



square
one



KLARKTEKNIK

The Square ONE range has been conceived by Klark Teknik to offer audio professionals a range of easily accessible, high-performance audio equipment, which combine no-compromise sonic quality with a feature set containing all the essentials.

Square ONE processors represent the very best of British design and engineering, combined with modern, efficient manufacturing methods, backed by an industry-leading 3-year warranty. Your Square ONE processor will give you the tools you need for professional results, and many years of reliable service.



square one dynamics

The constantly-changing hardware requirements of technical riders are just one of the many issues audio rental companies and live music venues have to deal with. Having to retain a comprehensive inventory of different devices, as well as reconfiguring outboard processing racks is a costly, time-consuming task, further complicated by the number of hardware options available. The solution: Klark Teknik Square ONE Dynamics.

Eight channels of flexible, configurable, high-performance dynamics processing in one 3U package. The right brand, the right combination, the right investment, every time.

Features

Default Compressor (RMS sensing type)
With both mode switches inactive the compressor behaves in the default Soft Knee and RMS mode. This gives the slowest (and most subtle) feel to the compressor envelopes. The soft knee curvature combines with the adaptive RMS attack and release times to produce gentle envelope curvatures that are ideal for compressing sung vocals but which can still be aggressive enough to limit transients when needed. The knee curvature also reduces the adaptive nature of the RMS detection slightly, providing a little more manual control of the envelope timings than is the case below.

When Hard Knee is activated the compressor operates in a more clinical way with a more defined transition between under threshold and over threshold; this is

better suited to limiting style compression. A small amount of soft knee is still retained keeping the sound reasonably natural but no modification of the envelope occurs. This means that attacks are more aggressive, but it also allows the adaptive nature of the RMS detection to operate to its fullest extent. This mode is good for natural sounding limiting of speech.

“Vintage” Compressor (Peak sensing type)
When Hard Knee and Vintage are activated the compressor operates with more precise envelope control and a defined transition between under and over threshold. This mode uses faster peak sensing (not RMS) like many older compressor designs with exponential attack and release. This produces aggressive compression that gives good fast control, and/or limiting, of extremely dynamic material. It can also be used to add colour to low frequency signals making it ideal for controlling instruments like bass guitar.

When Vintage is active alone, the compressor employs a dual time constant, linear attack profile. The soft knee blurring of threshold occurs, (as in RMS mode), however, the effect is greatly accentuated and this produces extremely subtle attack and release curves during the onset of compression that are largely independent of the envelope control settings. As the compressor is driven harder (i.e. signals further over threshold) the soft knee effect reduces, gradually returning manual control of the attack and release times to optimise capture of larger transients etc. Thus, like the RMS modes, this compressor mode is very adaptive making set up of the envelope controls relatively easy. The peak sensing, however, increases harmonic overtones, which add a “vintage” brightness and sparkle to the programme, producing extremely transparent, lively sounding compression of acoustic instruments.

Broadband frequency-conscious compressor
Setup as per compressor, in either RMS or “VINTAGE” modes. Activate FILTER in wide mode, sweep to desired frequency and apply frequency-dependant compression as required

Hi-Q frequency-conscious compressor (De-esser)
Setup as per compressor, in either RMS or “VINTAGE” modes. Activate FILTER in NARROW mode, sweep to desired frequency and apply frequency-dependant compression as required. Excellent for reducing sibilance or other undesirable artefacts from vocals, or for removing specific resonances from instruments or programme material.

Limiters
Set compressor to “VINTAGE” (peak) mode, hard knee, fastest ATTACK, with the RATIO at infinity to one. Adjust RELEASE to suit programme. Set THRESHOLD for onset of process.

