit name
Toggle	Jump to Hotkey Menu

The unit name is mainly used *to identify* a YARDSTICK, e.g. when operating via web browser or another type of remote control.

How this input is displayed on a web browser can be seen in Fig. 79 on p. 78, right from the center in the topmost row.

Hitting **ENTER** allows to input a new name.



Fig. 186

Wheel →	Next ASCII character
Wheel ←	Previous ASCII character
Exit	Discard and restore the previous unit name
Enter	Store the new unit name
Toggle	Move cursor to the right

The third line displays the current unit name. In this example, the cursor underlines the first character **Q**.

Rotating → and ← scrolls through the ASCII characters for the underlined character. ASCII characters include capitals, numerical, and symbolic characters.

Hitting **TOGGLE** accepts a character, and advances the cursor to the right. Moving beyond the rightmost position returns the cursor back to start of text string.

Hitting **EXIT** replaces the modified unit name with the previously-stored one.

Once the name has been entered correctly, hitting **ENTER** stores it.

About

This menu item is used to display *Hardware* and *Software type, plug-in name, version number*, and internal personal ID (*»PID#«*).



Fig. 187

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Show software information
Toggle	Jump to Hotkey Menu

Hitting *ENTER* reveals plug-in name and version, and the HW device type expected by the plug-in.

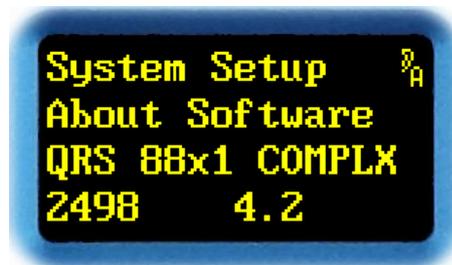


Fig. 188

Wheel →	Not assigned
Wheel ←	Not assigned
Exit	Return to previous menu
Enter	Show hardware information
Toggle	Return to previous menu

Note: Inconsistent device numbers (*»249x«*) in hardware and software versions indicate an incorrect plug-in type that has been installed, in spite of a warning message from the installation tool. This may lead to undefined behavior and stability problems!

Hitting **ENTER** reveals both device type and hardware version number.

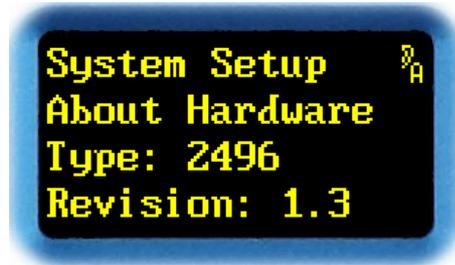


Fig. 189

Wheel →	Not assigned
Wheel ←	Not assigned
Exit	Terminate About display
Enter	Display PID#
Toggle	Terminate About display

ENTER displays the Personal ID (»PID#«) assigned to this particular YARDSTICK.



Fig. 190

The last PID digits are always set to the unit's serial number. In this example, the unit's serial number is **00265**.

Hitting any key at this point returns to the version number display.

Note: Inconsistent device numbers (»249x«) in hardware and software versions indicate an incorrect plug-in type that has been installed, in spite of a warning message from the installation tool. This may lead to undefined behavior and stability problems!

Input Error Mask

This menu item is used to enable or disable *input error notifications*.



Fig. 191

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Select error source
Toggle	Jump to Hotkey Menu

Hitting *ENTER* selects an error source.



Fig. 192

Wheel →	Next error source
Wheel ←	Previous error source
Exit	Discard and return to previous menu
Enter	Modify mask for this error source
Toggle	Jump to Hotkey Menu

Rotating → and ← scrolls through the possible detected error sources:

Prty Error	Parity Error: binary sum on samples block not equal to block parity
BPhs Error	Bi-Phase Error: errors in detecting the bi-phase coded signal.
Conf Error	Confidence Error: signal level too low
Vldty Error	Validity Error: audio signal not valid
CSCRC Error	Channel Status Cyclic Redundancy Check Error
Slip Error	Slip Error: friction of input sample rate against an external or internal clock source

EXIT discards the selection.

Hitting **ENTER** will open a prompt next to the error code:



Fig. 193

Wheel →	Include error source
Wheel ←	Ignore error source
Exit	Discard and restore previous value
Enter	Confirm new value
Toggle	Jump to Hotkey Menu

Rotating → and ← includes (**On**) or ignores (**Off**) an error source on the Lock LED.

EXIT discards the modified value, and restores the previously-stored value.

ENTER confirms the selected value.

TOGGLE jumps to **Hotkey Menu**.

Note: This menu item enables you to conduct research regarding the cause of a red Lock LED. Simply turn-off all error source types, one after the other, until the LED turns green again. If you are done, don't forget to enable all unnecessarily mapped-out error sources again, to ensure that future errors will be noticed immediately and reliably.

Channel Status Origin ID Source

This menu item is used to set the *source* of the *AES3 Channel Status Origin ID*.



Fig. 194

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Select ID source
Toggle	Jump to Hotkey Menu

Hitting **ENTER** replaces the colon with a prompt. The handling of the *Channel Status Origin ID* can now be changed.



Fig. 195

Wheel →	Next source
Wheel ←	Previous source
Exit	Discard and restore previous value
Enter	Confirm new value
Toggle	Jump to Hotkey Menu

Rotating → and ← toggles the *Channel Status Origin ID* source between **INPUT** or **FORCE**. Setting the source to **INPUT** relays the incoming *Channel Status Origin ID* unmodified. Setting the source to **FORCE** replaces the incoming *Channel Status Origin ID* with a user-defined identifier.

EXIT discards the modified value, and restores the previously-stored value.

TOGGLE jumps to **Hotkey Menu**.

ENTER confirms the new setting. If **FORCE** setting was selected, a 4-character identifier must be defined.



Fig. 196

Wheel →	Next ASCII character
Wheel ←	Previous ASCII character
Exit	Discard setting
Enter	Store ASCII character
Toggle	Move cursor to the right

Rotating → and ← scrolls through the ASCII character table for the underlined character. ASCII characters include capitals, numerical, and symbolic characters.

EXIT discards any changes in handling of *Channel Status Origin ID*.

ENTER confirms the new character, and advances the cursor to the next character position.

Hitting **TOGGLE** advances the cursor to the next character position. Moving right beyond the rightmost position returns the cursor back to start of text string.

Note: This function only operates on *Professional* Channel Status Format. An input having *Consumer* Channel Status Format will always be relayed without modification. Settings from this menu item will be ignored.

Channel Status Destination ID Source

This menu item is used to set the *source* of the *AES3 Channel Status Destination ID*.



Fig. 197

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Select ID source
Toggle	Jump to Hotkey Menu

Hitting *ENTER* replaces the colon with a prompt. The handling of the *Channel Status Destination ID* can now be changed.



Fig. 198

Wheel →	Next source
Wheel ←	Previous source
Exit	Discard and restore previous value
Enter	Confirm new value
Toggle	Jump to Hotkey Menu

Rotating → and ← toggles the *Channel Status Destination ID* source between **INPUT** or **FORCE**. Setting the source to **INPUT** relays the incoming *Channel Status Destination ID* unmodified. Setting the source to **FORCE** replaces the incoming *Channel Status Destination ID* with a user-defined identifier.

EXIT discards the modified value, and restores the previously-stored value.

TOGGLE jumps to **Hotkey Menu**.

ENTER confirms the new setting. If the **FORCE** setting was selected, a 4-character identifier must be defined.



Fig. 199

Wheel →	Next ASCII character
Wheel ←	Previous ASCII character
Exit	Discard setting
Enter	Store ASCII character
Toggle	Move cursor to the right

Rotating → and ← scrolls through the ASCII character table for the underlined character. ASCII characters include capitals, numerical, and symbolic characters.

EXIT discards any changes in handling of *Channel Status Destination ID*.

ENTER confirms the new character, and advances the cursor to the next character position.

Hitting **TOGGLE** advances the cursor to the next character position. Moving right beyond the rightmost position returns the cursor back to start of text string.

Note: This function only operates on *Professional* Channel Status Format. An input having *Consumer* Channel Status Format will always be relayed without modification. Settings from this menu item will be ignored.

Noise Shaper

This menu item is used to enable or disable a *16-bit Noise Shaper*.



Fig. 200

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Change noise shaper
Toggle	Jump to Hotkey Menu

Hitting *ENTER* replaces the colon with a prompt. The noise shaper can now be enabled or disabled.



Fig. 201

Wheel →	Enable noise-shaping
Wheel ←	Disable noise-shaping
Exit	Discard and restore previous value
Enter	Confirm new value
Toggle	Jump to Hotkey Menu

Rotating → and ← toggles between noise shaper (**ON**) or (**OFF**).

The noise shaper is located near the output just before the line driver. It accumulates the bits lost due to 16-bit truncation until a carry-over to the 16-bit LSB appears, then adds this overflow bit to the outgoing 16-bit data stream. Bit 17 to 24 on the outgoing interface are all set to '0'.

EXIT discards the modified value, and restores the previously-stored value.

ENTER confirms the selected value.

TOGGLE jumps to **Hotkey Menu**.

Sample Rate Reference

This menu item sets the reference, or equivalently, the *nominal sample rate*. This parameter is briefly discussed on p. 36 in the **Effect Setup Parameters** section.

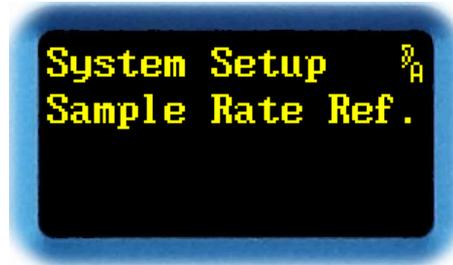


Fig. 202

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Select the sample rate information source
Toggle	Jump to Hotkey Menu

Rotating ← and → scrolls through the menu group items.

EXIT returns to the menu groups.

ENTER proceeds to the next menu to select the sample rate information source.

TOGGLE jumps to **Hotkey Menu**.



Fig. 203

Wheel →	Next source
Wheel ←	Previous source
Exit	Discard and restore previous value
Enter	Confirm new value
Toggle	Jump to Hotkey Menu

Rotating ← and → steps through all sample rate choices:

FIX 44.1	<i>Always</i> lock to one of the standard rates of 44.1 kHz, 88.2 kHz, or 176.4 kHz. Measurement determines which one of the three is used.
FIX 48	<i>Always</i> lock to one of the standard rates of 48 kHz, 96 kHz, or 192 kHz. Measurement determines which one of the three is used.
CS FB=FIX 44.1	Use the input <i>Channel Status data</i> to determine sample rate. If more than one input is present, the dedicated master clock input (Clock Config p. 166) is used. Should this rate differ from the measured one, sample rate reference falls back to FIX 44.1 .
CS FB=FIX 48	Use the input <i>Channel Status data</i> to determine sample rate. If more than one input is present, the dedicated master clock input (Clock Config p. 166) is used. Should this rate differ from the measured one, sample rate reference falls back to FIX 48 .
CS FB=MEAS	Use the input <i>Channel Status data</i> to determine sample rate. If more than one input is present, the dedicated master clock input (Clock Config p. 166) is used. Should this rate differ from the measured one, sample rate reference falls back to the measured one.
MEASURE	WARNING: Using <i>varispeed</i> may cause ambiguity problems. Sample rate is set to the measured input sample rate. If more than one input is present, the dedicated master clock input (Clock Config p. 166) is used. WARNING: Using <i>varispeed</i> may cause ambiguity problems.

