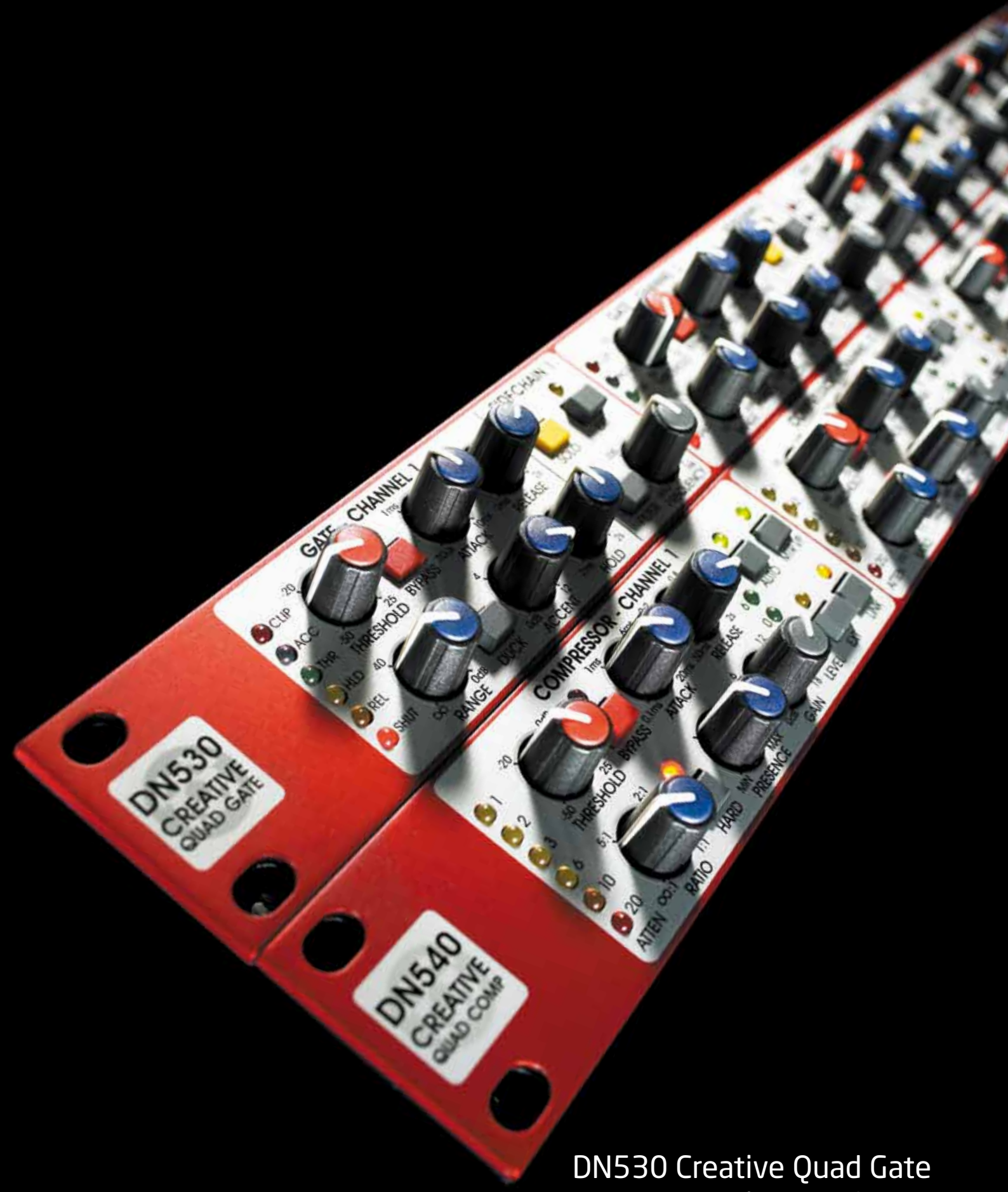


DN530 Creative Quad Gate
DN540 Creative Quad Comp

KLARK TEKNIK
SIGNAL PROCESSING BY DEFINITION

DN530 Creative Quad Gate

Introduction
With the unrelenting absorption of signal processing into digital mixing consoles, outboard gear now has to contribute something extra special merely to justify its space in the rack. The new DN530 Creative Quad Gate does just that. It brings some exciting new tools to the audio party. The DN530 features "Transient Accenting", a creative feature providing an easy way to enhance the attack envelope beyond merely opening the gate. This can provide up to 12dB of additional transient energy and its primary application is to provide additional impact on drums and percussion instruments, although it can be used to enhance the impact of many instruments, including acoustic stringed instruments such as guitar and piano.

