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User manual BEHRINGER DSP2024P
User guide BEHRINGER DSP2024P
Operating instructions BEHRINGER DSP2024P
Instructions for use BEHRINGER DSP2024P
Instruction manual BEHRINGER DSP2024P



User's Manual

ENGLISH

Version 1.2 September 2004

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Manual abstract:

3) Heed all warnings. @@@@6) Clean only with dry cloth. 7) Do not block any ventilation openings. Install in accordance with the manufacturers instructions. @@9) Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet. 10) Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.

11) Only use attachments/accessories specified by the manufacturer. 12) Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over. WARNING: To reduce the risk of fire or electric shock, do not expose this appliance to rain and moisture. The apparatus shall not be exposed to dripping or splashing and no objects filled with liquids, such as vases, shall be placed on the apparatus.

This symbol, wherever it appears, alerts you to the presence of uninsulated dangerous voltage inside the enclosure voltage that may be sufficient to constitute a risk of shock. This symbol, wherever it appears, alerts you to important operating and maintenance instructions in the accompanying literature. Please read the manual. 13) Unplug this apparatus during lightning storms or when unused for long periods of time. 14) Refer all servicing to qualified service personnel.

Service is required when the apparatus has been damaged in any way, such as power supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped. 15) CAUTION - These service instructions are for use by qualified service personnel only. To reduce the risk of electric shock do not perform any servicing other than that contained in the operation instructions unless you are qualified to do so.

2 VIRTUALIZER PRO DSP2024P FOREWORD Dear Customer, Welcome to the team of VIRTUALIZER PRO users and thank you for demonstrating your faith in us by purchasing the DSP2024P. Writing this foreword to you is an extremely pleasant task. After several months of intensive brainstorming and the subsequent realization of their ideas, our engineers finally achieved an ambitious goal: considerable improvement of an excellent piece of equipment. The VIRTUALIZER has been regarded as standard equipment for countless studios and P.A. distributors for quite a while now. As with any new product, the development of this new VIRTUALIZER PRO also meant a great deal of responsibility.

Throughout the entire planning and development phases, we kept you the discerning end-user and musician, your requirements and your requests at the focal point of our considerations. Meeting your professional expectations required a lot of effort and more than a few night shifts, but this is exactly the kind of challenge that keeps us alive and kicking. Developing a new product always brings a large number of people together, and its a great feeling when all involved can take pride in the results. It is an important part of our philosophy to share our gratification with you, since youre the most important member of the BEHRINGER team. With your highly competent suggestions for new products, youve contributed immensely to the development and success of our company. In return, we bring you uncompromising quality (manufactured under ISO9000 certified management system) as well as excellent technical and audio specifications, at an extremely favorable price. We hope that this will enable you to fully unfold your creativity without being hampered by budget constraints. We are often asked how we manage to produce such high-grade devices at such unbelievably low prices. The answer is quite simple: its you, our customers! Lots of satisfied customers means large sales volumes, which in turn enables us to reduce production and logistics expenses. We believe its only fair to pass this benefit back to you after all, your success is our success! I would like to thank everyone who helped make our new VIRTUALIZER PRO project possible and successful.

Each of those people made very personal contributions, from our engineers and designers to our numerous staff members and finally to you as a BEHRINGER user. My friends, its been worth the trouble! Thank you very much, Uli Behringer 3 VIRTUALIZER PRO DSP2024P VIRTUALIZER PRO High-Performance 24-Bit Multi-Engine Effects Processor DSP2024P s 71 breathtaking new algorithms, most in true stereo s Wave-adaptive VIRTUAL ROOM reverb algorithms for ultra-natural reverb and delay s Awesome modulation, dynamic, psychoacoustic and EQ algorithms s Innovative amp simulation, distortion and special effects s 11 effect combinations with selectable serial/parallel configuration s Up to 7 adjustable parameters plus HI and LO EQ per effect s High-resolution 24-bit A/D and D/A converters with 64/128-times oversampling s True stereo processing for realistic channel separation in stereo image s 24-bit internal signal processing, professional 46 kHz sample rate s 100 factory presets plus 100 user memory locations s Extensive MIDI implementation s Precise 8-segment LED level meters s Internal power supply for professional applications s Servo-balanced XLR and 1/4" TRS inputs and outputs s Conceived and designed by BEHRINGER Germany 4 VIRTUALIZER PRO DSP2024P TABLE OF CONTENTS 1. INTRODUCTION...

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INTROs packaging. Please dispose of all packaging materials in an environmentally-friendly fashion. The BEHRINGER VIRTUALIZER PRO requires one standard 19" rack unit of space (1 3/4"). Please leave an additional 4" installation depth to allow connections at the rear side. Make sure that there is adequate ventilation and do not place the VIRTUALIZER PRO on top of an amplifier, which could cause overheating. + Before connecting the VIRTUALIZER PRO to the mains, carefully check that your equipment is set to the correct voltage: The fuse holder on the female mains connector has 3 triangular markings, with two of these triangles opposing each other. The VIRTUALIZER PRO is set to the operating voltage printed next to these markers and can be set to another voltage by turning the fuse holder by 180°. CAUTION: This instruction does not apply to export models exclusively designed, e.g. for 120-V operation! Connection to the mains is made by a mains cable with an IEC receptacle that complies with the required safety regulations. + + Please make sure that the unit is grounded at all times. For your own protection, you should never tamper with the grounding of the cable or the unit itself. The unit shall always be connected to a mains socket outlet with a protective earthing connection. Installation and operation of this equipment must be carried out by competent staff only. Both before and after installation, the staff using the equipment should make sure that it is properly grounded since otherwise electrostatic discharge etc.

can lead to an impairment of its operation. For more information, see chapter 6 INSTALLATION. The BEHRINGER VIRTUALIZER PRO is equipped with electronically servo-balanced inputs and outputs. The circuit design features automatic hum suppression for balanced signals and thus ensures trouble-free operation, even at the highest operating levels. Externally induced mains hum, etc.

can therefore be effectively suppressed. The automatic servo-function recognizes the presence of unbalanced connectors and adjusts the nominal level internally to avoid level differences between the input and output signals (6-dB correction). The MIDI connectors (IN/OUT/THRU) are standard DIN plug connections. The data communication is isolated from ground by opto-couplers. 1.3 Control elements Fig. 1.1: VIRTUALIZER PRO front panel The BEHRINGER VIRTUALIZER PROs front panel includes five edit controls (non-intermittent rotary controls), a jog wheel (big rotary control), six parameter keys, an LED display and a mains switch. Each of the two fully independent channels can be monitored with an 8-digit LED meter. 1.