EXIT discards the modified value.

ENTER confirms the selected value.

TOGGLE jumps to **Hotkey Menu**.

Clock Config

This menu item is used to configure a *2498 clock source*.



Fig. 204

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Change clock source
Toggle	Jump to Hotkey Menu

Hitting *ENTER* replaces the colon with a prompt.



Fig. 205

Wheel →	Modify clock source
Wheel ←	Modify clock source
Exit	Discard and restore previous value
Enter	Confirm new value
Toggle	Jump to Hotkey Menu

With → or ← the clock source may be one of **AUTO**, **SYNC**, **IN12**, **IN34**, **IN56**, or **IN78**. The selected input will act as a master clock for the unit. When **AUTO** has been selected, master clock will automatically be negotiated amongst the locked inputs. Priority order of the inputs is: *SYNC*, *IN12*, *IN34*, *IN56*, and *IN78*.

EXIT discards the modified value, and restores the previously-stored value.

ENTER confirms the selected value.

TOGGLE jumps to **Hotkey Menu**.

Note: Due to the surprisingly high input sensitivity, which is mandatory to comply with AES3, there's a certain risk of hostile crosstalk against unused inputs. Those interferences may be rather weak, but their logic frames, at least sporadically, may still be compliant to what's expected by the 2498 decoding logic. Since any recomposition of the various input signals, whether intentional or by hazard, will trigger a re-synchronization, there may be sporadic glitches and gaps in the audio signal.

If you experience such problems, try terminating the unused inputs with a low impedance (e.g. connect signal lines [+]/[-] with each other, or to XLR ground pin 1). In particular, verify whether temporarily deactivated cable driver outputs (e.g. within your audio crossbar) are properly terminated with low impedance while inactive. Especially watch out for floating (*»tri-state«*) drivers, which are the major cause for sensitive input lines to catch adjacent signals.

You're on the safe side if you routinely feed an input signal, or at least an *"alibi"* house clock, into the dedicated XLR SYNC input. The idea is that XLR SYNC is invariably the highest-priority clock input, so any perturbations within lower-priority inputs cannot accidentally trigger a reconfiguration of the input structure.

If you don't succeed in stabilizing your hardware, you're advised to avoid the **Auto** setting.

Medium-term, there may be new ideas to improve decision logic stability, so regularly watch out for updated software. The latest DIO2 drivers (version 1.5 as of March 2014) and plug-ins can be downloaded from www.quantec.com?2498plugins.

Show DIO2 Version

This menu item exists for the **2498** only. It displays the driver version for the DIO2 I/O module.



Fig. 206

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Not assigned
Toggle	Jump to Hotkey Menu

During initialization, all plug-ins check whether an appropriate I/O driver has been pre-installed. If that driver is out of date, a warning message will be displayed for 5 seconds. Up-to-date drivers are available for download from the QUANTEC website at www.quantec.com?2498plugins.

Option 1: An EXE file can be installed via serial interface. This option requires a Windows PC, and a standard RS-232 null-modem cable.

Option 2: A QYC file contains an installer, and will be installed similar to a plug-in – i.e. via web browser to a free bank. Subsequently, this bank needs to be booted from, which eventually triggers the actual installation. This option requires physical access to the unit – this kind of installer cannot be be correctly handled through a web browser, as connection will be dropped amidst the procedure. When finished with driver installation, explicitly clear that "borrowed" driver installation bank to prevent future confusion. For details, see **Manual Boot** (p. 222).

Note: If an obsolete DIO2 driver is being detected, an error message will be displayed at power up for about 5 s. Obsolete drivers usually can be adequately handled by newer plug-ins, but newer features and improvements may be missing. Older plug-ins usually co-operate with new drivers, but may have difficulties of correctly recognizing the new driver. In other words, older plug-ins may trigger an error, complaining an inappropriate driver, although an even newer, perfectly compatible driver has already been installed.

Note: In order to install a new driver with the *QYC file* method, the driver already installed in the unit is required to be version 1.2 as minimum. Otherwise, the *EXE file* method needs to be used.

Calibrate DIO2

New
4.2

This menu item exists for the **2498** only. Here you can calibrate the TCXO crystal oscillator that is used to measure the sample rate, in regular intervals, to an accuracy of ± 1 ppm.



Fig. 207

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	calibrate oscillator
Toggle	Jump to Hotkey Menu

ENTER calibrates the oscillator. Therefore, a highly accurate reference clock must be injected.

Regardless of the setting in **Clock Config** (see p. 166), the clock source will temporarily be changed to **Auto** while in this menu item. If still no input clock can be detected, the following message will be displayed:



Fig. 208

If a valid input clock is being injected, the measured sample rate is displayed after **Trim**. The closest *nominal* sample rate appears in the lowest row:



Fig. 209

Wheel →	Modify calibration
Wheel ←	Modify calibration
Exit	Discard and restore previous value
Enter	Confirm new value
Toggle	Jump to Hotkey Menu

Adjacent to the **>**, an abstract number without unit is being displayed. With **→** and **←** this number can be changed between **-89** and **+65**. The adjustable range corresponds to approximately 1 Hz at 48 kHz. The numbers only show an indication. A change towards positive reduces the measured frequency value, a change towards negative increases it. To calibrate the oscillator, change the number until both frequency values match.

About every 3-4 seconds, a new frequency measurement is being initiated. A ***** after **Trim** indicates that the last measurement was discarded. Caused by a device-internal resource conflict, discarded results are no indication for problems with the supplied reference clock.

EXIT discards a modified value, and restores the previously-stored value.

ENTER confirms the selected value.

TOGGLE jumps to **Hotkey Menu**.

Note: If the TCXO built into the YARDSTICK should be used for a measurement accuracy of ± 1 ppm, an annual calibration is recommended as a minimum.

Note: The adjustable range for calibration depends on the crystal used, and can be different depending on the production run.

Note: It is recommended to choose a reference clock of 44.1 kHz or 48 kHz, since higher sample rates increase the risk of device-internal resource conflicts.

Note: Crabwise it's also possible to calibrate based on an inaccurate reference clock, as long as its deviation is exactly known.

Analog Input Level

New
4.0

This menu item exists for a **2493** only. Here, you can configure the *nominal level* of the *analog inputs*.

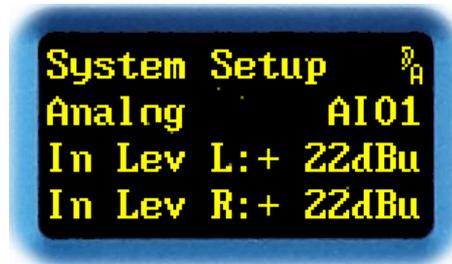


Fig. 210

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Configure input level
Toggle	Jump to Hotkey Menu

Hitting **ENTER** replaces the colon with a prompt.

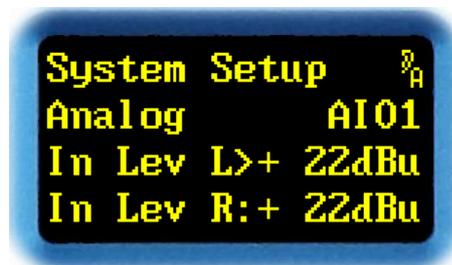


Fig. 211

Wheel →	Modify level
Wheel ←	Modify level
Exit	Discard and restore previous value
Enter	Confirm new value
Toggle	Select channel

With → or ← the analog input level can be adjusted from **0dBu** to **22dBu** in steps of 1 dB. The adjustment is either for each input separately, or jointly for both. Merely the levels where > is visible will be changed.

EXIT discards the modified value, and restores the previously-stored value.

ENTER confirms the selected value.

TOGGLE chooses what channel the change will be put on: L, R, or both.

New 4.0 Analog Output Level

This menu item exists for a **2493** only. Here, you can configure the *nominal level* of the *analog outputs*.

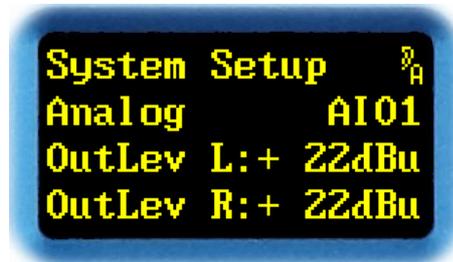


Fig. 212

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Configure output level
Toggle	Jump to Hotkey Menu

Hitting **ENTER** replaces the colon with a prompt.

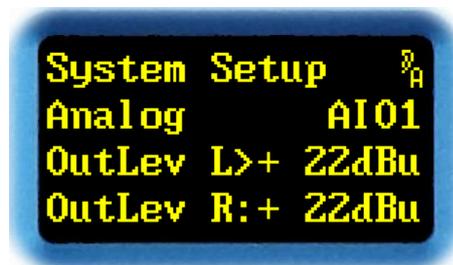


Fig. 213

Wheel →	Modify level
Wheel ←	Modify level
Exit	Discard and restore previous value
Enter	Confirm new value
Toggle	Select channel

With → or ← the analog output level can be adjusted from **0dBu** to **22dBu** in steps of 1 dB. The adjustment is either for each output separately, or jointly for both. Merely the levels where > is visible will be changed.

EXIT discards the modified value, and restores the previously-stored value.

ENTER confirms the selected value.

TOGGLE chooses what channel the change will be put on: L, R, or both.

Analog Config Features

New
4.2

This menu item exists for a **2493** only. Here, *specific features* of the *analog modules* can be configured.

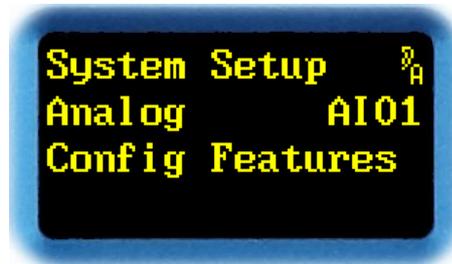


Fig. 214

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Select feature
Toggle	Jump to Hotkey Menu

Hit **ENTER** to reach the selection of features.

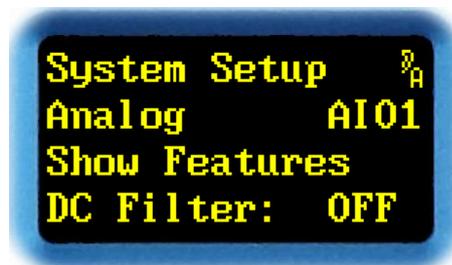


Fig. 215

Wheel →	Select feature
Wheel ←	Select feature
Exit	Back
Enter	Confirm selection
Toggle	Jump to Hotkey Menu

With → or ← one of the features can be selected. What kind of features may appear depends on the analog modules used, and may be different from device to device. With no specific features for a module, the display shows: **No Features**.