Transient Accenting is unique in that it allows the operator precise control over the amount of enhancement applied to each channel of processing.

Gate Uses and Abuses
Gates were originally devised to reduce noise in the silent passages of music programme especially during the process of multi track recording on analogue tape.

They still get used to reduce noise but they have found many other uses and creative applications over the years

Applications include:-

- Noise reduction
- Removing compressor breathing noise
- Reducing spill from adjacent sound sources
- Gating ambience reverb for effects
- Gating one instrument to sync it with another
- Ducking one source to make room for another in a mix
- Reduction of ringing on drums
- Increasing the definition and punch of drums

Very often the process of gating produces unwanted side effects especially if the gate is not set up well or does not operate sympathetically with a particular type of source material.

These can include:-

- Chatter - when the gate is indecisive and keeps opening and closing on sustained notes
- Clicking - when the attack is set too fast or when its envelope shape is unsuitable and generates high order harmonics each time it opens
- False triggering - when the gate opens on microphone spill as well as its intended source
- Noise enhancement - when noise is removed totally, the transition from gate shut to gate open and back, modulates the background noise so much that it draws the listeners attention to the noise when it is present

Providing controls for threshold, attack, release, hold and ratio, plus good metering, will help operators set the gate up for differing signal sources and minimise most of the negative effects above. However, this may involve a degree of compromise between the desired gating effects and the unwanted side effects. The DN530 will fair better than most because design choices made during it's development were based on listening tests carefully tailored to match real world applications.

Chatter
Chatter can normally be eliminated by increasing the hold time but this may allow the gate to stay open longer than is desirable. Implementing Intelligent Threshold Shift (lowering the threshold once the gate is open) to the threshold control helps enormously and allows hold times to be reduced without signal chatter. The Intelligent Threshold Shift on the DN530 will eliminate chatter on all normal instrument types.

Clicking
The key to silent gating is the shape of the gain transition curve that is used to ramp up the signal level when the gate opens (attack) and fade it back down when the gate closes (release). Many gates use linear transitions which, when applied to low frequency signals, generate high order harmonics that sound like extra clicks (in time with the music source). The ideal shape is logarithmic (like an audio fader) so that the initial transition from shut to mostly open is fast and the final adjustment to fully open is progressively slower and slower. The exact reverse applies to the gate closing; this needs to start slowly and then speed up to close the gate fully. With these shapes no harmonics are produced during an attack, only a fundamental frequency (quarter cycle) that can be controlled by the attack time.

The tonality of the gate opening transition can be adjusted using the attack control to be slightly higher in pitch than the LF content of the sound it is processing to accentuate the start of each note; or set to be the same, in which case the transition will not be heard at all. If the attack is made slower still the start of each note will be softened which can be useful as an effect. Release times are typically much slower so audio frequency clicks are rarely heard but the log shape is still the best because it makes the fade out much less noticeable. The attack and release characteristics in the DN530 are log and fully adjustable to ensure effective gating that can be tonally transparent or used to add (or reduce) punch and definition.

False Triggering
Often microphones pick up as much spill from other instruments as they do sound from the intended source. This will cause the gate to open at times when it should be shut. Traditionally hi pass and low pass filters have been employed on the gates side chains in an attempt to limit the frequencies spectrum that will trigger the gate to open. This type of filter seldom works well in this application because they are not easily manufactured with steep enough transitions from pass band to stop band. Also set up is difficult because you typically need to adjust them together to form a band pass filter.

A much better solution is to use a band pass filter in the first place, set up with a high enough Q to make it very selective. Most instruments (especially drums) have a resonant frequency and false gate triggering can be massively improved by tuning a single band pass filter as described to find this resonance. False triggering is eliminated because the frequency spectrum and resonance from the spill does not produce enough energy at the tuned frequency, so only the intended source will open the gate.

The DN530 side chain filters are a high Q band pass types as described above. Set up is made by a simple single control (per channel) and this is made even easier because you can listen to the filter output (without interrupting the source material) on a separate solo bus.

Noise Enhancement
We all have the ability to naturally block out constant back ground noises. Using a gate to eliminate background noises totally defeats this mechanism; drawing our attention to the noise when the gate opens. Typically, adjusting the gate range down to 10 or 15dB produces much more natural sounding results.