Gate
Switch to “GATE” mode, set THRESHOLD, ATTACK, HOLD, and RELEASE times to suit programme, set attenuation depth using “RANGE” control. Use SIDECHAIN

FILTER to “tune” the gate to open at selected frequency - “wide” or “NARROW” modes. The attack characteristic of the gate is exponential. This ensures that, even at extremely fast attack settings, the attack envelope seamlessly blends into the audio waveform, ensuring that undesirable audio artefacts are minimised.

i-TS (intelligent threshold shift)
This operates in conjunction with the gate hold function, to reduce chattering within the gate. Chattering is the undesirable condition that occurs when signals (especially low frequency ones) are very close to the gate threshold. In this situation the gate can become indecisive and repeatedly open and shut on the programme. i-TS ensures that the gate remains open by automatically adjusting the threshold downwards the moment the signal goes over the threshold setting. When the signal eventually falls below the (new) temporarily adjusted threshold, the i-TS re-sets, ready for the next gate opening. This hysteresis means more decisive operation of the gate, ensuring that gating is rock solid. Attacks start instantly and consistently, even on signals that are only slightly over threshold.

Stereo and multiple-channel operation
Channels can be linked (in all modes) for stereo, or multi-channel operation. When any number of channels are linked, the linked channels all adopt the mode of the left-hand channel of the linked group. This channel's settings now control all the members of that group, only the make-up gain and Side chain filter are independent.

Solo Buss
Monitor the sidechain filter during the performance, using the dedicated SOLO OUTPUT. Connect the SOLO OUTPUT to a spare input channel, line return, FX return, etc. on your mixing console. Any SOLO button press will route that processors' SIDECHAIN MONITOR to the SOLO OUTPUT, allowing monitoring of the sidechain filter without interrupting the audio output of the processor.

If the SOLO IN PLACE mode is active, the SOLO IN PLACE LED will illuminate. In this mode the SIDECHAIN MONITOR signal will replace the audio output when the SOLO button is pressed.

Metering
When mixing live sound, it is essential to be able to see at-a-glance, how the outboard processing is performing. Therefore, each channel of the Square ONE Dynamics features a 6-segment 3-colour input meter, and a 10-segment attenuation depth meter. The attenuation depth meter operates in both compressor and gate modes. The use of vertically oriented high-intensity LEDs makes for easy peripheral-vision awareness of each channel's status.



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dynamics



Architects and Engineers Specification.

The Dynamics Processor shall provide eight complete channels of either compression or gating, with push button selection and LED status indication of operational mode on an individual channel basis.

The compressor section on each channel shall provide for adjustment of Threshold, Make-Up Gain, Attack and Release times and Ratio. There shall be push button selection of RMS or Vintage Emulation (Peak) response and push button selection of Soft or Hard knee mode on each channel.

The gate section on each channel shall provide for adjustment of Threshold, Attack, Hold and Release times and Range.

The Threshold, Attack and Release controls shall be operable by the same rotary control knobs in compression and gating modes. Control of Ratio and Range shall be performed using the same rotary control knob. There shall be individual rotary control knobs for Make-Up Gain and Hold.

Each channel shall have a six-segment input level meter and a ten-segment attenuation depth meter, which will show the gain reduction being applied in both compression and gating modes.

Each channel shall have a sidechain band-pass filter with a rotary control knob for frequency control and shall be enabled by a push button switch. The band-pass filter shall have two different bandwidth settings, selectable by a push button switch. There shall be provision for an external sidechain input selected by the External Key switch with LED status indication.

The Bypass switch shall set the signal path to unity gain on each channel and provide LED status.

Each channel shall have a Solo switch with LED status indication that sends the sidechain signal to the Solo Bus Output connector.

A Solo Bus Input connector shall allow multiple Dynamics units to be chained together to form a common Solo Bus Output.

The Side Chain Solo In Place switch shall have LED status indication and change the

function of each Solo switch; when selected the sidechain signal shall be sent to the channel output connector instead of the Solo Bus Output.

The Dynamics Processor shall have the ability to link the operation of any number of adjacent channels, which shall all be summed into the sidechain of the left-hand linked channel which shall control the gain of each of the linked channels. The selection of either compression or gating for the left-hand linked channel shall override the push button settings for all channels linked to it.

A Power On Led shall be provided.

