Manual

TDx

Transient Designer 500 Series Rack Module

Content

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Version 1.0 – 02/2016

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This manual contains a description of the product Transient Design TDx. In no way it represents a guarantee of particular characteristics or results of use.

The information in this document has been carefully compiled and verified and, unless otherwise stated or agreed upon, correctly describes the product. Sound Performance Lab (SPL) continuously strives to improve its products and reserves the right to modify the product described in this manual at any time without prior notice.

Scope of Delivery

TDx – 500 Series Rack Module

Quickstart/Product Overview

Measurement & Weight

Singe Slot 500 Series Rack Module

Weight: 1.53 lbs (0.65 kg)

Please keep the original packaging. In case of a service procedure the original packaging ensures a safe transport. It also serves as a safe packaging for your own transports if you do not use special transportation cases.

Welcome

and thank you for purchasing the Transient Designer TDx. With the Transient Designer TDx the level-independent processing of signal paths is making headway into the world of 500 series rack modules. However, the possibilities for studio and live application are seemingly endless.

Technical foundation is SPL's Differential Envelope Technology (DET) which allows level-independent dynamic processing by calculating differences in generated envelopes. In this it differs in principle from common compressors that are based upon processing signals of a specific level. These envelopes are always tracking the curve of the original signal to provide optimal results in every moment of the music.

Thanks to the level-independent processing DET the setting of a threshold is needless. Other common controls of dynamic processing, such as ratio or parameters for time-constants are automated and optimized adaptively in a musical manner according to the characteristics of the input signal.

Specifications

General

Frequency Response: 10 Hz - › 100 kHz

Noise: -93 dBu (A-weighted)

Dynamic Range: 116 dB

Common Mode Rejection Ratio: › 80 dB (at 1 kHz)

Total Harmonic Distortion and Noise (THD+N): 0.03% (0 dBu input level/unity gain)

Current consumption: 30 mA at +/- 16 Volt DC

Input

Electronically balanced

Impedance: approx. 20 kohms

Max. Input Level: +22 dBu

Output

Electronically balanced

Impedance: approx. 150 ohms

Max. Output Level: +22 dBu

Installation into a 500 series rack

- Please read the manual that comes with the 500 series rack. You should gain all information necessary for the installation process.
- Your 500 series rack should be switched off and the power cable should not be connected.
- Insert the TDx module into a free slot of your rack. Make shure the connector of the TDx is precisely aligned with the rack connector.
- Press the TDx module carefully into the rack connector and tighten the screws.
- Connect the TDx module with your audio environment using the connections from your 500 series rack.
- Insert the power cable to the 500 series rack and switch it on.

Control Elements

On/Bypass

With the ON/Bypass button you can switch the TDx into the signal path. If the button is in position “On”, the TDx is active. If the button is in position “Bypass”, the audio signal passes through unprocessed.

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ATTACK

With the ATTACK control you can amplify or attenuate the attack of a signal by up to 15 dB. For more information on the operation of the ATTACK control please refer to “The ATTACK Control Circuitry” on page 23.

The ATTACK control circuitry uses two envelope generators. One follows the shape of the original curve and adapts perfectly to the dynamic gradient. The second envelope generator produces an envelope with a slower attack. From the difference of both envelopes the VCA control voltage is derived. Positive ATTACK values emphasize attack events, negative ATTACK values smooth out the attack envelopes of sound events.

For an extensive description and explanation of the possible applications of the ATTACK control please refer to “Applications” on page 15 cont.

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SUSTAIN

With the SUSTAIN control you can amplify or attenuate the sustain of a signal by up to 24 dB. For more information on the operation of the SUSTAIN control please refer to “The SUSTAIN Control Circuitry” on page 24

The SUSTAIN control circuitry also uses two envelope generators. One follows the shape of the original curve and adapts perfectly to the dynamic gradient. The second envelope generator produces an envelope with a longer sustain. From the difference of both envelopes the VCA control voltage is derived. The gradient of the control voltage matches the time flow of the original signal.