Unique To DN530: Transient Accenting
Many instruments have a percussive start to notes that are played. These transients can be enhanced or reduced by careful adjustment of the attack time. Additionally the DN530 has the ability to accentuate this transition even more through application of its Transient Accenting capabilities.

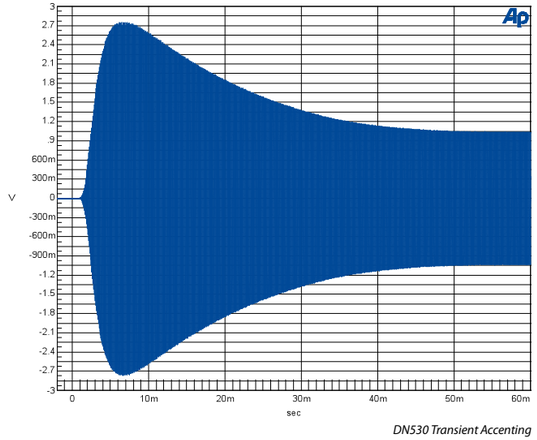
Every time the gate opens an accent can be applied. This is a controlled boost in the signal level, the amplitude of which is set by the operator, which lasts approximately 30ms. The amount of boost applied is determined (in dB) by the accent control and speed at which it is applied is determined (in ms) by the attack control. The boost is gradually removed during the 30ms accent period returning the signal level to normal.

If the gate is being used creatively the effect of the gate opening transition can be accentuated, which is particularly useful on drums improving definition and punch.

The accent effect is totally independent of the range control so it is possible to reduce the range very low or even off (0dB) and still achieve creative enhancement of transients.

The Transient Accenting feature contained in the DN530 adds another tool for the sound engineer, which can be used to enhance and compliment the dynamic content of instruments, particularly drums and percussion, as well as to augment the gating process for many types of sound source.

The diagram shows the DN530's Transient Enhancement function applied to a wide band noise burst. The signal amplitude has reduced to normal after 50ms. Prior to this, the increase in energy created by the DN530's accent processing can clearly be seen.



DN530 Transient Accenting

Some benefits from Transient Accenting are listed below:-

- Increased tonal shaping effectiveness – gates can be used to modify the leading edge of percussive sounds to add definition and punch. This effect can be massively increased by accenting if required.
- Reduction of gated breathing – the noise enhancement issues associated with gating background noise can be reduced or totally eliminated while retaining the tonal shaping and punch that a gate can add to percussive sounds.
- Reduction of delay – when gates are used to re-shape the transient start of a sound they remove a small amount of sound at the start. This effectively causes a slight delay. Digital gates can capture this sound by using look ahead techniques but they are not time machines; the way they work is to delay the signal until the gate has opened. This eliminates any losses from the transient but delays the signal even further. Using Transient Accenting with the gate range at minimum (0dB) ensures absolutely no sound is lost and no delay is introduced; however controlled accenting of the transient is still possible.
- Reduction of resonant howl round – with high amplification levels it is possible for a drum to resonate in sympathy with the amplified version of itself, similar to microphonic howl round. It is possible for this sound to be so loud that once open a gate will not shut again. If the sound levels are reduced and the drum transients are accentuated the possibility of howl round is substantially reduced. The Transient Accenting only lasts for 30ms so any risk of resonant build up is restricted to this time period only.

DN540 Creative Quad Compressor

Introduction
Compressors were originally devised to reduce the dynamic range of audio signals. To do this they use gain modification that makes adjustments to signal levels automatically, dependant on the level and dynamic of the signal itself and upon the character and control settings of the particular compressor unit.

Throughout the history of dynamics processing many different types of compressor have been produced using many different types of gain technology. Each type has a distinctive sound. Users have found many applications which benefit from these often unintentional compression audio artefacts, taking the use of compressors far beyond simple dynamic range reduction, sometimes even generating the complete reverse; Dynamic Enhancement. It is with these creative applications in mind, that the DN540 has been designed to offer a latency-free, comprehensive and compact dynamics processing package.