EXIT discards the selection.

ENTER confirms the selected value. The value can now be changed with → or ←, discarded with **EXIT**, or confirmed with **ENTER**.

New 4.0 Analog Show Status Info

This menu item exists for a **2493** only. Here, *specific status information* of the *analog modules* can be shown.

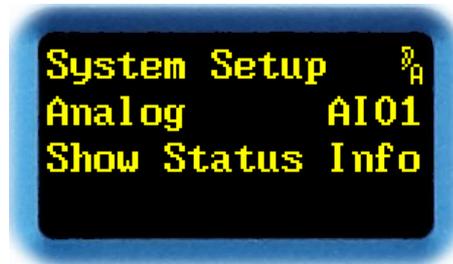


Fig. 216

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Select status information
Toggle	Jump to Hotkey Menu

Hit **ENTER** to reach the selection of status information.

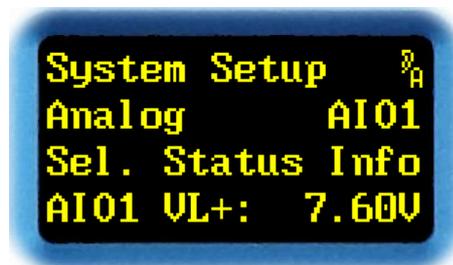


Fig. 217

Wheel →	Select status information
Wheel ←	Select status information
Exit	Back
Enter	Back
Toggle	Jump to Hotkey Menu

With → or ← status information items can be selected. What kind of information may appear depends on the analog modules used, and may be different from device to device. With no specific status information for a module, the display shows: **No Status Info**

Antialiasing Filter

New
4.0

This menu item exists for a **2493** only. Here, the currently selected *antialiasing filter for A/D and D/A converters* (see p. 70) is displayed. For plug-ins that use a sample rate of 48 kHz, the filter is selectable. For plug-ins running at 96 kHz and 192 kHz, filters are fixed. Therefore, the value is possible grayed out and accompanied by **(fix)**.



Fig. 218

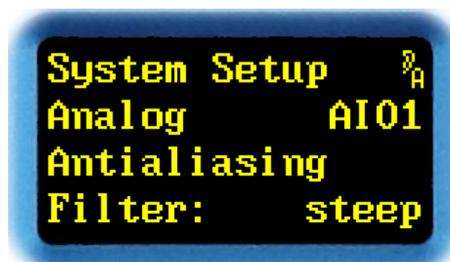


Fig. 219

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Select status information
Toggle	Jump to Hotkey Menu

For adjustable filters only, hitting **ENTER** replaces the colon with a prompt.

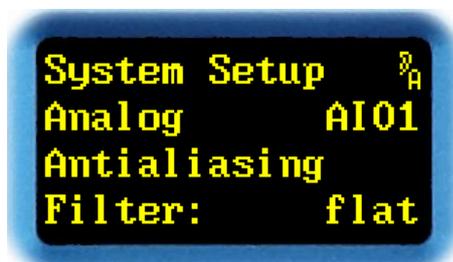


Fig. 220

Wheel →	Select filter
Wheel ←	Select filter
Exit	Discard and restore previous value
Enter	Confirm new value
Toggle	Jump to Hotkey Menu

With → or ← the filter can be switched between **steep** (*»QUANTEC in-house standard«*) and **flat** (*»problematic industry standard«*), last but not least for A/B comparisons in *Bypass* mode. More details with specific diagrams on pp. 70.

EXIT discards the modified value, and restores the previously-stored value.

ENTER confirms the selected value.

Note: See [FAQ 058](#) for a lot more about this subject.

MIDI Channel

This menu item is used to select the *MIDI Channel*.



Fig. 221

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Modify the MIDI channel
Toggle	Jump to Hotkey Menu

Hitting *ENTER* will open a prompt adjacent to the *MIDI channel* to be edited.



Fig. 222

Wheel →	Increment MIDI channel
Wheel ←	Decrement MIDI channel
Exit	Discard selection
Enter	Confirm new value
Toggle	Jump to Hotkey Menu

Rotating → and ← scrolls through MIDI channel values from 01 to 16.

EXIT discards the modified value, and restores the previously-stored value.

ENTER confirms the selected value.

TOGGLE jumps to **Hotkey Menu**.

Note: Details about MIDI control and the YARDSTICK MIDI implementation are documented in the *249x MIDI Interface* document; available for download at www.quantec.com?dl_manuals.

MIDI Device ID

This menu item is used to select *MIDI Device ID*. A MIDI Device ID is required for routing *System Exclusive messages* to a dedicated unit.



Fig. 223

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Modify the MIDI Device ID
Toggle	Jump to Hotkey Menu

Hitting *ENTER* will open a prompt adjacent to the *MIDI Device ID* for editing.



Fig. 224

Wheel →	Increment MIDI Device ID
Wheel ←	Decrement MIDI Device ID
Exit	Discard selection
Enter	Confirm new value
Toggle	Jump to Hotkey Menu

Rotating → and ← scrolls through MIDI Device IDs from 000 to 127. With the 000 setting, all *System Exclusive messages* will be accepted. Bottom row displays the ID in hexadecimal representation (\$00).

EXIT discards the modified value, and restores the previously-stored value.

ENTER confirms the selected value.

Note: Details about MIDI control and the YARDSTICK MIDI implementation are documented in the *249x MIDI Interface* document; available for download at www.quantec.com?dl_manuals.

Note On Table

This menu item edits the *Note On Table*. With this table, a *Note Number* can be assigned to a sound effect parameter. A *Note Number* is being used in *Note On Messages*.

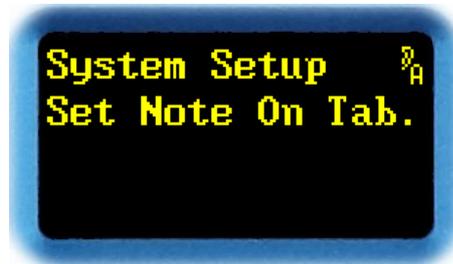


Fig. 225

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Select parameter
Toggle	Jump to Hotkey Menu

Hitting *ENTER* associates a *Note On* message to a selected plug-in parameter.

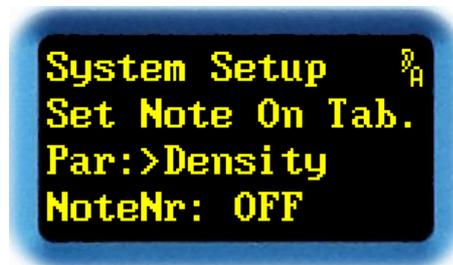


Fig. 226

Wheel →	Next parameter
Wheel ←	Previous parameter
Exit	Discard and restore previous value
Enter	Select this parameter and edit the note number
Toggle	Jump to Hotkey Menu

Rotating → or ← scrolls through the parameters list. These parameters are discussed on pp. 23.

Following the parameter name is its associated *note number*. It determines the *Note On Message* that parameter responds to.

TOGGLE jumps to **Hotkey Menu**.

Hitting **ENTER** opens a prompt adjacent to the *note number* to be edited.

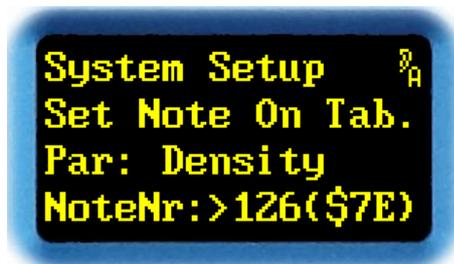


Fig. 227

Wheel →	Increase note number
Wheel ←	Decrease note number
Exit	Discard change in note number
Enter	Confirm note number
Toggle	Jump to Hotkey Menu

Rotating → and ← scrolls through the *note numbers* with values from **001 (\$00)** to **127 (\$7F)** – in addition to ignore *Note On* messages altogether (**OFF**). It goes without saying that *one note number* cannot be assigned to *more than one* parameter.

EXIT discards the modified value, and restores the previously-stored value.

ENTER confirms the selected value.

TOGGLE jumps to **Hotkey Menu**.

Note: Details about MIDI control and the YARDSTICK MIDI implementation are documented in the *249x MIDI Interface* document; available for download at www.quantec.com?dl_manuals.

New 4.0 MIDI Error Count

In the context of this menu item, various *MIDI error counters* are displayed. Based thereon, the cause of problems with MIDI control can be tracked.

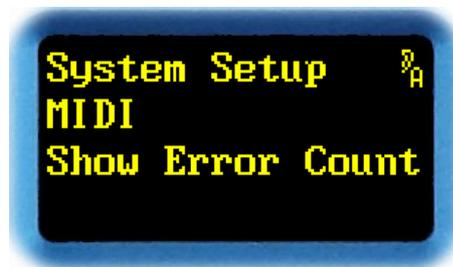


Fig. 228

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Select MIDI error counter
Toggle	Jump to Hotkey Menu

Hit **ENTER** to select one of the MIDI error counters.



Fig. 229

Wheel →	Select MIDI error counter
Wheel ←	Select MIDI error counter
Exit	Back
Enter	Back
Toggle	Clear MIDI error counter

With → or ← an error counter can be selected.

EXIT or **ENTER** discards the selection.

TOGGLE clears the error counter selected.

Note: Details about MIDI control and the YARDSTICK MIDI implementation are documented in the *249x MIDI Interface* document; available for download at www.quantec.com?dl_manuals.

These are the MIDI error counters available:

Rx Buffer overflow	The receive buffer for MIDI data has overflowed. Data arrives faster than the 249x can handle it. Before backlogged data will be overwritten, reception is stopped. The data packet received incompletely will be discarded.
Device ID does not match	If an ID unequal 0 has been set in the MIDI Device ID menu item (see p. 177), it will be compared with the Device ID (byte no. 6) of an incoming SysEx message. If the IDs do not match, an error will be flagged, and the message discarded.
Plug-in ID does not match	The plug-in ID (byte no. 8) of a SysEx message is compared to the ID of the current plug-in. If the IDs do not match, an error will be flagged, and the message discarded. The ID for plug-ins of type QRS is 043h.
Checksum does not match	In a SysEx message with command ID <i>Dump Preset</i> or <i>Dump Scratch</i> , the sum of digits across data bytes and checksum (byte no. 13..164 or rather 15..169) is calculated. The lower 7 bits of the sum of digits must all be 0, otherwise an error will be flagged, and the message discarded.
MIDI version does not match	The MIDI version of every SysEx message is checked. Excessively old versions are incompatible and will flag an error. The message will be discarded. Old incompatible versions have a number less than 030h on byte no. 7.
Preset version does not match	The version of the Preset data (byte no. 11) of every SysEx message is checked. If incompatible, an error will be flagged, and the message discarded.
Unknown Command ID	The command ID (byte no. 12) of a SysEx message is not known. An error will be flagged, and the message discarded.