INTRODUCTION 7 VIRTUALIZER PRO DSP2024P Fig. 1.2: Display section of the VIRTUALIZER PRO 1 2 Both the LED CHAINS display the intensity of the input signal in dB in relation to the nominal level, which is selected on the rear panel with the OPERATING LEVEL switch. After you switch on the VIRTUALIZER PRO, you can read the name of the last used effect on the LED DISPLAY. When editing, the LED DISPLAY shows the parameters name along with a 4-digit alpha-numeric display that shows the absolute parameters value. To the right of the LED DISPLAY are four STATUS LEDs which indicate the type of value you are working with. You may do any of the following: s set the absolute value of an effect parameter (%), s increase or decrease the amplitude or determine the threshold point of the compressor (dB), s modify a frequency (Hz) or s modify a time parameter (sec). 3 4 The ALGORITHM GROUPS LED CHAIN indicates which category the selected effect belongs to. Altogether the DSP2024P offers eight different algorithm groups. Fig.

1.3: Function keys, controls and jog wheel 5 Every preset in the DSP2024P allows you to edit at least four effect parameters. The EDIT-LED-CHAIN indicates which parameters are adjusted by the four EDIT CONTROLS. If the top LED lights up, controls the parameter EDIT A, controls EDIT B, helps in changes of parameter EDIT C and with you change the setting of parameter EDIT D. If the middle LED of the EDIT-LED-CHAIN lights up, the four EDIT CONTROLS modify the parameters that are arranged to its left and right.

The lower LED functions correspondingly. For the exact meaning of the individual effect parameters, see chapter 7.1. + 8 1. INTRODUCTION VIRTUALIZER PRO DSP2024P 6 With the 1st EDIT CONTROL (non-intermittent rotary control) you change the values of the first (EDIT A) and fifth (EDIT E) effect parameters.

You can also select MIDI functions (MIDI) with the 1st EDIT CONTROL. Press the EDIT key to switch from EDIT A to EDIT E and vice versa. You reach the MIDI function by pressing the SETUP key. The 2nd EDIT CONTROL allows you to modify the values of effect parameters EDIT B and EDIT F. When you select the INPUT parameter with the help of the SETUP key, you can specify whether the DSP2024P functions mono or stereo mode (see chapter 3.6.2 for more information). The 3rd EDIT CONTROL modifies the values of effect parameters EDIT C, EQ LO, and the global OUTPUT parameter (see chapter 3.6.3).

Here, as well, you select among them using the EDIT and SETUP keys. With the 4th EDIT CONTROL, you modify the values of effect parameters EDIT D, EQ HI, and the global parameter CONFIG (see chapter 3.6.4). Use the EDIT and SETUP keys to choose between the parameters. During editing, you can rotate one of the four EDIT CONTROLS minimally to display a brief description of the current parameter active. This can help you know that, for example, EDIT A controls the pre delay for all reverb effects of the VIRTUALIZER PRO. After approximately one second the name is erased and the parameters current value is displayed. This function can be used only by operating one of the controls that has not yet been selected. By turning the MIX/BYPASS CONTROL the effect levels of most effect algorithms are set in the range from 0 to 100%.

If you select 0%, the signal at the inputs of DSP2024P is transferred directly to the outputs without adding any effects (the signal is completely dry). If you select 100%, only the effected signal is sent to the outputs (the signal is completely wet). If you use the DSP2024P in the aux bus with your mixing console, you should always set this value at 100%. if youre using the DSP2024P with a guitar amplifier (in a serial effects loop), we suggest settings between 20 and 50% (depending on the amplifier type). Please note that, for the effects parametric and graphic EQ, the MIX/BYPASS CONTROL allows a gain correction by rotation.

To bypass the DSP2024Ps effects, press the MIX/BYPASS CONTROL. This allows you to compare between the original and the effected signals. Press the MIX/BYPASS CONTROL again to deactivate the bypass and return to your chosen effect.



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When the MIDI IN LED below the control flickers, it indicates that MIDI data is arriving at the MIDI IN port. Both the MIX/BYPASS CONTROL and the four EDIT CONTROLS react dynamically.

This means that, depending how fast you rotate the wheels, the present parameter is changed in steps of 1, 2, 5 or 10. The faster the rotation, the greater the change in the parameter value. To select one of the 200 presets, press the PRESET key once, then rotate the JOG WHEEL. 7 8 9 + 10 + + + 11 12 To select one of the 71 basic effect algorithms, press the EFFECT key once, then rotate the JOG WHEEL. For information on the parameter values that are set for the basic effect algorithms, see chapter 7.4. To select the EDIT CONTROL function (see), press the EDIT key. 13 14 When you make changes to a user preset, the STORE keys LED begins to blink. The DSP2024P comprises 100 user presets for your own settings and 100 factory presets (see separate preset sheet). To save your changes, press the STORE key.

Select a storage space (number) with the JOG WHEEL and confirm it by pressing the STORE key again. If you have made changes to a preset and the LED of the STORE key is blinking, you can press the COMPARE key to temporarily restore the presets original settings. While these settings are loaded, the COMPARE keys LED blinks and COMP appears in the LED DISPLAY. Press the COMPARE key again to return to edit mode and store your changes. To enter SETUP mode, press the SETUP key. In setup mode, you can access the parameters shown below the four EDIT CONTROLS. For more information about SETUP mode, see chapter 3.6. 9 15 16 1. INTRODUCTION VIRTUALIZER PRO DSP2024P 17 To change a parameters value, rotate the JOG WHEEL.

To increase the value, turn the wheel clockwise. To decrease the value, turn the wheel counterclockwise. If none of the edit functions is selected, you can select a program directly with the JOG WHEEL. When you do so, a spot lights up in the LED DISPLAY. As long as the spot is illuminated, a program can be selected without making the corresponding settings immediately audible.

This brief signal suppression means that during quick selection of presets with the JOG WHEEL, not every preset is activated directly. If the JOG WHEEL is not turned for a second, the spot in the LED DISPLAY disappears and the program is loaded. Use the POWER switch to power up your DSP2024P. The POWER switch should always be in the Off position when you are about to connect your unit to the mains. To disconnect the unit from the mains, pull out the mains cord plug.

When installing the product, ensure that the plug is easily accessible. If mounting in a rack, ensure that the mains can be easily disconnected by a plug or by an all-pole disconnect switch on or near the rack. 18 + Fig. 1.4: VIRTUALIZER PRO rear panel 19 FUSE HOLDER / VOLTAGE SELECTION. Before connecting the DSP2024P, confirm that the voltage display matches your local mains voltage. When replacing the fuse, you must always use the same type. In many units the fuse holder can be installed in one of two positions, allowing you to switch between 230 V and 120 V. If you wish to operate a unit outside Europe at 120 V, then a stronger fuse must be used. (For more information, see chapter 8 SPECIFICATIONS).

The mains connection is made via the IEC receptacle. An appropriate mains cable is included. The DSP2024P has wide-ranging MIDI implementation. MIDI IN, MIDI OUT, and MIDI THRU connectors are available for transmitting MIDI commands. SERIAL NUMBER. Please complete and return the warranty card within 14 days of the date of purchase. Otherwise, you will lose your right to the extended warranty. Alternatively, you can register online at our website under www.behringer.com.