Applications include:-

- Protecting signal paths from amplitude overload
- Improving the apparent power of signals when an artists' performance is a little too dynamic
- Maintaining a stable signal level to help an instrument sit within a mix
- Changing the percussive timbre of an instrument to enhance impact
- Compressing a mix so that it maintains a stable signal level (typically to make it sound louder)
- Changing the percussive timbre of a mix to make it sound fuller and to enhance impact
- Frequency conscious compression to remove unwanted sibilance or undesired tonal artefacts

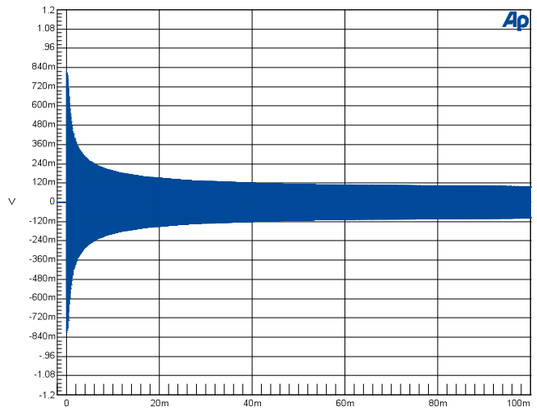
Compressor Uses and Abuses
Very often the process of compression produces audible side effects, especially if the compressor chosen does not match the application.

These can include:-

- Breathing - when high frequency environmental or processing noise levels jump up and down sounding similar to someone breathing in the background
- Pumping - when level modulation can be heard
- Amplitude flutter - a faster oscillating modulation that makes programme sound "gritty"
- Source inter-modulation - when one sound source within a mix causes amplitude changes to another; for example the natural decay of cymbals can be modulated by the crack of a snare drum in a drum mix
- Transient distortion - unwanted clicks at the start of a sound
- Dull sound, lacking in detail and intelligibility - when all the natural attack and brilliance is stripped away from the sound source

Providing controls for threshold, attack, release, ratio, and clear, responsive metering can go a long way toward helping with suitable parameter set up for any signal source so that most of the negative effects of compression can be reduced or eliminated. However, this is a complex and critical task which often involves a degree of compromise between the desired compression effects and unwanted compression artefacts. This can be tedious and sometimes unachievable within the time constraints of live sound events.

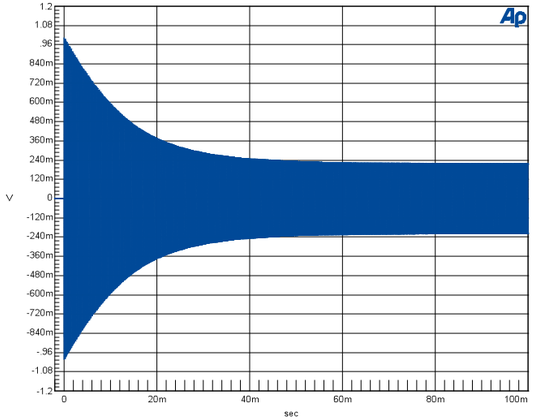
Automatic Compression (DN540 in Automatic mode)
For many every day compression applications an RMS (Root Mean Square) compressor with automatic time constants (attack and release) is the best solution, providing quick and easy set up. The RMS averaging process slows the compression time constants on relatively steady state signals reducing distortion and pumping; and when large signal changes occur they automatically speed up capturing and constraining the bulk of any large sound level variations. Most modern solid-state compressors operate on this principle. Very often a Ratio control and Threshold control combined with the automatic time constant adjustment, just described, is all you need to set up good sounding compression. The DN540 in auto mode operates in exactly this way, providing simple fast set up for straight forward compression requirements.



DN540 in Manual Mode showing linear attack

Advanced Compression (DN540 in Manual mode)
RMS compressors are not fast enough to capture everything on transient material because the RMS averaging process takes time to respond, thus they are not suitable for ultimate protection against system overloads etc. Also, their creative use to tailor percussive instruments is very threshold dependant and often results in attack profiles that are either too fast or too slow for the desired effect - unless the sound source is extremely regular, which is not typical with many musicians.

For more demanding compression duties a compressor with fully adjustable attack and release is a better choice. With this style of compressor there is no RMS averaging process delay, so the action of attack or release can start the instant there is a change in signal amplitude that requires it. The user must define the rate of response and can adjust this precisely to match the sonic effect required on the source material. Normally this also results in high distortion on constant signal levels because the compressor attacks and releases on every cycle but advanced compressors utilise windowing methods whereby the time constants set are greatly increased on steady state material.