Positive SUSTAIN values lengthen the sustain, negative SUSTAIN values shorten the sustain.

For an extensive description and explanation of the possible applications of the SUSTAIN control please refer to “Applications” on page 15 cont.

MIX

You can continuously blend between the processed and the unprocessed signal (parallel mix).

In the center position (1:1), the volume of the processed and the unprocessed signal is balanced.

Turn the MIX control to the right in order to reduce the unprocessed signal. When set hard right, you can only hear the processed signal.

Turn the MIX control to the right in order to reduce the processed signal. Hard left and you can only hear the unprocessed signal.

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OUTPUT

The OUTPUT control allows you to reduce the output signal. This ensures that following devices receive an optimized level.

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Signal-LED

The signal LED (Sig) indicates that an audio signal reaches the input with a level above -20 dB. This LED helps the operator especially in complex setups to determine immediately whether the Transient Designer TDx actually receives a signal.

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Applications

The Transient Designer TDx is ideally suited for use in professional recording, in project or home studios and sound reinforcement applications.

For the first time you can manipulate and control the attack and sustain characteristics of a signal regardless of level in the most intuitive and simple way. Usually equalizers are used to separate instruments in a mix – the tonal aspect of the signal is considered, but not the temporal aspect.

The Transient Designer TDx opens this further dimensions in signal processing. By manipulating the attack and sustain curves of a sound event, the mix can be made to sound more transparent. Instruments can be mixed at lower levels while still maintaining their positions in the mix – but occupying less space.

During a remix or in general after miking you can arrange new positions of instruments. Reduce ATTACK and increase SUSTAIN to move signals back into the mix that are too present. Additionally the FX parts of too dry signals are strengthened.

The following examples are given as suggestions and examples. The described procedures with specific instruments can of course be transfered to others which are not mentioned here.

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Drums & Percussions

Processing drum and percussion sounds is probably the Transient Designer's most typical range of application, both from samples to live drum sets:

- Emphasize the attack of a kick drum or a loop to increase the power and presence in the mix.
- Shorten the sustain period of a snare or a reverb-flag in a very musical way to obtain more transparency in the mix.
- When recording a live drum set, shorten the toms or overheads without physically damping them. Usual efforts to damp and mike are reduced remarkably. Since muffling of any drum also changes the dynamic response, the Transient Designer TDx opens up a whole new soundscape.
- Miking live drums is considerably faster and easier because you can correct the apparent 'distance' of the microphone by simply varying the ATTACK and SUSTAIN values.

Applications

- The Transient Designer TDx is a perfect alternative to noise gates in live drum miking. Adaptively reacting to the duration of the original signal, the sustain is shortened more musically than with fixed release times and a drumset is freed from any cross-talk quickly and effectively.
- Create unusual dynamic effects including new and interesting pan effects. For example, patch a mono loop through two channels of the Transient Designer TDx and pan fully left and right in the mix. Process the left channel with increased ATTACK and reduced SUSTAIN while you adjust the right channel the opposite way and you get very special stereo loop sounds. You have to try this to appreciate what it sounds like, but expect to hear a lot of unusual stereo movement.
- Enjoy an amazingly simple integration of drum sounds into a mix. If the acoustic level of a snare is expanded to approximately +4 dB by increasing the attack value, the effective increase of peak levels in the overall mix is merely about 0.5 dB to 1 dB.

Drums: Ambience

If your drums happen to sound as if the room mics have been placed in a shoe closet, the Transient Designer can immediately turn that sound into the ambience of an empty warehouse. Just send the stereo room mics through two Transient Designer TDx modules and crank the ATTACK controls to emphasize the first wave.

Now slowly increase SUSTAIN values to bring up a “all-buttons-in-1176-sound” room tone – but without pumping cymbals. For a solid and driving rhythm track just fine-tune the SUSTAIN control to make sure that the room mic envelope ends more or less exactly on the desired upbeat or downbeat.