The Dynamics Processor shall meet or exceed the following specifications:

Distortion
(THD+N) <0.02% @1kHz, +4dBu

Frequency response
±0.5dB (20Hz-20kHz)

Dynamic Range
(20Hz-20kHz unweighted) >117dB

Each channel shall have XLR connectors for the input and output and a 1/4" TRS jack socket for the external side chain input. All audio connections shall be electronically balanced.

The Dynamics Processor shall be 19" standard rack mountable and 3U high.

The Dynamics Processor shall be capable of operating from a 100-240V ±10% 50/60Hz a.c. power source.

The Dynamics Processor shall be the Klark Teknik Square ONE Dynamics, and no alternative specification option is available.

Technical Specification

Dynamics Inputs
Type
Impedance (Ω)

Eight
Electronically balanced XLR (pin 2 hot)
10k

Ext Key Inputs
Type
Impedance (Ω)

Eight
Electronically balanced TRS Jack (Tip hot)
20k

Solo Bus Input
Type
Impedance (Ω)

One
Electronically balanced XLR (pin 2 hot)
20k

Dynamics Outputs
Solo Bus Output
Type
Minimum load impedance
Source impedance
Maximum level

Eight
One
Electronically balanced XLR (pin 2 hot)
600Ω
<60Ω
+22dBu into >2kΩ

Performance
Frequency response
Distortion (THD+N)
Noise Floor
Dynamic range
Compressor
Threshold (Hard Knee)
Gain
Attack
Release
Ratio

20Hz – 20kHz ±0.5dBu
<0.02% @ 1kHz, +4dBu
<-95dBu @ Unity Gain
(20Hz-20kHz unweighted) >117dB
-50dB to +25dBu
0dB to +30dB
100us to 20ms
50ms to 2.5s
∞ to 1:1

Gate
Threshold
Attack
Release
Hold
Range

-50dB to +25dBu
10µs to 10ms
2ms to 2s
2ms to 2s
∞ to 0dB

Sidechain Band pass filter
Frequency Range
Slope (Wide)

40Hz -16kHz
6dB per Octave

Terminations
Audio
Power

3-pin XLR and 1/4" TRS jack
3-pin IEC

Power Requirements
Voltage
Consumption


100V-240V a.c. ±10%
<35W

Dimensions
Height
Width
Depth

133mm (5.25 inch) – 3U High
482mm (19 inch)
205mm (8 inch)

Weight
Nett
Shipping

4.4kg
5.4kg



square one graphic

Klark Teknik has been designing audio equalisers since 1975, and has an impressive back catalogue, which includes the DN27, DN360 and DN370 three of the industry's finest and longest-established designs.

The Square ONE Graphic represents 30-years of Klark Teknik's design expertise, offered at a more accessible price point, bringing superb audio performance within reach of the most budget sensitive applications.

Features

45mm faders with integral dust guards

Long-throw faders for maximum accuracy and resolution.

Signal present and Clip LEDs

Maximum input capability of +22dBu.

Universal Power Supply

Auto voltage-sensing, operates anywhere between 100-240V \pm 10%.

Fully balanced inputs and Outputs

XLR and TRS connectors, both feature extremely high CMRR.

Relay activated bypass

Continues to pass audio in the event of power failure.

Roadworthy 3U steel chassis

Designed to withstand the rigours of the road.

PROportional Q filters

The "Q" or bandwidth of the Square ONE's filters is proportional to the gain applied, and so gives increasing focus on real problem frequencies. This also means that adjacent filters sum together with minimum phase error, providing smooth, ripple-free summation.

This filter mapping is also implemented on the World-leading Klark Teknik DN370, and is the most appropriate for live sound reinforcement.

High Pass Filters

The HPF on graphic equalisers are used to remove unwanted subsonic frequencies (traditionally about 30Hz). The HPF on the Square ONE Graphic is set at 80Hz. If using your Square ONE Graphic with a large speaker system, then you will almost certainly be using an active crossover, which should provide appropriate subsonic protection. In this case, leave the HPF out of circuit.