DN540 in Manual Mode showing linear attack

Linear attack provides a constant rate of attack (in dB against time) such that large changes in programme signal level take a little longer to compress than smaller ones. However, on material with more constant signal levels the attack rate of the DN540 "normal mode" compressor automatically reduces. This appears as a curvature in the linear attack rate characteristic as it nears completion, hence the term semi-linear.

This makes the compression very transparent providing some dynamic control but without unduly effecting the intentional dynamic content of the source material.

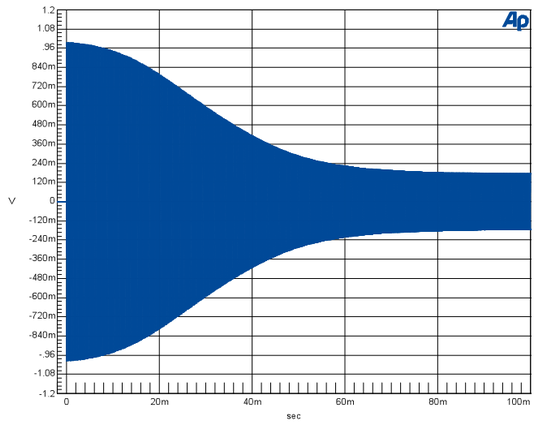
It can be used on difficult instruments like acoustic guitar with slower attack time settings and relatively fast release to keep equal perceived loudness within a mix without producing excessive amplitude flutter or distortion.

It can also be used with faster attack times to capture dynamic instruments like electric bass guitar without adding excessive distortion on constantly compressed passages.

Soft Knee Compression
Adding "soft knee" noticeably delays the onset of attacks, which can be particularly useful on drums where compression can be applied to emphasise transients giving more impact while retaining a good deal of artistic dynamic content from the drummer.

Many vintage compressors exhibit a soft knee gain transition. This normally occurs because of non linear "errors" in the gain envelope. Modern compressors normally have much better gain envelope linearity, so any soft knee has to be generated in a separate process that operates outside the gain envelope.

The DN540 soft knee generation is set up so that it does effect the gain envelope like vintage compressors. This means it bends the compression ratio at the onset of compression as you would expect but it also bends the attack and release character too. This provides very natural sounding compression as found on many vintage devices and generates more full bodied punch and definition when attack times are deliberately set very slow.



DN540 in "Soft Knee" Mode showing anti-log (slow) attack

Unique To DN540: Dynamic Enhancement
Many instruments have a percussive start to their audio characteristics. These initial transients contain the bulk of the signal harmonics that we use to distinguish one instrument from another. Without this initial attack most instruments sound quite similar - and very dull! Unfortunately this is what tends to happens on compressed sound sources. This is because compressors capture much of the percussive start and reduce it in level more than they reduce the remainder of the envelope. It's not as extreme as totally removing the start of a note, but it still strips much of the harmonic content and removes detail and intelligibility from the programme.

This can be addressed by using equalisation to boost the upper frequencies in an attempt to "recover" the harmonic content, but this is dangerous in sound

reinforcement because when the instrument is silent and the compressor relaxes there is no gain reduction; but the upper frequency boost remains, increasing noise and making microphonic feedback much more likely.

The Dynamic Enhancement in the DN540 was developed to correct for the loss of detail and intelligibility during the compression process, but without changing the tonality of uncompressed programme. It works by reducing the ratio of the compressor in a range of frequencies critical to harmonic content, and the effect is continuously variable so as much enhancement can be added as needed or to suite personal preference.

When Dynamic Enhancement is used, the harmonic content of the material is preserved in a more natural and dynamic state, in a spectral area where we are most perceptive to detail. This allows more compression to be applied, providing greater control of programme dynamics, without the source material sounding dull, lacking in detail and unnatural.

Dynamically enhanced compression can produce results that are very similar to multiband compression but with only one additional control required (as opposed to many) it is considerably less time consuming to set up and typically does not require constant tweaking during a performance .