Guitars

Use the Transient Designer TDx on guitars to soften the sound by lowering the ATTACK. Increase ATTACK for in-the-face sounds, which is very useful and works particularly well for picking guitars. Or blow life and juice into quietly played guitar parts.

Distorted guitars usually are very compressed, thus not very dynamic. Simply increase the ATTACK to get a clearer sound with more precision and better intonation despite any distortion.

Heavy distortion also leads to very long sustain. The sound tends to become mushy; simply reduce SUSTAIN to change that. If you, however, want to create soaring guitar solos that would make even David Gilmour blush, just crank up the SUSTAIN control to the max and there you go.

With miked acoustic guitars you can emphasize the room sound by turning up SUSTAIN. If you want the guitars to sound more intimate and with less ambience, simply reduce SUSTAIN.

Bass: Staccato vs. Legato

Speaking of bass: Imagine a too sluggishly played bass track. You may not have to re-record it: Reduce the SUSTAIN until you can hear clear gaps between the downbeats – the legato will turn into a nice staccato, driving the rhythm-section forward.

Backings

A common problem especially with tracks that are recorded and mixed in different studios: Backings lack of ambience, and finding a reverb that “matches” takes time. So simply emphasize the original ambience by turning up the Transient Designer’s SUSTAIN control.

And the opposite problem, too much ambience, is similarly simply solved with the opposite processing – just reduce SUSTAIN.

Keyboards & Sampler

Sounds in keyboards and samples are usually highly compressed and maintain only little of natural dynamics. Increase the ATTACK values to re-gain a more natural response characteristic. The sounds occupy less space in the mix and appear more identifiable even at lower volumes.

Post Production

When dealing with overdubs in movies you can easily add more punch and definition to effect sounds from any sample library.

The same applies to outdoor recordings that suffer from poor microphone positioning – simply optimize them afterwards.

Mastering

Like with any good thing, you also have to know where not to use it. For example, using a Transient Designer TDx in mastering is not recommended, as it is rarely a good idea to treat a whole mix at once. Instead, treat individual elements within the mix.

Differential Envelope Technology (DET)

SPL‘s DET is capable of level-independent envelope processing and thus makes any threshold settings unnecessary. Two envelopes are generated and then compared. From the difference of both envelopes the VCA control voltage is derived. The DET ensures that both low and loud signals (pianissimo to fortissimo) are treated the same way.

Both ATTACK and SUSTAIN control circuitries operate simultaneously and don‘t affect each other.

The ATTACK Control Circuitry

The ATTACK control circuitry uses two envelope generators. The first one generates a voltage (Env 1) that follows the original waveform. The second envelope generator creates the envelope Env 2 with a slower attack envelope.

Diagram 1 illustrates the original curve and the two created envelopes that control the ATTACK processing. Envelope generator Env 1 follows the original waveform. Env 2 is generated with reduced attack.

Diagram 2 shows the difference between Env 1 and Env 2 that defines the control voltage of the VCA. The shaded area marks the difference between Env 1 and Env 2 that controls the control voltage of the VCA. The amplitude of the attack is increased if positive ATTACK values are set. Negative ATTACK values reduce the level of the attack transient.

Diagram 3 displays the processed waveforms with maximum and minimal ATTACK to compare against the original waveform in diagram 1.

Diagram 1: Generated Envelopes (Attack)

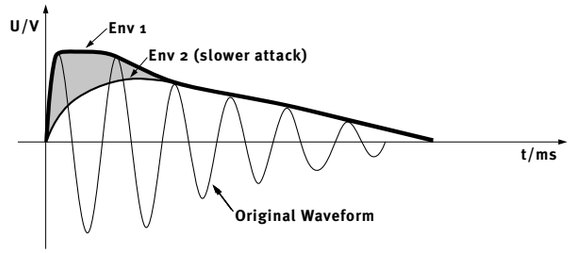


Diagram 2: Calculated Control Voltage (Attack)