Whenever an error counter is triggered, a text box on the Overview Display will pop-up with an error message stating **MIDI ERROR** or **MIDI SYSEX**:



Fig. 230

Show MIDI Version

With this menu item, the *current MIDI version* will be displayed.



Fig. 231

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Not assigned
Toggle	Jump to Hotkey Menu

The MIDI version is an integral part of SysEx messages.

TOGGLE jumps to **Hotkey Menu**.

Note: Details about MIDI control and the YARDSTICK MIDI implementation are documented in the *249x MIDI Interface* document; available for download at www.quantec.com?dl_manuals.

Real Time Clock

With this menu item, a *Real Time Clock* can be *shown* and *set*.

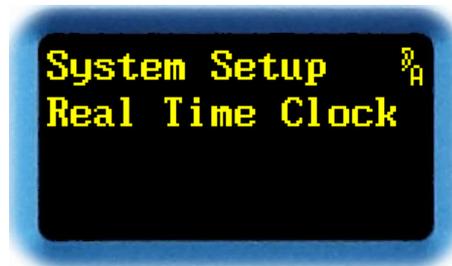


Fig. 232

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Show RTC
Toggle	Jump to Hotkey Menu

Hit **ENTER** to display current time and date of the RTC.

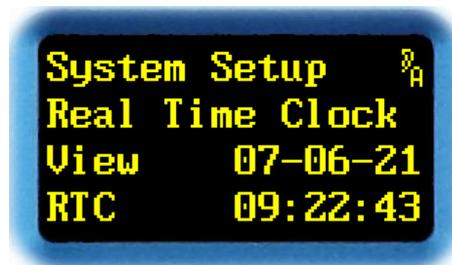


Fig. 233

Wheel →	Not assigned
Wheel ←	Not assigned
Exit	Leave this display
Enter	Set RTC
Toggle	Jump to Hotkey Menu

Current date and time will be displayed in ISO format (**YY-MM-DD HH:MM:SS**).

TOGGLE jumps to **Hotkey Menu**.

ENTER will open a prompt. Now date and time can be set.

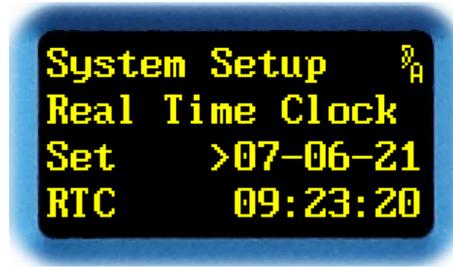


Fig. 234

Wheel →	Change value
Wheel ←	Change value
Exit	Discard date/time
Enter	Save date/time
Toggle	Jump to next value

Rotating → and ← changes the values for year, month, day, hour, minute and second. The value to be changed is being flagged by a > prompt.

EXIT discards the modified value, and restores the previously-stored value.

ENTER confirms the selected value, and updates the RTC.

TOGGLE moves the prompt > to the next position.

Note: Basically set the clock to local standard time. The changeover from winter to summer time and vice versa can be configured in the **Daylight Saving Time** menu item (see p. 188)

Note: The RTC is used for timestamps of Presets. To avoid confusion in the Preset management, periodic monitoring of the clock is recommended – or, as an alternative, configuring a time server (»NTP«) in the **Time Server** menu item (see p. 193), and a local time zone in the **Time Zone** menu item (see p. 187).

Time Server



This menu item has been introduced with version 4.0.

With this menu item, the IP address of a time server for disciplining the internal Real Time Clock is displayed and set. The IP address is displayed as 4 octets in decimal notation.



Fig. 235

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Set IP
Toggle	Jump to Hotkey Menu

In the lowest row, the status of the time server is being displayed:

Enter IP!	No IP available. The RTC runs on its local crystal clock, and is not being disciplined by a master.
Locked	The connection to the time server has been successfully established. Every hour, a new connection to the time server will be initiated, in order to discipline the RTC.
Pending	The 249X is waiting for response from the time server. Connection attempts are initiated every 20 to 30 seconds.

Note: **Pending** may also mean that the time server is accessible, but its timestamp seems to be unreliable. The 249x evaluates reliability from the NTP protocol *'stratum'* information.

Note: In addition, the **Pending** state is also indicated by a red-flashing **ETH** LED. This is also true outside this menu context. The **ETH** LED flashes more often than the repetition rate of the connection attempts, so you can verify the status of **Pending** more clearly. Moreover, an error message in the overview display appears at extended intervals.

Hitting **ENTER** replaces the 3rd row colon with a prompt:



Fig. 236

Wheel →	Change value
Wheel ←	Change value
Exit	Discard and restore previous value
Enter	Confirm value
Toggle	Move cursor to the right

Rotating → and ← increments or decrements the underlined digit. Note that each three-digit-group has a range of 000 to 255. To make setup easy, octet digits may be adjusted one by one. Controlled by the cursor _ position, an octet's value may be modified in steps of 1, 10, or 100.

EXIT discards the values entered, and restores the previously-stored values.

ENTER confirms the new value. Now it's finally the moment, where connection attempts with the newly-entered IP are being initiated.

TOGGLE moves the cursor to the right. Moving beyond the rightmost position returns the cursor to the first position.

Note: A Time Server IP address is always entered manually. An automatic entry with DHCP is currently not supported.

Note: If a time server is used for synchronization, the local time zone (see **Time Zone** menu item on p. 187) must be set as well.

Time Zone

New
4.0

This menu item has been introduced with version 4.0. Here, the *local time zone* can be specified. Based on time zone and time server, the internal Real Time Clock can be set and tracked (»disciplined«) automatically. Time zone is defined by its deviation from UTC (»Universal Time Coordinated«).



Fig. 237

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Set IP
Toggle	Jump to Hotkey Menu

Hit **ENTER** replaces the colon with a prompt.

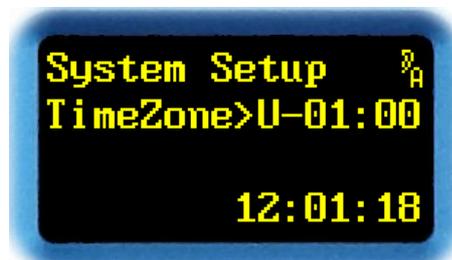


Fig. 238

Wheel →	Change value
Wheel ←	Change value
Exit	Discard and restore previous value
Enter	Confirm value
Toggle	Jump to Hotkey Menu

Rotating → and ← changes time zone in steps of 15 minutes over a range of **-12:00** to **+13:00**. To facilitate setting, derived wall clock time is displayed near the bottom.

EXIT discards the values entered, and restores the previously-stored values.

ENTER confirms the new value.

Note: The local time zone is solely used in conjunction with a time server (see p. 193).

New 4.0 Daylight Saving Time

This menu item has been introduced with version 4.0. Here, the usage of daylight saving time (**DST**) (»summer time / winter time«) can be configured.



Fig. 239

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Set DST
Toggle	Jump to Hotkey Menu

Hit **ENTER** to configure daylight saving time:



Fig. 240

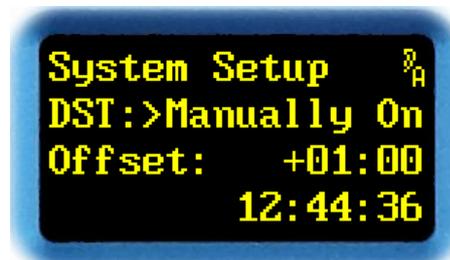


Fig. 241



Fig. 242

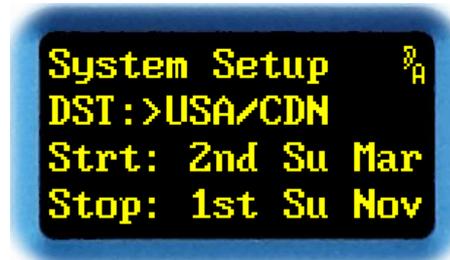


Fig. 243

Wheel →	Change value
Wheel ←	Change value
Exit	Discard and restore previous value
Enter	Confirm value
Toggle	Jump to Hotkey Menu

Rotating **→** and **←** changes DST to **OFF**, **Manually On**, **Europe**, and **USA/CND**. To facilitate setting, either wall clock time, or begin and end of DST are displayed below.

EXIT discards the values entered, and restores the previously-stored values.

ENTER confirms the new value. In the **Manually On** setting, an offset can be configured now:

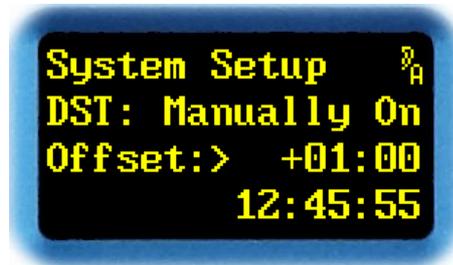


Fig. 244

Wheel →	Change value
Wheel ←	Change value
Exit	Discard and restore previous value
Enter	Confirm value
Toggle	Jump to Hotkey Menu

Rotating **→** and **←** changes the offset in steps of 15 minutes – over a range of **+00:00** to **+02:00**. To facilitate setting, derived wall clock time is displayed near the bottom.

EXIT discards the values entered, and restores the previously-stored values.

ENTER confirms the new value.

TOGGLE jumps to **Hotkey Menu**.

Note: Automatic switchover from summer time to winter time and vice versa works only, if either a time server (see p. 193) is active, or the RTC (see p. 183) is set to standard (winter) time.

Show Ethernet

This parameter has been introduced with version 3.0.

This menu item *displays the assignments* of the *Ethernet interface*. Whenever the DHCP setting in the **Configure Ethernet** chapter (more details pp. 191) has been set to **auto**, this menu item is the only way of verifying the allocated DHCP values right from the unit's front panel.



Fig. 245

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Show Ethernet assignments
Toggle	Jump to Hotkey Menu

Hitting **ENTER** jumps to the display of *IP address*, *Netmask*, and *Gateway*.

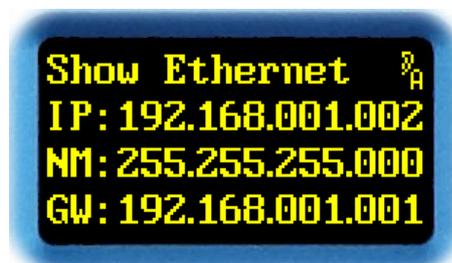


Fig. 246

Wheel →	Not assigned
Wheel ←	Not assigned
Exit	Return
Enter	Return
Toggle	Jump to Hotkey Menu

The values for *IP address*, *Netmask*, and *Gateway* are being displayed as 4 octets each in a decimal representation.

Note: If the setting is **auto**, it may take up to 1 minute after connection to the DHCP server has been established, until the IP address will be assigned.

Configure Ethernet

This menu item displays and configures the *IP configuration of the Ethernet interface*.



Fig. 247

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Configure Ethernet
Toggle	Jump to Hotkey Menu

Hitting *ENTER* will open a prompt, and the Ethernet interface can now be modified.