Some additional corrective benefits from Dynamic Enhancement are as follows:-

- Reduction of source inter-modulation – it is very common for the pop/rock singers in to stand in front of drum kits and unless suitable screens are placed between them there will be a lot of spill from the kit. Often you can hear the compressor on the vocalist modulating the spill from cymbals which sounds very unnatural. This can be eliminated by using the Dynamic Enhancement to stabilise the higher frequencies and if that makes the vocals sound too bright the high frequencies can be reduced little using EQ, reducing the spill and reducing the chances of high frequency howl round.
- Reduction of breathing – most processing noise occurs in the presence band and it is much more noticeable when it is modulated by the compression of a sound source. Dynamic Enhancement can eliminate this effect.
- Reduction of pumping – because human hearing is so sensitive to presence band frequencies, stabilising their amplitude with Dynamic Enhancement can mask the pumping effects at lower frequencies.
- Reduction of dull sound and increased brilliance – it is often tempting to boost high frequencies to get sounds to cut through a mix but in sound reinforcement this increases the likelihood of howl round. Dynamic Enhancement can help increase the brilliance of compressed sounds by correcting their tendency to sound dull and with increased use it can be used creatively to add even more high frequency energy without increasing the risk of howl round.

The Dynamic Enhancement feature contained in the DN540 adds another tool for the sound engineer that can be used to enhance and compliment the application of compression as a creative process.

DN530 Creative Quad Gate

DN540 Creative Quad Comp

DN530 Architect's & Engineer's Specification

The Noise Gate shall provide four (4) complete channels of creative transient-accentuating gating in a standard 1U 19" rack mount chassis. Each channel shall have an electronically-balanced input and output on 3-pin XLR connectors.

Each channel shall have a rotary Threshold control to set the signal level at which the Noise Gate opens. The channel metering shall have a green "THR" LED to indicate when the signal exceeds this threshold.

Each channel shall have rotary controls for setting the Attack, Hold and Release times of the Noise Gate. The channel metering shall have a yellow "HLD" LED to indicate when the Hold portion of the dynamic control envelope is active and an orange "REL" LED to indicate when the release portion of the dynamic control envelope is active. The Hold function shall also have Intelligent Threshold Shift (i-TS) to provide threshold hysteresis to avoid repeated opening and closing of the Noise Gate in response to low frequency signals close to the threshold level set by the user.

Each channel shall have an Accent rotary control to accentuate the initial transient that opens the Noise Gate by adding an overshoot characteristic with up to +12 dB of gain as the Noise Gate opens. The channel metering shall have a blue "ACC" LED to indicate when the Accent function is adding gain to the initial transient. The Accent shall also function independently of the noise gate when the range control is set to 0dB.

Each channel shall have a latching pushbutton switch with an associated orange LED labelled "DUCK" to reverses the operation of the gate so that it closes when signals exceed the threshold set by the user and opens when they go fall below the set threshold. When the Duck function is active, the Accent rotary control and "ACC" LED shall be disabled.

Each channel shall have a rotary Range control to adjust the amount of gain reduction applied to signals below the threshold level. Each channel shall also have a red "SHUT" LED to indicate when the Noise Gate is fully closed.

Each channel shall have a latching pushbutton switch with an associated red LED labelled "BYPASS" to remove the Noise Gate from the signal path.

Each channel shall have a Clip LED included in the channel metering to indicate when the input signal is exceeding the clipping point of the Noise Gate.

Each channel shall also have a sidechain control section with a bandpass filter controlled with a rotary control labelled Frequency to set the filter centre frequency. The sidechain control section shall have a latching pushbutton switch with an associated green LED labelled "FILTER" to put the bandpass filter in the sidechain signal path. The sidechain control section shall also have a latching pushbutton switch with an associated yellow LED labelled "EXT" to select the external sidechain ¼" TRS Jack input as the signal source for the sidechain instead of the signal that the Noise Gate is acting on.

The Noise Gate shall have a Solo Bus to allow monitoring of the sidechain control input signals for each channels. The Solo Bus shall have input and output XLR connectors on the rear panel to facilitate the serial connection of units and to connect to a line input on a mixing console for monitoring via its Solo Bus console headphone amp.

The sidechain control section of each channel shall have a latching pushbutton switch with an associated yellow LED labelled Solo to enable the post-filter sidechain signal onto the Noise Gate solo bus.