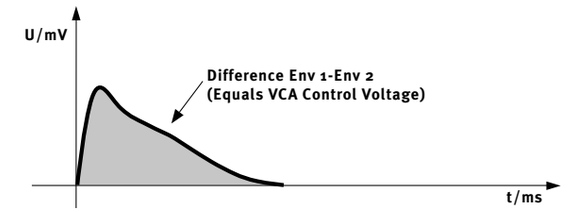
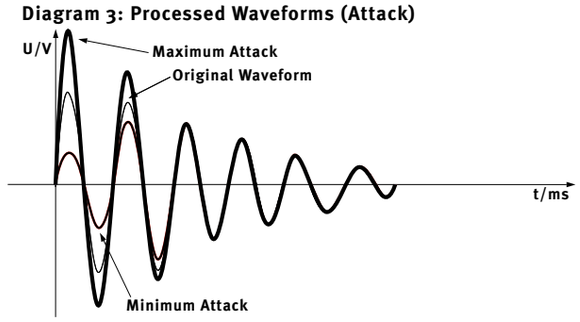


Diagram 3: Processed Waveforms (Attack)



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The SUSTAIN Control Circuitry

The SUSTAIN control circuitry also plays host to two envelope generators. The envelope tracker Env 3 again follows the original waveform. The envelope generator Env 4 maintains the level of the sustain on the peak-level over a longer period of time.

The control voltage of the VCA is again derived from the difference between the two voltages. Sustain amplitude is increased for positive SUSTAIN settings and reduced for negative settings.

Diagram 4 illustrates the original waveform and the envelope creation to control the SUSTAIN processing. Envelope generator Env 1 follows the original waveform, Env 2 is generated with prolongued sustain.

Diagram 5 shows the difference between Env 4 and Env 3 that defines the control voltage of the VCA.

Diagram 6 displays the processed waveforms with maximum and minimal sustain to compare against the original waveform in diagram 4.

Diagram 4: Generated Envelopes (Sustain)

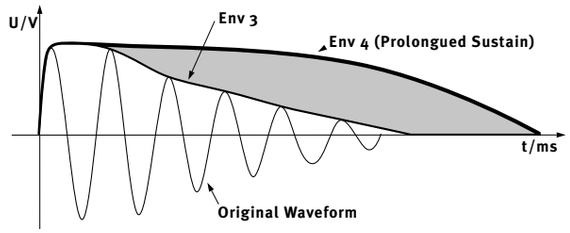


Diagram 5: Calculated Control Voltage (Sustain)

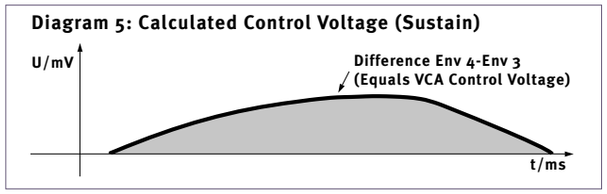
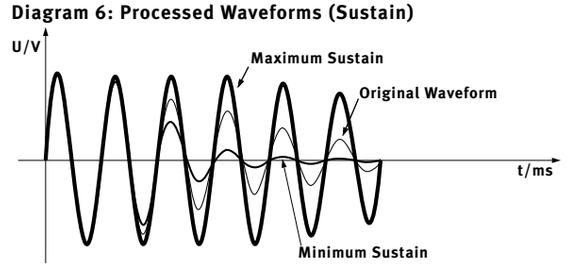


Diagram 6: Processed Waveforms (Sustain)



Content

Exclamation mark within a triangle

An exclamation mark within a triangle is intended to make you aware of important operational advice and/or warnings that must be followed.

Be especially attentive to these and always follow the advice they give.

Lightning symbol within a triangle

In this Manual a lightning symbol within a triangle warns you about the potential for dangerous electrical shocks – wich can also occur even after the device has been disconnected from a power source.