Fig. 248

Wheel →	Next setting
Wheel ←	Previous setting
Exit	Discard setting
Enter	Confirm setting
Toggle	Jump to Hotkey Menu

Rotating → and ← toggles between Ethernet interface settings **auto** or **man.** Selecting **auto** permits automatic configuration using the values obtained over DHCP after power-on. This requires access to a DHCP server configured appropriately. The assigned values can be read from **Show Ethernet**. Selecting **man.** allows for manual entry of IP address, Netmask, and Gateway.

EXIT discards the values entered, and resets them to the previously-stored values.

ENTER either confirms the **auto** setting, or proceeds with the manual IP address entry field.

TOGGLE jumps to **Hotkey Menu**.

IP address, Netmask, and Gateway are presented as 12 digit specifiers. A prompt adjacent to **IP**, **NW**, or **GW** indicates that the value is editable:



Fig. 249

Wheel →	Increment underlined digit
Wheel ←	Decrement underlined digit
Exit	Discard the change, and restore previously-stored value
Enter	Confirm new 12 digit value, then move to next line
Toggle	Move cursor to the right

Rotating → and ← increments or decrements the underlined digit. Note that a group of 3 digits has a range of 000 to 255. To make setup easy, octet digits may be adjusted one by one. Controlled by the cursor _ position, an octet's value may be modified in steps of 1, 10, or 100.

EXIT discards the values entered, and restores the previously-stored values.

ENTER confirms the new 12 digit value, and moves the cursor to the next line. Repeating **ENTER** advances from *IP address* to *Netmask* to *Gateway*, then returns to the **Ethernet** menu group

TOGGLE moves the cursor to the right. Moving beyond the rightmost position returns the cursor to the first position.

Note: If the setting is **auto**, it may take up to 1 minute after connection to the DHCP server has been established, until the IP address will be assigned.

Note: Please configure your DHCP server to always allocate the same IP number whenever a certain MAC address tries to connect again later.

Note: Values for *IP address*, *Netmask*, and *Gateway* are assigned by your network's system administrator.

Show MAC Address

This menu item *displays* the MAC address of the *Ethernet interface*.

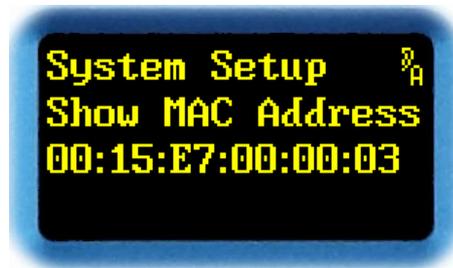


Fig. 250

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Not assigned
Toggle	Jump to Hotkey Menu

The MAC address appears on the third line in hexadecimal format. In addition, the MAC address is printed on the rear panel, adjacent to the serial number.

TOGGLE jumps to **Hotkey Menu**.

Restore Setup

This menu item *restores* the original *manufacturer configuration* for the *System Setup section*. Certain menu groups may be handled individually.

New
4.0

Since version 4.0, a clear distinction is made between *Device setup* and *Plug-in setup*.

ATTENTION! You will lose *all* settings in the selected menu group! For menu groups that belong to the *Device setup*, you will lose *all* settings in *all* plug-ins that are installed on this unit!



Fig. 251

Wheel →	Next menu item
Wheel ←	Previous menu item
Exit	Return to menu groups
Enter	Go to confirmation step
Toggle	Jump to Hotkey Menu

Hit **ENTER** to select the menu group which you want the setup to be restored to the original factory settings.



Fig. 252

Wheel →	Select next menu group
Wheel ←	Select previous menu group
Exit	Discard
Enter	Go to confirmation step
Toggle	Jump to Hotkey Menu

Rotating → and ← chooses a menu group from **System Setup**. As the **Effect**, **Preset**, and **MIDI** menu groups are located under *Plug-in setup* – only a single plug-in is affected. All other menu groups are located under *Device setup* – so *all* installed plug-ins are affected.

ENTER confirms the selection, and advances to a confirmation step.

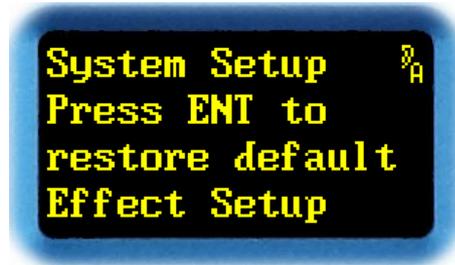


Fig. 253

Wheel →	Not assigned
Wheel ←	Not assigned
Exit	Discard
Enter	Overwrite setup configuration with factory default
Toggle	Jump to Hotkey Menu

EXIT discards the confirmation step – so *System Setup* remains unchanged.

ENTER overwrites the entire setup configuration with factory defaults. Thereafter, the following message indicates that the update has finished.



Fig. 254

Wheel →	Back to select menu item
Wheel ←	Back to select menu item
Exit	Back to select menu item
Enter	Back to select menu item
Toggle	Back to select menu item

Any further keystroke returns control back to selection of the menu items.

Load Scratch B

This main menu item handles *loading of a Preset to Scratch B*. Note that *Scratch B* is *read-only*. If parameter changes are anticipated, the read/write capable *Scratch A* should be used instead.

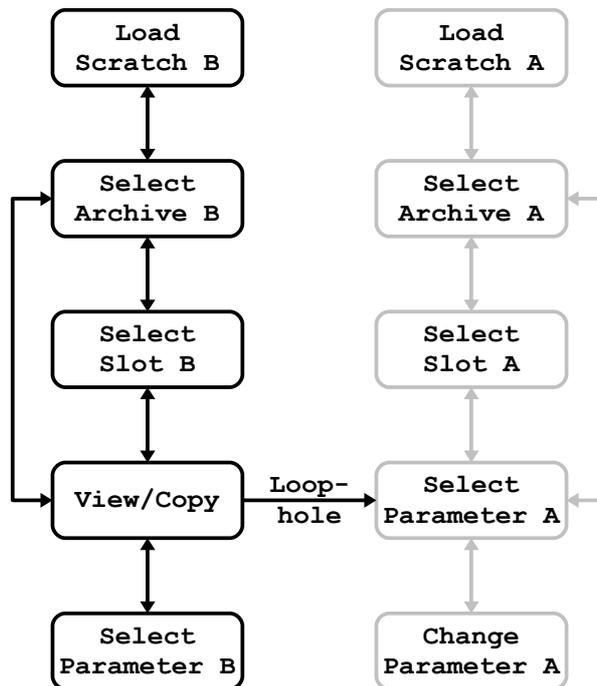


Fig. 255: Load Scratch B menu structure
(with "loophole" to Select Parameter A)

This main menu item appears as follows:



Fig. 256

Wheel →	Next main menu item
Wheel ←	Previous main menu item
Exit	Not assigned
Enter	Go to Select Archive B main menu item
Toggle	Jump to Hotkey Menu

Rotating ← and → scrolls through the main menu items.

ENTER proceeds to the **Load Scratch B** menu. First submenu item is **Select Archive B**.

TOGGLE jumps to **Hotkey Menu**.

Select Archive B

This menu item is used to *select an archive* that a *Preset* will be read from, duplicated, and eventually loaded to *Scratch B*.



Fig. 257

Wheel →	Next archive
Wheel ←	Previous archive
Exit	Return to Load Scratch B main menu item
Enter	Confirm new value
Toggle	Not assigned

Rotating → and ← scrolls through the **Music-Lib**, **Dialog-Lib**, **Bank**, **Local**, or **Scratch A** archives. The **File** archive is for display only.

Music-Lib selects an archive with *Factory Presets* for *this* plug-in (*i.e. QRS*). The archive contains Presets optimized for music, with no unpleasant or obtrusive early reflections. It is always available. For ease of operation, the Presets have been separated into classes: **SMALL Rooms**, **MEDium Rooms**, **LARge Rooms**, **CONCcert Halls**, **SACred Spaces**, **PLATes**, and **VARious**. Hitting **ENTER** once allows to select a class. Hitting **ENTER** again confirms the class, and proceeds to the **Select Slot B** submenu item.

Dialog-Lib selects an archive with *Factory Presets* for *this* plug-in (*i.e. QRS*). The archive contains lively Presets optimized for dialogs, with generously added early reflections. It is always available. For ease of operation, the Presets have been separated into classes: **CONTainers**, **VEHicles**, **SMALL Rooms**, **MEDium Rooms**, **LARge Rooms**, **BIG Rooms**, **OUTdoors**, and **VARious**. Hitting **ENTER** once allows to select a class. Hitting **ENTER** again confirms the class, and proceeds to the **Select Slot B** submenu item.

Bank taps into the **Local** archive of a plug-in located *within another bank* of the same unit. This archive appears only after having registered a valid bank within **Bank Archive (System Setup, p. 133)**. **ENTER** continues to the **Select Slot B** menu item.

Local selects the *locally-stored archive*, and is thus always available. **ENTER** continues to the **Select Slot B** menu item.

Scratch A selects Preset *Scratch A*, and is thus always available. **ENTER** continues to the **View Parameter B** menu item.

File is just a pseudo archive. It notifies the origin of the Preset, i.e. that the *Scratch B* Preset has been imported from a PC or Mac file. When turned aside, it cannot be reconstructed any more. If a parameter needs to be modified unexpectedly, hitting **ENTER** will take you down the menu to a "loophole" that, by crossing the divide to the *Scratch A* tree, allows accessing **Select Parameter A** through a backdoor.

Select Slot B

This menu item is used to *copy a Preset*, located at a preselected *archive slot*, to *Scratch B*.



Fig. 258: Select Slot B – Lib

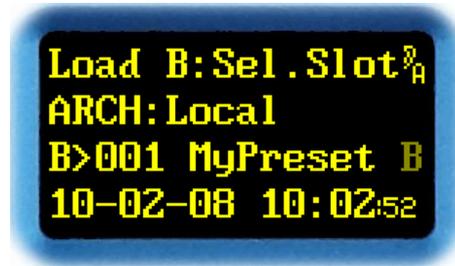


Fig. 259: Select Slot B – Local, Bank

Wheel →	Increment slot
Wheel ←	Decrement slot
Exit	Go to Select Archive B submenu item
Enter	Confirm new value
Toggle	Jump to Hotkey Menu

The second line displays the archive. Display layouts vary according to the type of archive.

For Factory Presets in *Music-Lib* and *Dialog-Lib*, the display shows on its third line – after the **B>** – a mnemonic (first three characters) of the class name (**SAC** for **SACred Spaces**), followed by the name of the Preset (**Cathedr1**).

For User Presets in *Local* and *Bank*, the display shows on its third line – after the **B>** – the slot number (**001**), followed by the name of the Preset (**MyPreset**).

The **A**, **B**, or ^A/_B symbols visualize that this Preset has already been loaded to *Scratch A* or *Scratch B*. The fourth line displays date and time of the last change to this slot. Text string **No Timestamp** appears, if a *Factory Preset* was selected, as only *User Presets* do record date and time of their most recent modifications.

Rotating → and ← scrolls through the slot numbers. Depending on the setting of **Preset Load** (p. 134) in **System Setup**, the Preset either loads immediately, or waits for **ENTER**. A loaded Preset is indicated by the presence of the **B** or ^A/_B symbols at the end of the third line.