The Noise Gate shall meet or exceed the following specifications:

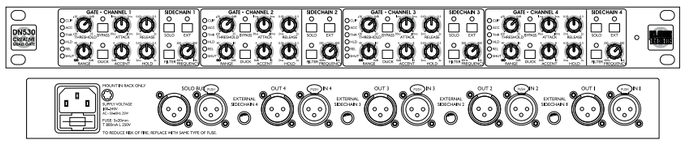
Distortion:	0.05% (1kHz 0dBu)
Dynamic range:	116dB (20Hz-20kHz unweighted)
Frequency:	±0.5dB (20Hz-20kHz, relative to 1kHz)
Noise floor:	-100dBu gate closed (20Hz-20kHz unweighted) -94dBu gate open (20Hz-20kHz unweighted)
Attack time:	30us-10ms
Hold/Release time:	2ms-2 secs
Max output level:	+22dBu into 600 ohms

The Noise Gate shall have an integral switch-mode power supply capable of operating from a 100 – 240 V a.c. ±10%, 50 to 60 Hz AC power source and have an IEC 60320 C14 mains inlet with integral fuse. A blue LED labelled "POWER" shall be included on the front panel to indicate when the unit is powered on.

The Noise Gate shall be the Klark Teknik Model DN530 and no alternative specification option is available.

Inputs	**Four**	**Gate**	
Type	Analogue, electronically balanced female XLRs (Pin 2 hot)	Threshold	-50dB to +25dB
Impedance	10k ohms	Range	-4 (minus infinity) to 0dB
Maximum input level	+22dBu	Attack	30µs to 10ms
Common mode rejection	Typically, -80dB at 1kHz	Release	2ms to 2s
		Hold	2ms to 2s
Outputs	**Four**	Accent	0dB to +12dB
Type	Analogue, electronically balanced male XLRs (Pin 2 hot)	**Filter**	
Output impedance	<60 ohms	Sidechain filter	40Hz to 16kHz
Maximum output level	+22dBu	**Terminations**	
Signal drive capability	<600 ohms	Audio	3-pin XLRs (male and female) and 1/4" TRS balanced jack sockets
EXT SIDECHAIN inputs	**Four**	Power	3-pin IEC
Type	Analogue, electronically balanced Jack sockets		
Impedance	20k ohms	**Power requirements**	
Maximum input level	+22dBu	Voltage	100VAC to 240VAC ±10%
Common mode rejection	Typically -60dB at 1kHz	Frequency	50Hz to 60Hz
		Consumption	<25W
SOLO BUS input	**One**	**Dimensions**	
Type	Analogue, electronically balanced female XLR (pin 2 hot)	Height	44.5 mm (1.75"), 1U high
Input impedance	20k ohms	Width	483 mm (19")
Maximum input level	+22dBu	Depth	305 mm (12")
Common mode rejection	Typically -60dB at 1kHz	**Weight**	
		Net	4.6 kg
SOLO BUS output	**One**	Shipping	5.6 kg
Type	Analogue, electronically balanced male XLR (pin 2 hot)	**Operation**	
Output impedance	<60 ohms	Temperature	+5°C to +40°C
Maximum output level	+22dBu	**Storage**	
Signal drive capability	<600 ohms	Temperature	-20°C to +60°C
Performance			
Max gate gain reduction	< -90dB		
Max accent gain	+12dB		
Max signal level any input or output	+22dBu		
Noise at main output with unity gain	-94dBu		
Distortion at 1KHz 0dBu with steady unity gain condition	< 0.05%		
Signal delay	0 seconds		
Frequency response	±0.5dBu (input to output), 20Hz to 20kHz		
Dynamic range	>116dB (22Hz to 22kHz unweighted)		

Due to a policy of continual improvement, Klark Teknik reserves the right to alter the function or specification at any time without notice.



DN540 Architect's & Engineer's Specification

The Compressor shall provide four (4) complete channels of creative presence-accentuating compression in a standard 1U 19" rack mount chassis. Each channel shall have an electronically-balanced input and output on 3-pin XLR connectors.

Each channel shall have a rotary Threshold control to set the signal level at which the Compressor applies compression and a rotary Ratio control to set the amount of compression applied above the set threshold.

Each channel shall have rotary controls for setting the Attack and Release times of the Compressor. Each channel shall have a latching pushbutton switch with an associated green LED labelled "AUTO" to select rms-sensing Auto compression mode instead of the default peak-sensing Manual compression mode. In Auto compression mode the Attack and Release rotary controls shall be disabled.

Each channel shall have a rotary Presence control to dynamically accentuate a broad range of frequencies centred around 5 kHz. The purpose of this function shall be to allow high-mid frequency content often lost when compression is applied to be retained.

Each channel shall have a rotary Gain control to apply make-up gain to the Compressor.