When using more compact loudspeakers, use the 80Hz. knee of the Square ONE HPF for maximising their headroom and efficiency (If using your Square ONE Graphic with foldback loudspeakers which have an extended bass response, the HPF can still be used, in fact, useful results can be obtained by "bending" the knee of the HPF, by boosting the 63Hz fader on the graphic).

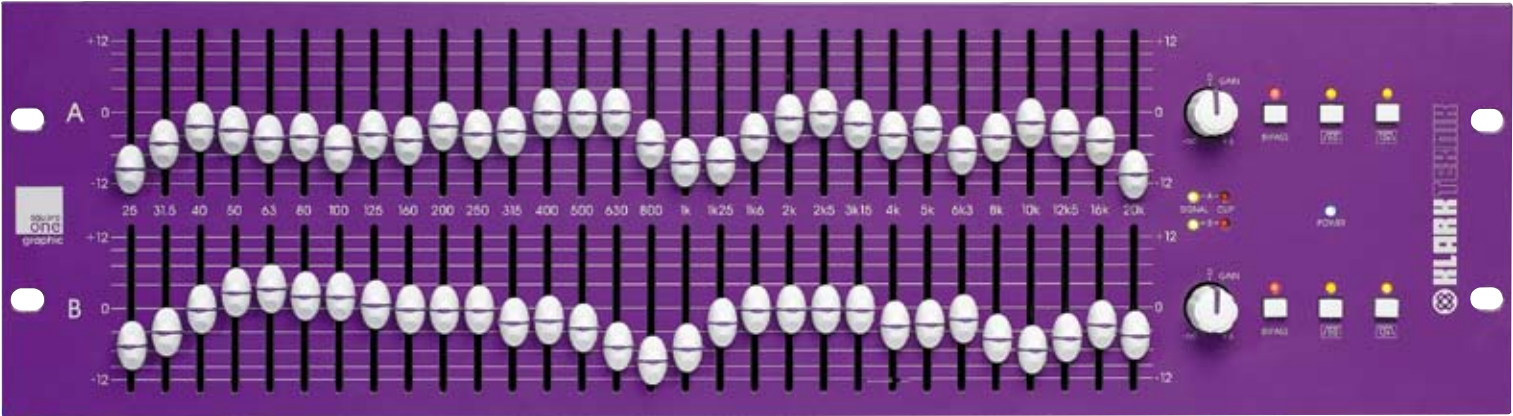
Low Pass Filters

The Square ONE Graphic's LPF is fixed at 12kHz. This is optimal for stage monitoring applications, both loudspeaker and IEM systems, and will increase available headroom as well as providing HF drivers with some thermal protection against ultrasonic frequencies.

When engaged simultaneously, the Square ONE Graphic's HPF and LPF give optimal control of the operating bandwidth of most foldback (floor wedge and IEM) transducer systems.

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graphic



Architects and Engineers Specification.

The Graphic Equaliser shall provide ± 12 dB of boost and cut at 30 1/3 octave ISO centre frequencies from 25Hz-20kHz.

A Power On Led shall be provided.

The Graphic Equaliser shall meet or exceed the following performance specifications:

Frequency Response

± 0.5 dB (20Hz-20kHz)

Distortion

(THD+N) <0.005% @1kHz, +4dBu

Dynamic Range

>112 dB (20Hz-20kHz unweighted)

The Graphic Equaliser shall allow have one fixed second-order high pass filter with an 80Hz corner frequency and one fixed second-order low pass filter per channel with a 12kHz corner frequency.

The Graphic Equaliser shall have an equalisation section by-pass and shall be fail-safe, that is the unit shall return automatically to the by-pass condition in the event of power supply interruption.

The Graphic Equaliser shall use centre-detented slide potentiometers arranged to give a graphical display of frequency plotted against level. The slide potentiometers shall have protective covers to inhibit the ingress of dirt and dust.

All audio connections shall be electronically balanced and use XLR and 1/4" TRS jack connectors.

The Graphic Equaliser shall be capable of operating from a 100-240V $\pm 10\%$ 50/60Hz a.c. power source.