EXIT returns to the **Select Archive B** submenu item.

ENTER confirms selection, and proceeds to the **View/Copy Preset B** submenu item, right after the Preset has finished loading.

TOGGLE jumps to **Hotkey Menu**.

View/Copy Preset B

This menu item is used to *select* whether to *copy the Scratch B Preset to Scratch A*, or to *display its parameters*.



Fig. 260: View/Copy B – Lib

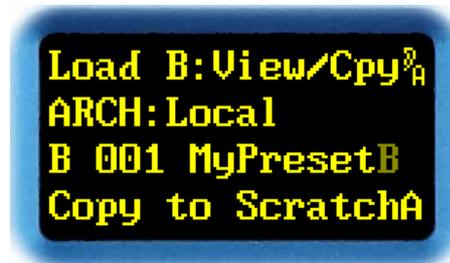


Fig. 261: View/Copy B – Local, Bank

Wheel →	Toggle between View and Copy
Wheel ←	Toggle between View and Copy
Exit	Go to Select Slot B / Select Archive B submenu item
Enter	Confirm new value
Toggle	Jump to Hotkey Menu

The second line displays the archive. The display layouts vary according to the type of archive.

For Factory Presets in *Music-Lib* and *Dialog-Lib*, the display shows on its third line – after the **B>** – a mnemonic (first three characters) of the class name (**SAC** for **SACred Spaces**), followed by the name of the Preset (**Cathedr1**).

For User Presets in *Local* and *Bank*, the display shows on its third line – after the **B>** – the slot number (**001**), followed by the name of the Preset (**MyPreset**).

The **A**, **B**, or ^A/_B symbols visualize that this Preset has already been loaded to *Scratch A* or *Scratch B*. The fourth line displays the **Copy to ScratchA** or **View Parameter** options.

Rotating **→** and **←** toggles between **Copy to ScratchA** and **View Parameter**.

Depending on the selected archive, **EXIT** returns to the **Select Slot B** or **Select Archive B** menu item.

ENTER confirms the selection. Confirming **Copy to ScratchA** copies the Preset to *Scratch A*, then proceeds to the **Select Parameter A** submenu item of the **Load Scratch A** main menu item. Confirming **View Parameter** proceeds to the **View Parameter B** submenu item.

TOGGLE jumps to **Hotkey Menu**.

View Parameter B

This menu item is used to *view Scratch B parameters*.



Fig. 262

Wheel →	Next parameter
Wheel ←	Previous parameter
Exit	Select View/Copy Preset B menu item
Enter	Select View/Copy Preset B menu item
Toggle	Jump to Hotkey Menu

The second row shows the loaded Preset's archive (**Local**) and Preset name (**Backyard**). The third and fourth rows display the *selected parameter's* name, numerical value, and bargraph value. Since *Scratch B* parameters are read-only, they have been grayed out.

Rotating → and ← scrolls through the parameter list. The order of the parameter list can be modified using the **Menu Parameter Line Up** menu item (p. 138) under the **System Setup** main menu.

EXIT or **ENTER** return to menu item **View/Copy Preset B**.

TOGGLE jumps to **Hotkey Menu**.

Note: The appearance of the parameters may be configured under the **Parameter Display Type** menu item in the **System Setup** main menu. More about this on p. 142.

Load Scratch A

This main menu item handles *copying/loading of a Preset to Scratch A*.

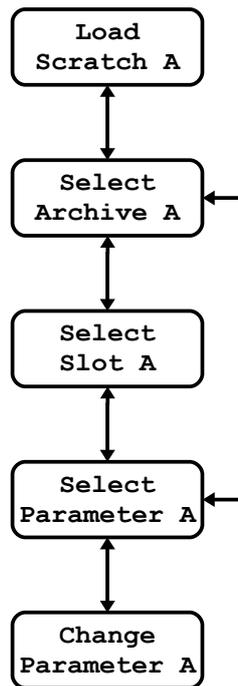


Fig. 263: Load Scratch A menu structure

This main menu item appears as follows:



Fig. 264

Wheel	→	Next main menu item
Wheel	←	Previous main menu item
Exit		Not assigned
Enter		Go to Select Archive A submenu item
Toggle		Jump to Hotkey Menu

Rotating **←** and **→** scrolls through the main menu items.

ENTER proceeds to the **Load Scratch A** menu. First submenu item is **Select Archive A**.

TOGGLE jumps to **Hotkey Menu**.

Select Archive A

This menu item is used to *select an archive* that a *Preset* will be read from, duplicated, and eventually loaded to *Scratch A*.



Fig. 265

Wheel →	Next archive
Wheel ←	Previous archive
Exit	Return to Load Scratch A main menu item
Enter	Confirm new value
Toggle	Not assigned

Rotating → and ← scrolls through the **Music-Lib**, **Dialog-Lib**, **Bank**, **Local**, or **Scratch B** archives. Both the **File** and **MIDI** archives are for display only.

Music-Lib selects an archive with *Factory Presets* for *this* plug-in (*i.e. QRS*). The archive contains Presets optimized for music, with no unpleasant or obtrusive early reflections. It is always available. For ease of operation, the Presets have been separated into classes: **SMALL Rooms**, **MEDium Rooms**, **LARge Rooms**, **CONCcert Halls**, **SACred Spaces**, **PLATes**, and **VARious**. Hitting **ENTER** once allows to select a class. Hitting **ENTER** again confirms the class, and proceeds to the **Select Slot A** submenu item.

Dialog-Lib selects an archive with *Factory Presets* for *this* plug-in (*i.e. QRS*). The archive contains lively Presets optimized for dialogs, with generously added early reflections. It is always available. For ease of operation, the Presets have been separated into classes: **CONTainers**, **VEHicles**, **SMALL Rooms**, **MEDium Rooms**, **LARge Rooms**, **BIG Rooms**, **OUTdoors**, and **VARious**. Hitting **ENTER** once allows to select a class. Hitting **ENTER** again confirms the class, and proceeds to the **Select Slot A** submenu item.

Bank taps into the **Local** archive of a plug-in located *within another bank* of the same unit. This archive appears only after having registered a valid bank within **Bank Archive (System Setup, p. 133)**. **ENTER** continues to the **Select Slot A** menu item.

Local selects the *locally-stored archive*, and is thus always available. **ENTER** continues to the **Select Slot A** menu item.

Scratch B selects Preset *Scratch B*, and is thus always available. **ENTER** continues to the **Select Parameter A** menu item.

File is just a pseudo archive. It notifies the origin of the Preset, i.e. that the *Scratch A* Preset has been imported from a PC or Mac file. When turned aside, it cannot be reconstructed any more. If a parameter needs to be modified, hitting **ENTER** will take you down the menu to open **Select Parameter A**.

MIDI is just a pseudo archive. It notifies the origin of the Preset, i.e. that the *Scratch A* Preset has been coined from a Scratch dump through the MIDI port. When turned aside, it cannot be reconstructed any more. If a parameter needs to be modified, hitting **ENTER** will take you down the menu to open **Select Parameter A**.

Select Slot A

This menu item is used to *copy a Preset*, located at a preselected *archive slot*, to *Scratch A*.



Fig. 266: Select Slot A – Lib

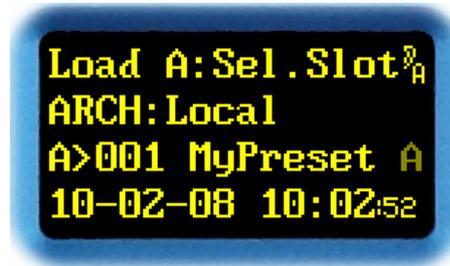


Fig. 267: Select Slot A – Local, Bank

Wheel →	Increment slot
Wheel ←	Decrement slot
Exit	Go to Select Archive A submenu item
Enter	Confirm new value
Toggle	Jump to Hotkey Menu

The second line displays the archive. Display layouts vary according to the type of archive.

For Factory Presets in *Music-Lib* and *Dialog-Lib*, the display shows on its third line – after the **A>** – a mnemonic (first three characters) of the class name (**SAC** for **SACred Spaces**), followed by the name of the Preset (**Cathedr1**).

For User Presets in *Local* and *Bank*, the display shows on its third line – after the **A>** – the slot number (**001**), followed by the name of the Preset (**MyPreset**)

The **A**, **B**, or **A/B** symbols visualize that this Preset has already been loaded to *Scratch A* or *Scratch B*. The fourth line displays date and time of the last change to this slot. Text string **No Timestamp** appears, if a *Factory Preset* was selected, as only *User Presets* do record date and time of their most recent modifications.

Rotating **→** and **←** scrolls through the slot numbers. Depending on the setting of **Preset Load** (p. 134) in **System Setup**, the Preset either loads immediately, or waits for **ENTER**. A loaded Preset is indicated by the presence of the **A** or **A/B** symbols at the end of the third line.

EXIT returns to the **Select Archive A** submenu item.

ENTER confirms selection, and proceeds to the **Select Parameter A** submenu item, right after the Preset has finished loading.

TOGGLE jumps to **Hotkey Menu**.

Select Parameter A

This menu item is used to *inspect Scratch A parameters*.

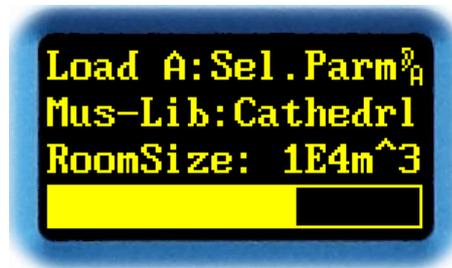


Fig. 268

Wheel →	Next parameter
Wheel ←	Previous parameter
Exit	Go to Select Slot A / Select Archive A menu item
Enter	Select this parameter, then go to menu item Change Parameter A
Toggle	Jump to Hotkey Menu

The second row shows the loaded Preset's archive (**Local**) and Preset name (**Backyard**). The third and fourth rows display the *selected parameter's* name, numerical value, and bargraph value.

Rotating → and ← scrolls through the parameter list. The order of the parameter list can be modified using the **Menu Parameter Line Up** menu item (p. 138) under the **System Setup** main menu.

Depending on the selected archive, **EXIT** returns to the **Select Slot A** or **Select Archive A** menu item.

ENTER continues to the **Change Parameter A** menu item.

TOGGLE jumps to **Hotkey Menu**.

Note: The appearance of the parameters may be configured under the **Parameter Display Type** menu item in the **System Setup** main menu. More about this on p. 142.

Change Parameter A

This menu item is used to *modify a selected Scratch A parameter*.

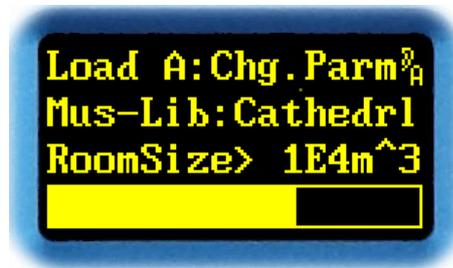


Fig. 269

Wheel →	Increment parameter value
Wheel ←	Decrement parameter value
Exit	Discard parameter change
Enter	Confirm parameter value
Toggle	Jump to Hotkey Menu

The second row shows the loaded Preset's archive (**Local**) and name (**Backyard**). The third and fourth rows display the *selected parameter's* name, numerical value, and bargraph value.