The DSP2024Ps balanced OUTPUTs are designed as 1/4" TRS and XLR sockets. To switch between -10 dBV (home recording level) and +4 dBu (professional studio level), use the OPERATING LEVEL SWITCH. When you switch between the two, the level displays are automatically changed to the nominal level and the VIRTUALIZER PRO operates in its optimal working range. Both of the VIRTUALIZER PROs INPUTs are also available as balanced 1/4" TRS and XLR sockets. 20 21 22 23 24 2.

EFFECTS ALGORITHMS All effects of digital effects equipment are based on various algorithms. An algorithm for a reverb effect, for example, is programmed differently than a chorus algorithm. Each effect has a certain algorithm with which the digital input signal is processed. The processing takes place within the digital signal processor (DSP). After the effect is generated and the input signal is mixed, the digital signal is converted back into an analog signal with a D/A converter.

You can edit up to seven parameters for each preset in the VIRTUALIZER PRO. The changes you make will influence the sound in different ways. An overview of the DSP2024Ps various effects algorithms follows. 10 2. EFFECTS ALGORITHMS VIRTUALIZER PRO DSP2024P 2.1 Reverb algorithms REVERB: As the term suggests, a reverb is a reverberation effect. The reverb can be considered as the most important effect in a mix-down or a live event.

The DSP2024P offers 12 different reverberation programs so that you have a suitable reverb for every situation. Cathedral simulates the dense, long reverberation of a large cathedral, which is appropriate for solo instruments or vocals in slow pieces. Gold Plate simulates the sound of plate reverberators and hence is a classic for drums (snare) and vocals.

Small Hall simulates a small, lively (strongly reflecting) hall. With Room, you can clearly hear the walls of the room. Studio represents a small- to middle-sized room. With Concert, you can select between a small theater and a large hall. Stage is well suited to dissipating the sound of a keyboard or an acoustic guitar. Spring Reverb simulates a classic spring reverberation. Ambience reproduces a room impression without late reflections. With Early Reflections, the initial reflections of a room are clearly audible. GATED REVERB: This effect synthetically cuts off reverberation after a period of time. It is famous in the song In the Air Tonight by Phil Collins.

REVERSE REVERB: This is a reverberation in which the envelope is reversed it slowly gets louder. Tab. 2.1: Functioning of the reverb effects parameters 2.2 Delay algorithms STEREO DELAY: A delay of the input signal.

Different tempo settings allow interesting delay effects. TAPE ECHO: Similar to the stereo delay, with the difference being that the repetitions have less presence. This simulates the character of the original tape echo that was used before the digital era and can be thought of as a Vintage Sound. The tape echos reflections include high and low pass filters. 2.

EFFECTS ALGORITHMS 11 VIRTUALIZER PRO DSP2024P PING PONG: A delay effect with changing stereo positioning, where the time intervals between the repetitions can be changed. Tab. 2.2: Functioning of the delay effects parameters 2.



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3 Modulation and Pitch Shifter effects **FLANGER**: The word flange means tape spool, and this explains the characteristics of the effect. Originally the flanger effect was generated with two tape recorders which ran synchronously. The same audio signal was recorded on both machines. If you put a finger on the left spool of one of the machines, the spool and the playback speed are slowed down. The generated delay results in phase shifting of the signals. Vintage Flanger simulates a guitar flanger effect pedal and Jet Stream Flanger sounds like a classic analog flanger.

CHORUS: This effect slightly detunes the original signal. A very pleasant detune effect is created in connection with the pitch variation. The chorus effect is quite often and extensively used for dispersing signals. Analog Chorus simulates a guitar chorus effect pedal, while Vintage Chorus imitates a classic analog studio chorus. Ultra Chorus creates the sound of an eight-person vocal chorus. **PHASER**: With the phaser, a second, phase shifted signal is added to the original audio signal. The resulting sound is thicker and above all livelier. This effect is often used for guitar sounds and keyboards. In the 70s, it was also extensively used for other instruments like electric pianos. Here, Vintage Phaser represents a guitar phaser effect pedal.

Dual Phaser processes the left and the right channels separately. **ROTARY**: The simulation of a classic effect that is normally generated with a very heavy enclosure with a (slow or fast) rotating speaker: The bass speaker (drum) is covered by a partly opened rotating cap, while both of the high pitch horns (horn), displaced by 180°, revolve around the same perpendicular axis. Here, the physical principle of the Doppler effect for modulation of signals is used.

PITCH SHIFTER: This effect changes the pitch of the input signal. You can generate musical intervals and harmonies or simply a single voice.

Detuning by several semitones upward alienates voices (and is used often in cartoons). Here, you can choose among a stereo, two, and three vocal pitch shifter. At the left stop of Edit C the pitch shifters 1 and 2 are synchronized to a stereo pitch shifter. Pitch shifter 3 can be switched off by turning Edit E fully counterclockwise. **VIBRATO**: For this effect, the peak frequency of a tone is periodically and uniformly changed (quickly or slowly).

It is often used for guitar playing. **TREMOLO**: This effect was originally found on guitar amplifiers, and is once again trendy. It is a fast or slow periodic variation of the volume. 12 2. **EFFECTS ALGORITHMS VIRTUALIZER PRO DSP2024P AUTO PANNING**: This sound effect, which was very popular in the beginnings of stereo technique, is achieved by allowing a sound source (often the lead guitar or a synthesizer) to wander from one end of the stereo image to another or by just letting it wander repeatedly. Tab. 2.3: Functioning of the modulation and pitch shifter effects parameters 2.4 Dynamic effects

COMPRESSOR/LIMITER: When the signal level exceeds the level control limit of the signal-processing unit, it must be limited dynamically to avoid distortions. This is achieved by installing a compressor or a limiter.

The limiter abruptly limits the signal above a specified threshold, while a compressor acts softly over a large range. **EXPANDER**: Background noises of all types (noise, humming etc) limit the dynamic range of the actual signal. As long as the level of the actual signal lies significantly above the background noise, the noise is inaudible. The interference signal in this case is masked by the actual signal. The expander is used to effectively expand the dynamic range of signals. Signals with small amplitudes (such as background noise) can be weakened, thereby reducing the background noise. **GATE**: On stage and in studios, there are diverse applications where a noise gate is needed. For example, microphones that tend to cause feedback can be defused. In addition, you can use a gate to eliminate unwanted noise. When used on vocals, for example, the signal is simply masked during pauses, thus eliminating all noise.

Needless to say, a gate used on vocals has to open very quickly otherwise, the first syllables of soft or whispered passages would not be audible. 2. **EFFECTS ALGORITHMS 13 VIRTUALIZER PRO DSP2024P ULTRAMIZER**: The ultramizer function divides the sound spectrum into two frequency bands and, as a result, allows inaudible but extremely effective compression. This is especially helpful during mix-down. The DSP2024P analyses the received audio material and automatically adjusts input gain and compression parameters.