Each channel shall have a latching pushbutton switch with an associated orange LED labelled "HARD" to change the compression characteristic from the default soft knee setting to a hard knee setting.

Each channel shall have a latching pushbutton switch with an associated red LED labelled "BYPASS" to remove the Compressor from the signal path.

Each channel shall have a six (6) segment attenuation meter to show the amount of gain reduction being applied by the Compressor.

Each channel shall have a six (6) segment signal level meter which by default shall show the compressor output signal level. A latching pushbutton switch shall be included on each channel with a green LED labelled "MTR I/P" to select input level metering instead.

Each channel shall have a latching pushbutton switch with an associated yellow LED labelled "EXT" to select the external sidechain ¼"TRS Jack input as the signal source for the Compressor sidechain instead of the signal that the Compressor is acting on.

The Compressor shall have a channel link facility whereby adjacent channels can have their sidechains summed with the left-handmost channel acting as the master control. Channels 1-3 shall have a latching pushbutton switch with an associated yellow LED labelled "LINK" to allow linking to the adjacent right-hand channel. The presence and gain controls shall remain independent when the channel linking facility is enabled.

The Compressor shall meet or exceed the following specifications:

Distortion:	0.05% (1kHz 0dBu)
Dynamic range:	116dB (20Hz-20kHz unweighted)
Frequency response:	±0.5dB (20Hz-20kHz relative to 1kHz)
Noise floor:	-94dBu (20Hz-20kHz unweighted)
Attack time:	0.1ms-20ms
Release time:	50ms-2 secs
Maximum output level:	+22dBu into 600 ohms

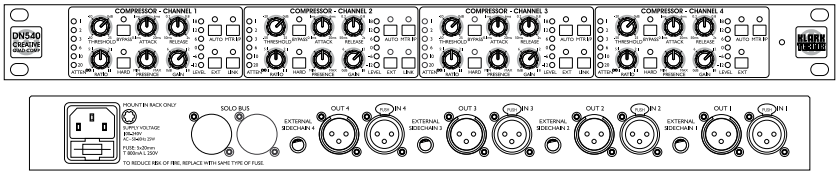
The Compressor shall have an integral switch-mode power supply capable of operating from a 100 – 240 V a.c. ±10%, 50 to 60 Hz AC power source and have an IEC 60320 C14 mains inlet with integral fuse. A blue LED labelled "POWER" shall be included on the front panel to indicate when the unit is powered on.

The Compressor shall be the Klark Teknik Model DN540 and no alternative specification option is available.

Inputs	**Four**
Type	Analogue, electronically balanced female XLRs (Pin 2 hot)
Impedance	10k Ohms
Maximum input level	+22dBu
Common mode rejection	Typically, -80dB at 1kHz
Outputs	**Four**
Type	Analogue, electronically balanced male XLRs (Pin 2 hot)
Signal drive capability	<600 ohms
Output impedance	<60 ohms
Maximum output level	+22dBu
EXT inputs	**Four**
Type	Analogue, electronically balanced Jack sockets
Impedance	20k ohms
Maximum input level	+22dBu
Common mode rejection	Typically -60dB at 1kHz
Performance	
Maximum signal level any input or output	+22dBu
Frequency response	±0.5dBu (input to output), 20Hz to 20kHz
Dynamic range	>116dB (22Hz to 22kHz unweighted)
Noise at main output with unity gain	-94dBu
Distortion at 1kHz 0dBu with steady unity gain condition	<0.05%
Signal delay	0 seconds

Compressor	
Threshold scale	-50dB to +25dB
Ratio scale	Minus infinity (-4):1 to 1:1
Attack scale	0.1s to 20ms
Release scale	50ms to 2s
Presence scale	Minimum (flat) to maximum (-3dB at 5kHz)
Gain scale	0dB to 18dB
Terminations	
Audio	3-pin XLRs (male and female) and 1/4" TRS balanced Jack sockets
Power	3-pin IEC
Power Requirements	
Voltage	100VAC to 240VAC ±10%
Frequency	50Hz to 60Hz
Consumption	<25W
Dimensions	
Height	44.5 mm (1.75"), 1U high
Width	483 mm (19")
Depth	305 mm (12")
Weight	
Net	4.6 kg
Shipping	5.6 kg
Operation	
Temperature	+5°C to +40°C
Storage	
Temperature	-20°C to +60°C

Due to a policy of continual improvement, Klark Teknik reserves the right to alter the function or specification at any time without notice.



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