Rotating → and ← scrolls through the parameter values. The entire set of parameters is listed on pp. 23.

EXIT discards any parameter change. The old value will be restored, and the **Select Parameter A** menu item reopened.

ENTER confirms the new value, and again, the **Select Parameter A** menu item will be reopened.

TOGGLE jumps to **Hotkey Menu**.

Note: The appearance of the parameters may be configured under the **Parameter Display Type** menu item in the **System Setup** main menu. More about this on p. 142.

Save Scratch A

This menu item is used to *store Scratch A Preset* to a memory slot chosen from an archive location.

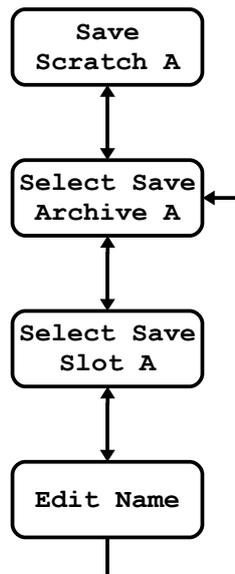


Fig. 270: Save Scratch A menu structure

This main menu item appears as follows:



Fig. 271

Wheel →	Next main menu item
Wheel ←	Previous main menu item
Exit	Not assigned
Enter	Go to Select Save Archive A submenu item
Toggle	Jump to Hotkey Menu

Rotating → and ← scrolls through the main menu items.

ENTER selects the **Save Scratch A** menu. First submenu item is **Select Save Archive A**.

TOGGLE jumps to **Hotkey Menu**.

Select Save Archive A

This menu item *selects the archive* that the *Preset located in Scratch A* will be stored to, and eventually archived there.



Fig. 272

Wheel →	Next archive
Wheel ←	Previous archive
Exit	Return to Save Scratch A menu item
Enter	Confirm new value
Toggle	Not assigned

Rotating → and ← scrolls through the *archive* options: **Local** or **Scratch B**.

Local selects the *locally-stored archive*, and is thus always available. **ENTER** continues with the **Select Save Slot A** submenu item.

Scratch B selects the *Scratch B Preset*, and is thus always available. **ENTER** copies the Preset to *Scratch B*, then returns to the **Save Scratch A** main menu item.

EXIT returns to the **Save Scratch A** main menu item.

Select Save Slot A

This menu item *selects the archive memory slot* that the *Preset located in Scratch A* will eventually be stored to.



Fig. 273

Wheel →	Select slot
Wheel ←	Select slot
Exit	Go to Select Save Archive A submenu item
Enter	Confirm new value
Toggle	Jump to Hotkey Menu

The second line displays the archive, and the third line – after the **A>** – slot number (**001**) and name (**Backyard**) of the Preset. The **A**, **B**, or ^A/_B symbols visualize that this Preset has already been loaded to *Scratch A* or *Scratch B*. The fourth line displays date and time of the last change to this slot. Text string **No Timestamp** appears, if a *Factory Preset* was selected, as only *User Presets* do record date and time of their most recent modifications.

Rotating → and ← scrolls through the slot numbers.

EXIT returns to the **Select Save Slot A** menu item without saving.

ENTER confirms the slot number, and continues with the **Edit Name** submenu item. Note that the Preset has not been stored yet, as the Preset name will need to be updated first.

TOGGLE jumps to **Hotkey Menu**.

Edit Name

This menu item is used to *label a Preset* that should be stored to a slot, using a text string of up to 8 characters.



Fig. 274

Wheel →	Next ASCII character
Wheel ←	Previous ASCII character
Exit	Return to menu item Select Save Slot A
Enter	Confirm new value
Toggle	Move cursor to the right

The second line displays the archive, and the third line – after the **A>** – slot number (**001**) and name (**Backyard**) of the Preset. The symbols **A**, **B**, or ^A/_B visualize that this Preset has already been loaded to *Scratch A* or *Scratch B*. The fourth line displays date and time of the last change to this slot. Text string **No Timestamp** appears, if a *Factory Preset* was selected, as only *User Presets* do record date and time of their most recent modifications.

Rotating → and ← scrolls through the ASCII character table for the underlined character position. The ASCII characters include capitals, numerical, and symbolic characters.

EXIT returns to the **Select Save Slot A** menu item without saving.

ENTER stores the named Preset to the selected slot, and returns to the **Select Save Archive A** submenu item.

TOGGLE advances the cursor to the next character. Moving right beyond the rightmost character puts the cursor back to start of text string.

Plug-in Boot Loader

The YARDSTICK 249x series is able to maintain *multiple effect plug-ins* within a *single* unit. Depending on the device type, there are 15 or 63 banks available. A plug-in generally requires *one* bank. Complex plug-ins with substantial amounts of code, or plug-ins with extraordinary large Preset libraries, may occasionally be *stretched over several banks*, e.g. a convolver-type reverb with an extensive library of room fingerprint samples.

Plug-ins are managed by a dedicated software: a plug-in boot loader called SWITCH. It has been optimized for plug-ins of software version 2.0 and above. To complement an installation of *different* plug-ins, SWITCH may also be used to install *a newer version* of the **same plug-in** in a *separate* bank. This enables a risk-free test bed, as each bank supplies an individual sandbox for the Presets, and thus avoids accidental altering or damaging of an existing Preset collection.

Older versions, 1.x by name, cannot be bundled without some restrictions, as various specifications cannot be accessed. A comprehensive plug-in name, a software version, and a device type are all missing. Occasionally, conflicts may arise with device drivers not downward compatible, as old software may operate with the old driver only, and new software with the new one.

Traditionally, previous 1.x software may be installed solely in the boot bank 0; which is exactly the place claimed by SWITCH. Before overwriting bank 0 with its own installation, SWITCH searches for a previous 1.x effect there, and offers relocating it (including all Presets) to a rearward bank from 1 to 15 (or 63). Not before that relocation has been successfully finalized, SWITCH asks for confirmation to start its own installation. If denied, a new installation of other 1.x software could be dumped to bank 0, which, once again, will be relocated with the next SWITCH installation attempt. By repeatedly using this trick, multiple banks could be equipped with e.g. versions 1.6, 1.7, and 1.8, including Presets. Besides the 2.x and newer plug-ins, all those historic versions would be available for immediate selection and startup, too.

A useful idea might be to create numerous *virtual effect units* for your entire staff. With a multiple installation of the same plug-in within a single unit, each sound engineer may be assigned an individual bank on that unit. When returning to the studio after hours or weeks, an engineer will find *his* unit with an exact snapshot of the settings from the moment he has left it. This holds true for even the tiniest details: position within the menu tree, status of the Mute buttons, and even *temporary parameter changes*, not yet written back to Scratch or to the library, will reappear like magic.

Additional information on SWITCH can be found in [FAQ 014](#) and [FAQ 015](#).

Starting with version 2.3, a new **Bank** archive has been introduced. This enables read-only access to User Presets (**Local**) from *other* banks. To protect the external archives, write access to foreign banks is disabled. If such a „*tapped*“ Preset has been altered, it can only be saved to the **Local** archive of the *own* bank.

This allows for two interesting strategies: on the one hand, potentially precious Preset collections from older installations can still be used after one or more software updates. On the other hand, a system operator may establish a *facility-wide public Preset archive* on a specially rededicated bank. To collect Presets from his users, the sys-op temporarily mounts the various users' **Local** banks onto his own **Bank** archive, then copies *generally useful* Presets to his **Local** archive, which in turn will later be referenced by his cohorts..

Information on how to register a bank for mounting can be found under **Bank Archive** (p. 133).

Additional information on how to access Presets from a foreign bank can be found at [FAQ 017](#) and [FAQ 018](#).

Auto Boot

During power-up, SWITCH scans all banks sequentially for installed plug-ins, then automatically initializes the most-recent plug-in used. For a short time, the following message will be flashed to the display:

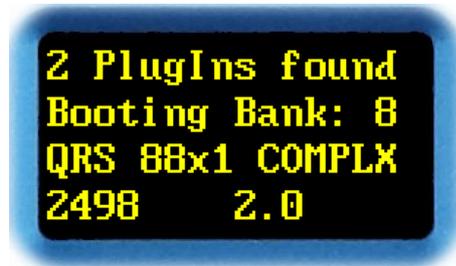


Fig. 275

The first line shows the number of plug-ins installed in this unit. The second line shows the bank number, where a previously configured power-on plug-in will be loaded from. The lower two lines output plug-in identifier, device type, and plug-in version number.

Note: For older versions 1.x, no more than **QRS**, **249x**, and **1.x** is being listed here.

Manual Boot

A manual boot can be enforced by switching-on the unit while pressing both **ENT** and **XIT** keys, up to the moment the first display message pops up.

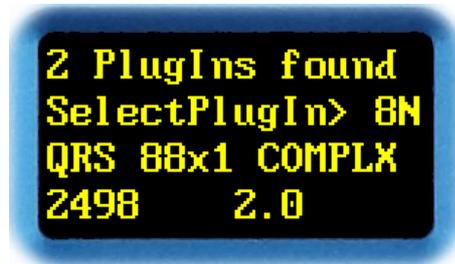


Fig. 276

Wheel →	Next bank
Wheel ←	Previous bank
Exit	Discard selection
Enter	Confirm new selection
Toggle	Not assigned

First line shows the number of plug-ins installed in this unit. Second line shows the bank number where the plug-in will be loaded from. A trailing **N** signalizes a *newly-installed* plug-in not yet launched since its installation. The lower two lines output plug-in identifier, device type, and plug-in version number.

Turning → and ← selects a bank. Only banks with an installed plug-in will be shown, so empty banks will cause gaps in the numbering sequence.

EXIT discards a selection. The most-recent plug-in will be loaded again.

ENTER confirms a selection. The selected bank will be preassigned for future auto boots, and the plug-in from that bank will be initialized.

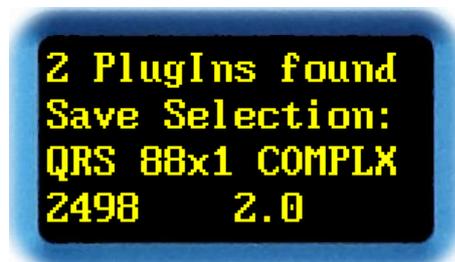


Fig. 277

Note: Whenever a new plug-in has been installed, a **Manual Boot** will be enforced. The most-recent plug-in will remain default. If required, the new one with the N needs to be formally selected.

Note: Plug-ins or occupied banks may be erased via *web browser* (see p. 94) or the *installation tool* (EXE file) at any time. For safety reasons, clearing a bank from the device's front panel menu is not possible.