DENOISER: The **DENOISER** is used to eliminate or reduce noise and other interference. **DE-ESSER**: A problem often encountered in recording situations, is the sibilant (Ssss) sound of the human voice. The de-esser is used to remove strong hissing sounds from the audio signal. **WAVE DESIGNER**: Using this effect, you can influence the envelope of a signal by specifying its volume. A (= Attack) indicates the time a tone needs to reach its full volume.

R (= Release) determines how long it takes before a tone dies away. Tab. 2.4: Functioning of the dynamic effects parameters 2.5 Psycho-acoustic effects **EXCITER**: An exciter works with psycho-acoustic principles to add artificially generated overtones to the original signal, thereby increasing its presence and loudness (the subjective volume impression) without any significant increase of the signal level. **ENHANCER**: The enhancer works like a dynamic pitch equalizer. Its effectiveness depends on the associated high frequencies and the intensity of the input signal. 14 2. **EFFECTS ALGORITHMS VIRTUALIZER PRO DSP2024P ULTRA BASS**: This awesome combination of sub-harmonic processor, bass exciter, and limiter adds a final touch to your music production.

STEREO IMAGER: This effect is used to process stereo main signals.

The signal is first subdivided into middle and side signal (MS Matrix). Both parts can then be amplified when desired and placed on the stereo image. **ULTRA WIDE**: This effect is suitable to pep up speaker systems with an especially broad stereo image. **BINAURALIZER**: The binauralizer also extends the stereo image. Additionally, it compensates for interchannel cross talk of both speakers (left loudspeaker on right ear and vice versa). Tab. 2.5: Functioning of the psycho-acoustic effects parameters 2.6 Filter/EQ effects **FILTER**: Filters, in general, influence the frequency response of a signal. A low pass filter allows low frequencies to pass and suppresses high frequencies, while a high pass filter allows high frequencies to pass and suppresses low frequencies.

PARAMETRIC EQ: The parametric equalizer is the most highly-developed form of equalization. @@@@2. **EFFECTS ALGORITHMS 15**

VIRTUALIZER PRO DSP2024P Tab. @@@@This is a classic sound in rock music. @@@@**FUZZ**: This is a special guitar distortion type.

@@@@The **VIRTUALIZER PROs** fuzz works in three different frequency bands. @@@@You can also use a parametric equalizer to further refine the sound.



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@@@This effect is very well suited for vocal alienation (robot voice). @@@@This trend is known as Lo-Fi (instead of Hi-Fi).

@@@@@EFFECTS ALGORITHMS VIRTUALIZER PRO DSP2024P Tab.

2.7: Parameter functions of distortion effects and amplification simulations 2.8 Special effects VINYLIZER: This effect adds clicks and/or noise to your audio signal, simulating old vinyl records and tape recorders. SAMPLER: This sampler allows you to record up to five seconds of program material. Use Edit A for recording and Edit B for playback of the sampled material. + To clear the contents of the sampler, select a different effect. VOCODER: The vocoder, an old acquaintance, has become popular again due to the disco renaissance (hear it in Around the World by Daft Punk or California by 2Pac). A control signal (usually a voice) is used in the right channel to modulate another signal which lies on the left channel (usually a synthesizer sound). It sounds as if the synthesizer is talking (robot voice). 2.

EFFECTS ALGORITHMS 17 VIRTUALIZER PRO DSP2024P VOICE CANCELER: The voice canceler is a very effective Karaoke effect. It allows removal of mono vocal parts in stereo recordings. The bass part, however, remains untouched. RESONATOR: A resonator simulates an oscillating system that amplifies a specific frequency. The resonator implemented here has a resonance frequency that can be modulated with positive and negative feedbacks of up to 100%.

Tab. 2.8: Parameter functions of special effects 2.9 Effects algorithm combinations (multi-effects programs) Effects 61 to 71 are multi-effects algorithms, which allow different effects to be used simultaneously. Effect 61, for example, can make a solo guitar wider with chorus and simultaneously add a room reverb.

Please note that you can modify the structure of a multi-effect (see chapters 3.1 and 3.6.4). CHORUS & REVERB: This algorithm combines the popular chorus with a gold plate effect (as in algorithm 2).

FLANGER & REVERB: The combination of flanger and reverb effects. ROTARY & REVERB: The input signal, modulated to a degree that you specify, is then processed with a reverb effect. This effect works especially well with keyboards and guitars. PITCH & REVERB: The pitch shifter can be detuned in semitone or cent steps. The reverb, on the other hand, can be controlled in time and mixing ratio.

DELAY & REVERB: Delay and reverb are the most common combinations for vocals, solo guitars, etc. The reverb used here is a gold plate, a room that features a distinctive brilliance and can be used in many ways. TREMOLO & REVERB: The intensive variation in volume of the tremolo gains more depth and wideness with the reverb. PHASER & REVERB: The combination of a classic stereo phaser and a reverb effect. 18 2. EFFECTS ALGORITHMS

VIRTUALIZER PRO DSP2024P CHORUS & DELAY: While the chorus can contribute to a wideness of the signal, interesting repetition effects can be adjusted with the delay. Vocals can be given a distinctive effect without making the voice sounding blurred. FLANGER & DELAY: This effect is just right for creating a modern, slightly spacey vocal sound. PITCH & DELAY: A repetition of the audio signal, with an oscillatory effect added by the pitch shifter.

TREMOLO & DELAY: A fast or slow, intensive variation of volume, which is additionally processed with a panorama effect.

Tab. 2.9: Parameter functions of multi-effects programs + For an overview of the parameters available in the individual programs refer to chapter 7.1. 2.

EFFECTS ALGORITHMS 19 VIRTUALIZER PRO DSP2024P 3. OPERATION 3.1 Effects structure Fig. 3.1: Effects structure, part 1 20 3.

OPERATION VIRTUALIZER PRO DSP2024P Fig. 3.2: Effects structure, part 2 3. OPERATION 21 VIRTUALIZER PRO DSP2024P Fig. 3.

3: Effects structure, part 3 22 3. OPERATION VIRTUALIZER PRO DSP2024P 3.2 Calling up presets The VIRTUALIZER PRO has 100 internal presets and 100 user presets that can be overwritten. The two memory banks are located one after another. The internal presets (I.

000 - I.100) come first and the user presets (U.000 - U.100) follow. After switching on the unit, the last used preset is automatically restored. To choose a different preset, press the PRESET key, then rotate the JOG WHEEL. To see the presets in ascending order, rotate the wheel clockwise. To see the presets in descending order, rotate it counterclockwise. + Please note that it takes the VIRTUALIZER PRO about one second to activate each newly selected preset. The activation process is indicated by a blinking light on the display.