The Graphic Equaliser shall be the Klark Teknik Square ONE Graphic, and no alternative specification option is available.

Technical Specification

Inputs

Type
Impedance (Ω)

Two

Electronically balanced (pin 2 hot)
20k

Outputs

Type
Minimum load impedance
Source impedance
Maximum level

Two

Electronically balanced (pin 2 hot)
600 Ω
<60 Ω
+22dBu into >2k Ω

Performance

Frequency response
EQ out
EQ in (flat)
Distortion (THD+N)
Noise Floor
Overload indicator
Gain

± 0.5 dBu
 ± 0.5 dBu
< 0.005% @ 1kHz, +4dBu
<-90dBu
+19dBu
- ∞ to +6dBu

Equalisation
Centre Frequencies

30 Bands
To BS EN ISO 266:1997
25Hz-20kHz, 1/3 octave

Tolerance
Maximum Boost/Cut
High Pass Filter Slope
Low Pass Filter Slope

$\pm 5\%$
 ± 12 dB
12dB/octave
12dB/octave

Terminations

Audio
Power

3-pin XLR and 1/4" TRS jack
3-pin IEC

Power Requirements

Voltage
Consumption

100V-240V a.c. $\pm 10\%$
<25W

Dimensions

Height
Width
Depth

133mm (5.25 inch) - 3U High
482mm (19 inch)
205mm (8 inch)

Weight

Nett
Shipping

4.4kg
5.4kg

square one splitter

The analogue audio splitter remains the most versatile and cost effective way of distributing audio signals to multiple locations, especially in a world where digital and analogue consoles are paired in Front of House and monitor configurations, and digital consoles employ different audio transport protocols.

The Square ONE Splitter provides a simple solution with a user-friendly, high-performance, Midas XL8 inspired pre-amp design, packaged in a 2U, eight channel format.

To increase versatility and provide additional value, a third set of transformer-isolated independent (fixed gain) outputs are provided plus the Square ONE Splitter's ability to function as a 1-16 media split.

Audio performance, as with all Klark Teknik's units, are of a superlative standard.

Features

Midas XL8 inspired mic preamps

Designed by the same team who created the world's best live sound consoles. A huge >140dB dynamic range and an extremely high CMRR accommodates input levels up to +22dBu.

9-position rotary gain switch per input

A simple 5dB resolution 'stepped' rotary control to provide gain adjustment for both main outputs from 0dB to +40dB to easily match any signal level (mic or line).

30Hz Hi-pass filter with switch and status LED per input

Eliminates unwanted subsonic information, increases headroom in the mixing console inputs, amplifiers and loudspeakers.

Inputs duplicated on front and rear panels

For convenient connection options, either internal to the patch rack, or directly into the front panel.

Transformer-isolated gain-independent outputs

Located on the front panel for easy connection of recording devices and outside broadcast facilities. Transformers provide superior galvanic isolation; fixed-gain status prevents unexpected changes in level during performances.

Front-panel and remote 48V switching with status LED per input

Phantom power activation can be switched remotely from the +48V supply on any mixing console connected to the electronically balanced outputs.

Solo buss with integral headphone amp and level control

Allows the mic amp performance and level to be monitored directly from the front panel. Also an invaluable aid when fault-finding in line systems.

1:16 media split function with front and rear panel status indication

Input 8 can be routed to ALL 16 rear-panel XLRs simultaneously via a single recessed switch on the rear panel. Ideal for press feeds and many other multiple-signal distribution applications

Separate ground lift switch with LED status indicators for each set of rear panel outputs

Eliminate hums, buzzes and other ground-related undesirable audio artefacts.

Individual 4-Segment LED output metering for each input

3 colours, easy-to-see instant status indication (-15, 0, +12, +21dBu)

Roadworthy (2U) all-steel chassis

Designed to withstand the rigours of the road.

Universal power supply

Auto voltage sensing, operates anywhere between 100-240V ($\pm 10\%$).



square one

splitter



Architects and Engineers Specification.

The Microphone Splitter shall provide eight (8) discrete audio channels in a standard 2U 19” rack mount chassis.