Error Messages

Following power-up, all banks will be scanned for installed plug-ins. If no plug-in can be detected, the device halts with the following message:



Fig. 278

Causes: Either all the banks have been erased completely, or SWITCH has been installed on a device where only software of version 1.x has been installed previously, which has been overwritten instead of relocated – as recommended.

Solution: Install a plug-in with software version 2.x or higher, then reboot the unit.

Finally, there is a test whether the auto boot plug-in is still available in the bank assigned for power-up. If that test fails, a **Manual Boot** will be enforced with a modified header line.

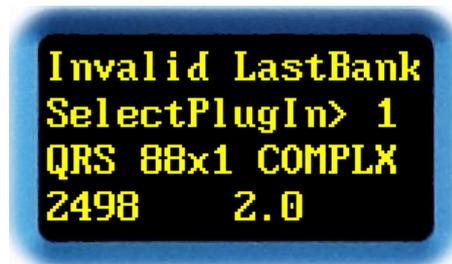


Fig. 279

Causes: The plug-in from the preassigned auto boot bank has been erased. An installation on top of the preassigned bank has been prematurely aborted. After an update of SWITCH software, all preassigned information will purposely be lost.

Solution: First try to reinstall the damaged plug-in to the preassigned bank. Watch for potential aborts and verify that the plug-in is being installed up to the end. In the last resort, simply turn the wheel and select a different bank.

Common Pitfalls

Problem: Whenever I double or quadruple input sample rate, RT60 scales by $\frac{1}{2}$ or $\frac{1}{4}$.

Cause: Your YARDSTICK doesn't recognize the input sample rate properly.

Solutions:

1. Verify the Channel Status bits of your mixing console's "effect send" path, and fix them as necessary.
2. If only one style of sample rates being used in the studio: go to the YARDSTICK's **System Setup Sample Rate Reference** and force **FIX 44.1** or **FIX 48**; x1, x2, or x4 multipliers will be recognized automatically.
3. If all styles of sample rates are being used in the studio: go to the YARDSTICK's **System Setup Sample Rate Reference** and select **Measure**.

More info: See **Sample Rate Reference** (p. 36 and p. 164).

CAUTION! Measuring frequency may be ambiguous due to overlap of the varispeed sidebands.

Problem: I absolutely cannot agree with the chorus who is praising the sound of the QRS algorithm in such rhapsodic manner. With my YARDSTICK, particularly female voices sound unpleasant and discolored, just as the entire signal has been fed through a comb filter or flanger. Even changing room size or RT60 does help precious little.

Cause: The direct path may exist twice: through the YARDSTICK, and through the mixing console.

Solutions:

1. Disable the direct path in your console.
2. Go to **System Setup Direct Path Enable** and disable the direct path in your YARDSTICK.
3. If available, hit the mini pushbutton *Mute Dry* (lights up red).
4. Hit **TOGGLE** and enter the **Hotkey Menu**. Look for **Mute Dry** and enable it.

More info: See **Mute Keys** (p. 50), **Mute Dry** (p. 99) and **Direct Path Enable** (p. 123).

- Problem:** **The YARDSTICK seems to process the input clock erroneously. The Lock LED flashes irregularly, and occasionally I even hear clicks and gaps.**
- Cause:** The AES3 input level is too low, or enters the unit as unbalanced signal.
- Background:** All QUANTEC devices provide much higher common-mode rejection ratio (CMRR) than usual. EFT bursts of up to 1kV on the AES3 inputs and outputs are being absorbed without any audible clicks. But if the driver is unbalanced, e.g. a grounded S/PDIF output, the audio frame signal will be suppressed more or less, too. Even if your sound card's operations guide promises a ground-**lifted** output, this states by no means that this output is also ground-**balanced**. S/PDIF outputs generally provide a capacitor of 0.01 to 0.1 μ F between the Cinch connector's cold side to chassis. Without this cap, the sound card would emit its dirty-ground noise via the transformer stray capacity to the cable shield, which, from an EMC point of view, would be absolutely unacceptable. In the 50/60Hz range of mains power, such a cold-end capacitor may certainly be advertised as “ground-lift”. But in the RF range, such a circuit is ground-referenced and completely unbalanced.
- Solutions:** 1. Feed the unit with a standard, ground-balanced AES3 signal (regardless of center grounded or floating).
2. When feeding the unit with an S/PDIF signal, please note the comprehensive adapter cable section on pp. 58.
- More info:** Starting p. 44 the LEDs are explained in detail.

An Important note concerning our room models

Impulse Responses created by Quantec room models are an essential element of the YARDSTICK series of devices, and are thus subject to copyright.

Any recording of these Impulse Responses (*»Room Fingerprints«*) for the purpose of inclusion in publicly accessible or freely merchantable collections, e.g. convolution libraries, is prohibited. In particular, this applies to distribution via download (*»Internet«*) or storage media (*»CD, DVD«*), regardless of whether for commercial purposes, or free of charge.

Moreover, any use of our names and terms, such as Quantec, QRS, or YARDSTICK in conjunction with 3rd-party software or convolution reverberation products is prohibited – even in the form of similar-sounding distortions, or specially designed abbreviations, which are targeted to lead someone to suspect an association with Quantec products.

For additional legal notes see our disclaimer on p. 2.

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Manufacturer Library

The manufacturer Presets for the QRS plug-in are partitioned according to their designated use. Grouped under two separated headers for music and dialog, both libraries consist of various subclasses, with numerous Presets typically sorted according to their room sizes.

All library Presets have been developed with headphone monitoring in stereo. Basically, the direct signal has been added within the YARDSTICK. If the direct signal will be fed through the mixing console instead, some Presets may sound a bit queer, as level and delay balancing may be broken. Surround channels have not been enabled yet, but may be added at the sound engineer's discretion.

Please note that for Radio Drama productions, sound effects are painted with a pretty wide brush. Priority objective was to accentuate typical acoustic peculiarities, even if one room situation or the other turns out to sound a bit disproportionate.

Music Library

From within the archives, this library is known as **Music-Lib**. This library contains Presets optimized for music, with no unpleasant or obtrusive early reflections.

For ease of operation, the Presets have been divided into classes: **SMALL Rooms**, **MEDium Rooms**, **LARge Rooms**, **CONCcert Halls**, **SACred Spaces**, **PLAtes**, and **VARious**.

SMA class – Small Rooms

SMA	SMALL Rooms	Comment
FustyCin	Fusty Cinema	doesn't work with direct path through the console
Living+F	Living Room furnished	
Living-F	Living Room unfurnished	new flat

MED class – Medium Rooms

MED	MEDium Rooms	Comment
Theater	Small Theater	student cellar theater, music club
CmbMuStu	Chamber Music Studio	

LAR class – Large Rooms

LAR	LARge Rooms	Comment
Volksbad	Müllersches Volksbad	public natatorium with tiles

CON class – Concert Halls

CON	CONCcert Halls	Comment
CHa113+A	Concert hall 10 ³ m ³ - with Audience	a classic
CHa113-A	Concert hall 10 ³ m ³ - no Audience	a classic
CHa114+A	Concert hall 10 ⁴ m ³ - with Audience	a classic
CHa114-A	Concert hall 10 ⁴ m ³ - no Audience	a classic

SAC class – Sacred Spaces

SAC	SACred Spaces	Comment
Oratory	Oratory	
Chapel	Small Church	vocal music starts here
Church	Church	organ music starts here
Cathedr1	Cathedral	
St. Peter	St.Peter in Rome	various side naves and transepts
TajMahal	TajMahal mausoleum	

PLA class – Plates

PLA	PLAtes	Comment
PLaDLY#1	Plate set with Predelay #1	
PLaDLY#2	Plate set with Predelay #2	
PLaDLY#3	Plate set with Predelay #3	
PLaDLY#4	Plate set with Predelay #4	
PLaDLY#5	Plate set with Predelay #5	
PLaDLY#6	Plate set with Predelay #6	

VAR class – Various

VAR	VARious	Comment
\$99verb	Low cost reverb, embarrassing	what others do wrong (object to be studied)
\$199verb	Low cost reverb, not much better	what others do wrong (object to be studied)
\$299verb	Typical FOH reverb	what others do wrong (object to be studied)
\$399verb	Home Recording reverb	

Dialog Library

From within the archives, this library is known as **Dialog-Lib**. This library contains lively Presets optimized for dialogs, with generously added early reflections.

For ease of operation, the Presets have been divided into classes: **CONTainers**, **VEHicles**, **SMAll Rooms**, **MEDium Rooms**, **LARge Rooms**, **BIG Rooms**, **OUTdoors**, and **VARious**.

CON class – Containers

CON	CONtainers	Comment
Breadbox	Breadbox	doesn't work with direct path through the console
Cupboard	Cupboard	solid OSB rear panel
Wardrobe	Wardrobe	booming pressboard rear panel
Bathtub	Bathtub	old free-standing enamel bath tub
OilBarrl	Oil Barrel	

VEH class – Vehicles

VEH	VEHicles	Comment
Car	Car	dialogs while driving
TruckCab	Truck Cabin	trucker romanticism, car radio with country music
BoxVan	Box Van	passenger transportation prohibited
Submarin	Submarine	

SMA class – Small Rooms

SMA	SMAl Rooms	Comment
PrvSauna	Private Sauna	doesn't work with direct path through the console
Tent	Tent	cotton fabric
Parlor	Parlor	low coloration and versatile
SmOffice	Small Office	
Garage	Car Garage	
Kitchen	Kitchen	
Bathroom	Bathroom or Lavatory	
Hall	Entrance Hall	

MED class – Medium Rooms

MED	MEDium Rooms	Comment
LgOffice	Large Office	
Cinema	Cinema	
Museum	Museum	low coloration and versatile
Clasroom	School Classroom	
Refectry	Refectory	
Bank	Bank	hardwood floor, plasterwork ceiling
BigTop	Circus Tent	plastic-coated tarpaulin
Corridor	Long Corridor	
HalStair	Hall and Staircase	door to staircase stands open
StairCas	Large Staircase	

LAR class – Large Rooms

LAR	LARge Rooms	Comment
Theater	Theater	
MuStCarP	Multi-Storey Car Park	
U-Garage	Underground Garage	
Townhall	Townhall	
BigStore	Big Store	multi-storey shopping mall
Cavern	Cavern	simulated vaults
Volksbad	Müllersches Volksbad	public natatorium with tiles

BIG class – Big Rooms

BIG	BIG Rooms	Comment
AirHangr	Aircraft Hangar	
Airport	Airport	
ConcertH	Concert Hall	
PowPlant	Power Plant	

OUT class – Outdoors

OUT	OUTdoors	Comment
AlleyWay	Alleyway	passage
NarrowSt	Narrow Street	
Backyard	Backyard	
SmallSqr	Small Square	brass ensemble or political speech
Platform	Railroad Station Platform	
SportsFd	Sports Field	
IceRink	Ice Rink	
SmalPark	Small Park	
Copse	Copse	borderline but useful

VAR class – Various

VAR	VARious	Comment
RRtunnel	Railroad Tunnel	simulation of vaults with depth
Sewerage	Sewerage	Vienna
Labyrint	Labyrinth	borderline but useful