After the new effects data is loaded, the VIRTUALIZER PRO activates the preset and the light fades. This brief signal suppression means that during quick selection of presets with the JOG WHEEL, not every preset is activated directly. Otherwise, there could be partial shreds of various presets at the audio outputs of the DSP2024P. The VIRTUALIZER PRO gives you the security that unwanted programs are not loaded. In addition, you can quickly turn the JOG WHEEL and still have enough time to specifically select a preset without activating neighboring programs. Please note that various effects algorithms may have different volume levels. Reduce the volume of your monitors while selecting new presets to prevent sudden changes in volume. + 3.3 Editing programs (edit mode) Programs can be edited easily and quickly with the DSP2024P. The list on the right side of the LED DISPLAY gives you an overview of the effects algorithms that the VIRTUALIZER PRO can generate.

To select these basic algorithms, press the EFFECT key and rotate the JOG WHEEL. By turning the EDIT CONTROLS and the MIX/BYPASS CONTROL, you can extensively modify the sound of an effects program. You select the EDIT CONTROL function using the EDIT key. By repeatedly pressing the EDIT key, you can (for example) specify whether parameter EDIT A or EDIT E will be changed with the 1st EDIT CONTROL. The currently illuminated LED indicates which parameters will be edited.

By modifying the EQ LO and EQ HI parameters, you can put the final touch on an effect. As soon as you start editing, the LED of the PRESET or EFFECT key (depending on whether you have already loaded one of the 200 presets or have selected one of the basic algorithms) dies out. Simultaneously, the LED of the STORE key starts to blink, indicating that changes have been made. 3.4 Storing programs To store changes to one of the 100 user presets, as described in chapter 3.

3, you use the STORE key. All changes to the DSP2024Ps parameters can be stored when the STORE key's LED blinks. For your changes to be accepted, you must press the STORE key twice. An example: s You call up a program and make changes to it using the four EDIT CONTROLS and the MIX/BYPASS CONTROL. Each EDIT CONTROL controls two parameters that can be selected by pressing the EDIT key. During this process, the STORE key blinks, indicating that the presets settings have been changed.



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However, your changes are not yet stored. If you want to overwrite the original preset, simply press the STORE key twice to store your changes. If you wish to retain the original preset, press the STORE key once. The display shows the current preset number and starts blinking.

Use the JOG WHEEL to select another preset, which you will overwrite. Press the STORE key again and your changes are stored in the selected preset. + If there is no input for about five seconds after pressing the STORE key, the unit goes back to edit mode. 3. OPERATION 23 + VIRTUALIZER PRO DSP2024P If you make changes in a preset and press the STORE key twice, all of the presets original settings are overwritten and your new parameters are stored. If you want to retain the old preset, you must select another preset (using the JOG WHEEL) before pressing the STORE key for the second time. 3.5 Comparing an edited preset with the corresponding factory preset (COMPARE function) When you have made changes in a preset but have not yet stored your changes, the COMPARE Function allows you to load the original factory preset and compare it with your changes. To do so, press the COMPARE key while in edit mode.

As long as the COMPARE keys LED blinks, further editing is (temporarily) not possible.

Press the COMPARE key again to return to your edited preset. Here, you have the choice to either store your changes (see chapter 3.4), or continue editing (see chapter 3.3). 3.

6 SETUP mode In SETUP mode, you can make global adjustments to the VIRTUALIZER PRO as described in the subsections below. Among these are MIDI, INPUT mode, OUTPUT mode and dual engine configuration (CONFIG). To enter SETUP mode, press the SETUP key. The red LED below the EDIT CONTROLS lights up. The four EDIT CONTROLS can now be used to adjust the SETUP parameters.

To exit this mode, press the SETUP key again. 3.6.1 MIDI control The DSP2024Ps MIDI editing options are shown on seven pages. Enter SETUP mode (see chapter 3.6). With the help of the 1st EDIT CONTROL, you can select seven different MIDI functions. Data input is always carried out with the JOG WHEEL. the following pages can be selected: s CHAN: You can set the MIDI channel on the first page. With the JOG WHEEL, the channel can be set from 01 to 16.

If you select OFF, the MIDI function is switched off. s OMNI: The second page gives access to omni mode. In this case, the unit receives MIDI data on all 16 MIDI channels. ON appears in the DISPLAY. With the JOG WHEEL, select OFF to deactivate omni mode. s CONT: On the third page, you can configure the controller commands. You can choose between four controller modes: Tab. 3.1: Controller settings For controller functions see table 7.4 in chapter 7 APPENDIX.

s PRGM: Page four will bring you to the setup for the program changes. Once again, you have four modes to select from: Tab. 3.2: Program change settings 24 3. OPERATION VIRTUALIZER PRO DSP2024P s STOR: On the fifth page, you can select the Store Enable mode.

In the ON mode, the VIRTUALIZER PRO receives controller 112 as the direct storage commandthe current settings are stored on the program location corresponding to the controller value without waiting for a confirmation. In the OFF mode, controller 112 is ignored. + CAUTION: The Store Enable mode is aimed to transfer several presets at once from an external PC to the VIRTUALIZER PRO (see also chapter 5.1). In this mode, you can very easily overwrite your program locations by unintentionally sending controller 112 values to the DSP2024P! Therefore, we strongly recommend to switch off this mode immediately after use.

When the DSP2024P is switched on, this mode is automatically set to off (OFF). s DUMP: Select the System Exclusive mode (SysEx) using the sixth page. In this mode, the DSP2024P is ready to dump its complete storage content, including all settings, to a MIDI sequencer. Start your MIDI sequencer and turn the JOG WHEEL. The data transfer is indicated by GO. s DR.EN: In this mode, the DSP2024P can receive SysEx data from another MIDI device. To load this data, turn the JOG WHEEL slightly so that the DISPLAY blinks. Start your sequencer, and all of your settings, including preset parameter settings, are received by your VIRTUALIZER PRO. Data transfer is interrupted by turning the JOG WHEEL slightly so that ---- appears in the DISPLAY.

+ During a SysEx data transfer, all audio functions of the VIRTUALIZER PRO are inactive. 3.6.2 INPUT mode With the help of the 2nd EDIT CONTROL, you can specify whether your DSP2024P works as a mono (MONO) or a stereo unit (STER). In mono mode, input 1 is used exclusively. Since the VIRTUALIZER PRO is a real True Stereo device, the DSP processes the signal for many effects separately for both channels (see chapter 7.1). For effects 13 - 15 and 38, right and left channel parameters can even be edited separately. + For effects 42 - 44, 58, and 59, a signal must be present at both inputs for optimal stereo results. 3.

6.3 OUTPUT mode Use the 3rd EDIT CONTROL to determine the DSP2024Ps OUTPUT mode. The selection of settings depends on your DSP2024Ps application. If youre using the VIRTUALIZER PRO in connection with a mixing console (aux bus), activate the Mix External (EXTN) output mode. The DSP2024Ps output signal is then 100% wet.