Symbol of a lamp

The symbol of a lamp directs your attention to explanations of important functions or applications.

Connections

Only use the connections as described.

Other connections can lead to health risks and damage the equipment.

Water and humidity

Do not use this device anywhere near water (for example in a bathroom, a damp cellar, near swimming pools, or similar environments). Otherwise your are dealing with an extremely high risk of fatal electrical shocks!

Insertion of objects or fluids

Be careful to not insert any object into any of the chassis openings. You can otherwise easily come into contact with dangerous voltage or cause a damaging short circuit. Never allow any fluids to be spilled or sprayed on the device. Such actions can lead to dangerous electrical shocks or fire!

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Air ventilation

Chassis openings offer ventilation and serve to protect the device from overheating. Never cover or otherwise close off these openings. Never place the device on a soft surface (carpet, sofa, etc.).

Electrical power

Operate the device only from power sources that can provide proper power. When in doubt about a source, contact your dealer or a professional electrician. To be certain you have isolated the device, disconnect all power and signal connections. Make sure that the power supply plug is always accessible. When not using the device for a longer period, make sure to unplug it from your wall power socket.

Opening the unit

Simply put: DON’T, if you are not a certified SPL technician or engineer. Really: Do not open the device housing, as there is great risk you will damage the device, or – even after being disconnected – you may receive a dangerous electrical shock.

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Power connection overloads

Avoid any kind of overload in connections to wall sockets, extension or splitter power cords, or signal inputs. Always keep manufacturer warnings and instructions in mind.

Overloads create fire hazards and risk of dangerous shocks.

Lightning

Before thunderstorms or other severe weather, disconnect the device from wall power; do not do this during a storm in order to avoid life threatening lightning strikes.

Similarly, before any severe weather, disconnect all the power connections of other devices and antenna and phone/network cables which may be interconnected so that no lightning damage or overload results from such secondary connections.

Controls and switches

Operate the controls and switches only as described in the manual. Incorrect adjustments outside safe parameters can lead to damage and unnecessary repair costs. Never use the switches or level controls to effect excessive or extreme changes.

Repairs

Unplug the unit from all power and signal connections and immediately contact a qualified technician when you think repairs are needed – or when moisture or foreign objects may accidentally have reached inside the housing, or in cases when the device may have fallen and shows any sign of having been damaged. This also applies to any situation in which the unit has not been subjected to any of these unusual circumstances but still is not functioning normally or its performance is substantially altered.

In cases of damage to the power supply and cord, first consider turning off the main circuit breaker before unplugging the power cord.

Replacement/substitute parts

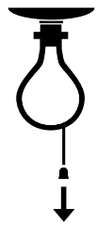
Be sure that any service technician uses original replacement parts or those with identical specifications as the originals.

Incorrectly substituted parts can lead to fire, electrical shock or other dangers, including further equipment damage.

Safety inspection

Be sure always to ask a service technician to conduct a thorough safety check and ensure that the state of the repaired device is in all respects up to factory standards.

Cleaning



Do not use any solvents, as these can damage the chassis finish.

Use a clean, dry cloth (if necessary, with an acid-free cleaning oil).

Disconnect the device from your power source before cleaning.

▶ Declaration of CE Conformity

The construction of this unit is in compliance with the standards and regulations of the European Community.

CE

▶ Notes on Environmental Protection

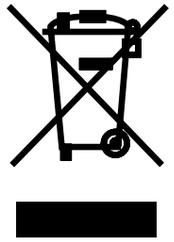
At the end of its operating life, this product must not be disposed of with regular household waste but must be returned to a collection point for the recycling of electrical and electronic equipment.

The wheelie bin symbol on the product, user's manual and packaging indicates that. The materials can be reused in accordance with their markings.

Through reuse, recycling of raw materials, or other forms of recycling of old products, you are making an important contribution to the protection of our environment.

Your local administrative office can advise you of the responsible waste disposal point.

WEEE Registration: 973 349 88



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