If youre using the DSP2024P with a guitar amplifier that has an effects loop, select the Mix Internal (INTN) output mode. Then, use the MIX/BYPASS CONTROL to adjust the effect volume. For further information, see chapters 4.2 and 4.4.

3.6.4 Dual engine configuration (CONFIG) You can use the 4th EDIT CONTROL to decide how the DSP2024Ps effects combinations (presets 61 - 71) should be structured. Since the DSP2024P is a true Dual Engine unit, you can choose between serial 1 (SER1), serial 2 (SER2) and parallel (PARA). See fig. 3.1, 3.2 and 3.3 to understand how these settings influence the composition of the effects combinations. In the example of preset 61 (chorus & reverb), you can decide, whether the chorus and reverb effects run separately from each other or whether the signal, treated by the chorus, passes the reverb effect.

3. OPERATION 25 VIRTUALIZER PRO DSP2024P 3.7 Restoring the factory presets To restore the DSP2024P to its preset factory state, press and hold the STORE and PRESET keys while switching on the unit. INIT appears in the DISPLAY and counting takes place from R 1 to R 100. + This overwrites all changes you have made and restores the factory presets! 4. APPLICATIONS The BEHRINGER VIRTUALIZER PRO is a flexible unit that can be used in various applications. Prior to a presentation of the DSP2024Ps many uses, please note the following remarks on how to set signal levels correctly. 4.1 Level setting Take care to set all levels properly on the DSP2024P! Low levels deteriorate the dynamics of the music signal, which results in a poor, weak and noisy sound. On the other hand, excess levels overdriving the converters in the VIRTUALIZER PRO should also be avoided.

Digital distortion is (unlike its analog counterpart) extremely unpleasant, since it does not occur gradually but abruptly.



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Please use the OPERATING LEVEL switch and the input level meter of the DSP2024P. Make sure that the Clip LEDs flickers only rarely. Ensure that they never light up all the time! 4.2 Using the VIRTUALIZER PRO in the aux bus Using the DSP2024P in the aux bus lets you feed signals from one, several or all channels of your console into the VIRTUALIZER PRO.

When miking a drum kit, for example, you can use the aux controls to adjust the reverb independently for each channel. Thus, you are able to assign a strong reverb to the snare rather than the toms. Cabling the VIRTUALIZER PRO in the aux bus should be carried out as follows: Fig. 4.1: Wiring aux busses

Connect both inputs of the VIRTUALIZER PRO to the aux send outputs of your mixer.

The DSP2024Ps output socket is connected to the aux return inputs of your mixer. If you want to operate the BEHRINGER VIRTUALIZER PRO in mono, connect one of its channels (left or right) to an aux bus. As a matter of principle, effects processors should always be connected to post fader aux busses. 26 4. APPLICATIONS VIRTUALIZER PRO DSP2024P + + If your mixing console has aux busses that feature one jack for the aux send, use audio channel 1 on the DSP2024P. In this case, you must choose the mono mode (see chapter 3.6.2). To avoid damage to your equipment, turn down the volume level on your amplifier when making connections. Switch off the devices that you want to connect to one another until plug connections have been completed as described.

Lets assume you want to operate the DSP2024P in a live situation in connection with a mixing console, and use a chorus to enhance the guitar sound.

Connect the VIRTUALIZER PRO to the aux busses of your mixing console (fig. 4.1). Make the mains connection and set the operating level if necessary. Switch on the unit. In SETUP mode (output), select EXTN to ensure that the Mix External mode is activated. Press the EFFECT key and use the JOG WHEEL to select the stereo chorus effect (no. 16). Turn up the aux busses slowly till you have mixed the desired effect with the guitar signal.

After this, you can start fine tuning. You will probably want to specify the chorus modulation. Turn the 1st EDIT CONTROL to determine the speed of the modulation. To adjust the modulation depth, turn the 2nd EDIT CONTROL. Proceed further following this principle.

If you want the 1st EDIT CONTROL to change EDIT E, you must first press the EDIT key. After all the parameters have been changed as you wish, you can store the modifications in the original (or a different) preset. 4.3 Using the VIRTUALIZER PRO in the insert path Generally, you can use the DSP2024P on channel or subgroup inserts, using a standard insert cable. Connection to a channel insert makes sense when you want to process very specific signals (e. g. vocals) with the VIRTUALIZER PRO, or when all other options for connecting the DSP2024P are already used by other units. For compressors, expanders and gates, the channel insert is the best choice. Fig. 4.2: Wiring the VIRTUALIZER PRO in the insert path 4. APPLICATIONS 27 VIRTUALIZER PRO DSP2024P 4.4 Using the VIRTUALIZER PRO as an effects device for instruments Due to its MIDI implementation, the VIRTUALIZER PRO can also be used as multi-effects unit in a guitar rack. Naturally, the VIRTUALIZER PRO can be cabled both as mono and as stereo unit. The following examples show how to use the DSP2024P with a guitar setup.

Fig. 4.3: Connecting the VIRTUALIZER PRO to a guitar amp (send/return mono) Fundamentally, the following applies: The VIRTUALIZER PRO should be connected between preamp and output stage of your amplifier. For this purpose, most of the guitar amplifiers offer an effects loop, which allows the preamp signal of your amplifier to pass on to the audio input stage of the DSP2024P. Then, in the VIRTUALIZER PRO, the preamp signal is processed and sent back to its amplifier through the amplifiers return jack (Power Amp In). If you use a stereo rack system for amplification, you can also set up the VIRTUALIZER PRO in stereo mode. Connect the preamp to the audio inputs of the DSP2024P. Each of its audio outputs (left/right) is connected to a channel (left/right) of your amplifier. + Since most guitar amps only feature a serial effects loop, you should make sure that the VIRTUALIZER PRO is set to Mix Internal mode. In Mix Internal mode, you can control the effects intensity that is applied to the guitar signal.

If, however, your amp is equipped with a parallel effects loop, which allows for adding the effects signal portion (similar to an aux bus in a mixing console), then you should set the VIRTUALIZER PRO to Mix External mode. In this case, the effects intensity present at the outputs of the VIRTUALIZER PRO is 100%. Instrumentalists can benefit from a variety of advantages offered by the VIRTUALIZER PROs MIDI implementation. With a MIDI foot controller, e.g. the BEHRINGER MIDI FOOT CONTROLLER FCB1010, you can transfer program changes via MIDI.

Connect the MIDI out port of your foot controller to the MIDI IN port of the VIRTUALIZER PRO. If the DSP2024P does not respond to your foot controllers program changes, check your MIDI channel settings. Determine which MIDI channel your foot controller uses to send program changes (in most of the cases: omni mode). Set the VIRTUALIZER PROs MIDI channel to the same number and switch program change receive mode on (see chapter 3.6.

1). If your MIDI foot controller can send MIDI controller data, you can change parameters while playing. For example, you can change the effect from 0% to 100% with the controller while playing. Set controller No. 116 to the Mix Internal function (value 1) and increase the effect (value 0 - 100) with controller No. 111. In this way, you can provide a guitar solo with chorus and delay, before removing the effects for a dry rhythm sound. You can even control the bypass function with your controller (contr. 113, value 0 = OUT, value 1 = IN). Bypassing the VIRTUALIZER PRO can be activated this way if you need an unprocessed signal.

These procedures are generally possible with all MIDI devices which are capable of transmitting controller commands (like keyboards, sequencers, etc.). 28 4. APPLICATIONS VIRTUALIZER PRO DSP2024P The DSP2024P can also be used between the outputs of your keyboard and the inputs of your mixer. If necessary, adjust the operating level with the corresponding switch on the rear panel of the unit. 4.5 Using the VIRTUALIZER PRO in a MIDI setup Thanks to the integrated MIDI interface, you can incorporate the DSP2024P in a MIDI setup. The VIRTUALIZER PRO can receive and send both program changes and controller changes. Thus, you can use program changes using MIDI with a sequencer or with any other MIDI device. Connect the DSP2024P e. g. as follows: Fig. 4.4: VIRTUALIZER PRO in MIDI connection with a sequencer (computer) and a keyboard 5. MIDI FUNCTIONS OF THE DSP2024P Due to the complete implementation of the MIDI interface, it is very easy to integrate the VIRTUALIZER PRO in a MIDI System.



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s MIDI IN All MIDI data that are sent to the DSP2024P (sequencer, MIDI foot controller, etc.) are received at the MIDI IN port. If you want to use the DSP2024P as an effects unit in a guitar rack, you can connect a MIDI foot controller to the MIDI IN socket, and use it to change the program presets. If you are simultaneously operating another MIDI device, you can transfer the control commands of the MIDI foot controller using the MIDI THRU socket of the VIRTUALIZER PRO. s MIDI THRU The MIDI THRU socket allows you to loop through incoming MIDI signals.

All control commands that arrive at the MIDI IN socket can be passed on to other MIDI devices and instruments using the MIDI THRU socket. s MIDI OUT

Use the MIDI OUT to send data to a connected computer or other VIRTUALIZER PRO. 5.1 Saving data via MIDI To store all presets outside the VIRTUALIZER PRO, you can use a special form of MIDI communication called system exclusive data (SysEx). With SysEx, the VIRTUALIZER PRO sends information about its manufacturer, unit type, and all parameter settings for all presets to a sequencer or MIDI file recorder. To 5. MIDI FUNCTIONS OF THE DSP2024P 29 VIRTUALIZER PRO DSP2024P activate this very practical function, press the SETUP key in SETUP mode. Turn the 1st EDIT CONTROL to select DUMP. Your VIRTUALIZER PRO is now ready to transfer your system exclusive data. Select a track on your MIDI sequencer, get ready for recording, start the recording and turn the JOG WHEEL.

The data transfer is indicated by a GO in the DISPLAY. To load the data back into the DSP2024P, select DR.EN in SETUP mode (see chapter 3.6.1). Turn the JOG WHEEL until DR.EN blinks. Now, start your MIDI sequencer and the preset data is automatically transferred to the DSP2024P. In this mode, information sent from the MIDI sequencer is automatically stored while receiving, without asking for confirmation. 6.

INSTALLATION 6.1 Mains connection Before connecting the VIRTUALIZER PRO to the mains, please carefully check that your equipment is set to the correct voltage! The fuse holder on the mains socket has 3 triangular markings. Two of these triangles are located opposite each other. The VIRTUALIZER PRO is set at the operating voltage indicated beside the markings and can be changed by turning the fuse holder by 180°. CAUTION: This is not applicable for export models, which were designed only for a mains voltage of 120 V! Connection to the mains is made by means of a mains cable with an IEC receptacle which complies with the required safety regulations.

+ Please note that all pieces of equipment must be grounded. For your own safety, under no circumstances should you remove or deactivate the grounding of the equipment or the mains cable. 6.2 Audio connections As standard, the BEHRINGER VIRTUALIZER PRO features electronically servo-balanced inputs and outputs. If possible, connect the unit to other devices in a balanced configuration to allow for maximum interference immunity.

+ Installation and operation of this equipment must be carried out by competent staff only. Both before and after installation, the staff using the equipment should make sure that it is properly grounded since otherwise electrostatic discharge etc. can lead to an impairment of its operation. 30 6. INSTALLATION VIRTUALIZER PRO DSP2024P Fig. 6.1: Different plug types 6.3 MIDI connections The MIDI connectors at the rear panel of the unit are equipped with internationally standardized 5 pin DIN sockets. You'll need a MIDI cable to connect the VIRTUALIZER PRO with other MIDI devices. As a rule, standard ready-to-use cables can be used.

With a two core shielded cable (e.g. microphone cable) and two possible stable 180 deg. DIN plugs, you can also solder a MIDI cable yourself: Pin 2 (middle) = shield, pin 4 and 5 (right and left of pin 2) = Inner conductor, Pin 1 and 3 (both lying outside) remain free. MIDI cables should not be longer than 15 meters. MIDI IN: is used for receiving MIDI data. The receiving channel is selected in the SETUP menu. MIDI THRU: At the MIDI THRU socket, the MIDI data that arrive at the MIDI IN socket can be looped through. Several VIRTUALIZER PROs can be linked using MIDI THRU sockets. MIDI OUT: Via MIDI OUT, you can send data to a connected computer or to other VIRTUALIZER PROs.

Program data and status information are transmitted for signal processing. 6.4 Selecting the operating level The BEHRINGER VIRTUALIZER PRO allows you to switch the internal operating level with the OPERATING LEVEL switches on the rear panel of the unit. Thus, you can choose between the homerecording level (-10 dBV) and the professional studio level (+4 dBu). With this adjustment, the VIRTUALIZER PRO is adapted to the optimal operating level.

Use the input level meter on the front panel to find the appropriate operating level. 6. INSTALLATION 31 VIRTUALIZER PRO DSP2024P 7. APPENDIX 7.1 Parameter overview Tab.

7.1: Overview of the individual parameters of effects types (continued on next page) 32 7. APPENDIX VIRTUALIZER PRO DSP2024P Tab. 7.2: Overview of the individual parameters of effects types (continuation) 7. APPENDIX 33 VIRTUALIZER PRO DSP2024P 7.2 MIDI implementation Tab. 7.3: MIDI implementation chart Tab. 7.

4: Controller functions with MIDI 34 7. APPENDIX VIRTUALIZER PRO DSP2024P 7.3 Default settings Tab. 7.5: Parameter default settings of effects algorithms (continued on next page) 7. APPENDIX 35 VIRTUALIZER PRO DSP2024P Tab. 7.6: Parameter default settings of effects algorithms (continuation) 36 7. APPENDIX VIRTUALIZER PRO DSP2024P 7.4 Parameter range of effects algorithms Tab.

7.7: Parameter range of effects algorithms (continued on next page) 7. APPENDIX 37 VIRTUALIZER PRO DSP2024P Tab. 7.8: Parameter range of effects algorithms (continuation) 38 7.

APPENDIX VIRTUALIZER PRO DSP2024P 8. SPECIFICATIONS ANALOG INPUTS Connectors Type Impedance Nominal Operating Level Max. Input Level ANALOG OUTPUTS Connectors Type Impedance Max. Output Level SYSTEM SPECIFICATIONS Bandwidth SNR THD Crosstalk MIDI INTERFACE Type DIGITAL PROCESSING Converters Sampling Rate DISPLAY Type POWER SUPPLY Voltage XLR and 1/4" TRS RF filtered, servo-balanced input stage 80 k balanced -10 dBV or +4 dBu (selectable) +15 dBu at +4 dBu nominal level, +1 dBV at -10 dBV nominal level XLR and 1/4" TRS Electronically servo-balanced output stage 80 balanced +15 dBu at +4 dBu nominal level, +1 dBV at -10 dBV nominal level 20 Hz to 20 kHz, +/- 3 dB 91 dB, unweighted, 20 Hz to 20 kHz 0.018 % typ.

@ +4 dBu, 1 kHz, 0 dBu input, gain 1 < -76 dB 5-pin DIN-socket IN / OUT / THRU 24-bit Sigma-Delta, 64/128-times oversampling 46.875 kHz 4-digit 14 segment alpha-numeric LED-Display USA/Canada 120 V~, 60 Hz Europe/U.K./Australia 230 V~, 50 Hz Japan 100 V~, 50 - 60 Hz General export model 120/230 V~, 50 - 60 Hz 100 - 120 V~: T 200 mA H 250 V 200 - 240 V~: T 100 mA L 250 V 15 Watts max. Standard IEC receptacle 1 3/4" x 19" x 8" (44 mm x 482,6 mm x 204,4 mm) approx.



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4 1/2 lbs (2 kg) approx. 6 2/3 lbs (3 kg) Fuse Power Consumption Mains Connection PHYSICAL Dimensions (H x W x D) Net Weight Shipping Weight
BEHRINGER is constantly striving to maintain the highest professional standards. As a result of these efforts, modifications may be made from time to time to existing products without prior notice. Specifications and appearance may differ from those listed or illustrated. 8.

SPECIFICATIONS 39 VIRTUALIZER PRO DSP2024P 9. WARRANTY § 1 WARRANTY CARD/ONLINE REGISTRATION To be protected by the extended warranty, the buyer must complete and return the enclosed warranty card within 14 days of the date of purchase to BEHRINGER Spezielle Studioteknik GmbH, in accordance with the conditions stipulated in § 3. Failure to return the card in due time (date as per postmark) will void any extended warranty claims. Based on the conditions herein, the buyer may also choose to use the online registration option via the Internet (www.behringer.com or www.behringer.de). § 2 WARRANTY 1. BEHRINGER (BEHRINGER Spezielle Studioteknik GmbH including all BEHRINGER subsidiaries listed on the enclosed page, except BEHRINGER Japan) warrants the mechanical and electronic components of this product to be free of defects in material and workmanship for a period of one (1) year* from the original date of purchase, in accordance with the warranty regulations described below.

If the product shows any defects within the specified warranty period that are not excluded from this warranty as described under § 4, BEHRINGER shall, at its discretion, either replace or repair the product using suitable new or reconditioned parts. In the case that other parts are used which constitute an improvement, BEHRINGER may, at its discretion, charge the customer for the additional cost of these parts. 2. If the warranty claim proves to be justified, the product will be returned to the user freight prepaid. 3.

Warranty claims other than those indicated above are expressly excluded. § 3 RETURN AUTHORIZATION NUMBER 1. To obtain warranty service, the buyer (or his authorized dealer) must call BEHRINGER (see enclosed list) during normal business hours BEFORE returning the product. All inquiries must be accompanied by a description of the problem. BEHRINGER will then issue a return authorization number.

2. Subsequently, the product must be returned in its original shipping carton, together with the return authorization number to the address indicated by BEHRINGER. 3. Shipments without freight prepaid will not be accepted. § 4 WARRANTY REGULATIONS 1. Warranty services will be furnished only if the product is accompanied by a copy of the original retail dealers invoice. Any product deemed eligible for repair or replacement under the terms of this warranty will be repaired or replaced. 2. If the product needs to be modified or adapted in order to comply with applicable technical or safety standards on a national or local level, in any country which is not the country for which the product was originally developed and manufactured, this modification/adaptation shall not be considered a defect in materials or workmanship. The warranty does not cover any such modification/adaptation, irrespective of whether it was carried out properly or not.

@@@3. @@@@4. @@s connection or operation of the unit in any way that does not comply with the technical or safety regulations applicable in the country where the product is used. s damages/defects caused by force majeure or any other condition that is beyond the control of BEHRINGER. 5. Any repair or opening of the unit carried out by unauthorized personnel (user included) will void the warranty. 6. If an inspection of the product by BEHRINGER shows that the defect in question is not covered by the warranty, the inspection costs are payable by the customer. 7. Products which do not meet the terms of this warranty will be repaired exclusively at the buyers expense.

BEHRINGER will inform the buyer of any such circumstance. If the buyer fails to submit a written repair order within 6 weeks after notification, BEHRINGER will return the unit C.O.D. with a separate invoice for freight and packing.

Such costs will also be invoiced separately when the buyer has sent in a written repair order. § 5 WARRANTY TRANSFERABILITY This warranty is extended exclusively to the original buyer (customer of retail dealer) and is not transferable to anyone who may subsequently purchase this product. No other person (retail dealer, etc.) shall be entitled to give any warranty promise on behalf of BEHRINGER. § 6 CLAIM FOR DAMAGES Failure of BEHRINGER to provide proper warranty service shall not entitle the buyer to claim (consequential) damages.

In no event shall the liability of BEHRINGER exceed the invoiced value of the product. § 7 OTHER WARRANTY RIGHTS AND NATIONAL LAW 1. This warranty does not exclude or limit the buyers statutory rights provided by national law, in particular, any such rights against the seller that arise from a legally effective purchase contract. 2. The warranty regulations mentioned herein are applicable unless they constitute an infringement of national warranty law. * Customers in the European Union please contact BEHRINGER Germany Support for further details. Technical specifications and appearance subject to change without notice. The information contained herein is correct at the time of printing. The names of companies, institutions or publications pictured or mentioned and their respective logos are registered trademarks of their respective owners. Their use neither constitutes a claim of the trademarks by BEHRINGER® nor affiliation of the trademark owners with BEHRINGER®.

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II, Germany. Tel.

+49 2154 9206 0, Fax +49 2154 9206 4903 40 9. WARRANTY .



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