Each channel shall have a variable-gain microphone preamplifier feeding two electronically balanced outputs (identified as A and B, located on the rear panel). Additionally each channel shall have a parallel signal path with a fixed gain (-6dB) driver feeding a transformer isolated output (identified as C, located on the front panel). The variable-gain microphone preamplifier on each channel shall provide a stepped rotary gain control with gain increments of 5dB from 0dB (unity) to +40dB. The variable-gain signal path shall also include a 30Hz high-pass filter, enabled by a switch on the front panel. This switch shall have an associated LED on the front panel to indicate when the filter is active.

The output of the variable-gain microphone preamplifier shall feed a four (4) segment LED bargraph, with indication for -15dBu, 0dBu, +12dBu and +21dBu.

Each channel input shall have a front-panel switch for +48V phantom power, and additionally shall be able to detect the presence of phantom power on its electronic outputs, and automatically enable the phantom power supply to the input on a logical-OR basis with the front panel switch. The front panel phantom power switch shall have an associated LED which indicates that phantom power is enabled on that channel's input, either by the switch being enabled, the presence of phantom power being detected on its electronic outputs, or both.

Each channel shall have a solo enable switch to route the output of the variable-gain microphone preamplifier to a solo bus which feeds a headphone amplifier. The solo enable switch shall have an associated LED to indicate when the channel is being routed to the solo bus. The headphone amplifier shall have a headphone jack socket for the headphones and a rotary level control for the headphones output.

The Microphone Splitter shall incorporate a Media Split function, providing a switchable function that routes the output from the Channel 8 variable-gain amplifier to all 16 electronically-balanced outputs,

disconnecting the respective signal paths from the variable-gain amplifiers of Channels 1 to 7 inclusive.

Each set of eight electronically-balanced outputs (A and B) on the rear panel shall have an associated ground lift switch.

Each Microphone Splitter shall meet or exceed the following performance specifications:

Frequency Response
± 0.5dB (20Hz to 20kHz)

Distortion (THD+N)
< 0.02% @ 1kHz, 0dBu at unity gain

Dynamic Range
Electronically balanced outputs: > 122dB (22Hz to 22kHz unweighted)
Transformer balanced outputs: > 140dB (22Hz to 22kHz unweighted)

The audio connections for each of the eight (8) audio channels shall be via 3-pin XLR style connectors:-

Inputs: two parallel-connected female XLR connectors (one on the front panel and the other on the rear panel).

Electronic Outputs: two male XLR connectors on the rear panel.

Transformer Outputs: one male XLR connector on the front panel for each output.

The unit shall be capable of operating from a 100 to 240V ±10%, 50 to 60Hz AC power source. The unit shall have the option of dual redundant power supplies.

The Microphone Splitter shall be the Klark Teknik Square ONE Splitter and no alternative option is available.

¹ Measurement conditions: unit powered, all filters bypassed, unity gain and output terminated with 20kΩ balanced loads.

² Measurement conditions: unit powered, both inputs terminated with 150Ω, all filters bypassed, unity gain set to 0dB and outputs terminated with 20kΩ balanced loads.

³ Measurement conditions: unit powered, all inputs terminated with 150Ω, all filters bypassed, outputs terminated with 20kΩ balanced loads.

Technical Specification

Inputs Type	8 (mic/line) Analogue, electronically balanced, female XLRs (Pin 2 hot)
Maximum input level	+22dBu
Input impedance	5kΩ
Common mode rejection ratio (CMRR)	-80dB at 1kHz (typical), unity gain (0dB) -100dB at 1kHz (typical), maximum gain (+40dB)
Outputs Type	16 (rear panel) Analogue, electronically balanced, male XLRs (Pin 2 hot)
Operating level	0dB
Maximum level	+22dBu
Output impedance	<50Ω
Signal drive capacity	<600Ω
Outputs Type	8 (front panel) Analogue, transformer isolated balanced, male XLRs (Pin 2 hot)
Operating level	-6dB
Maximum level	+22dBu
Output impedance	<75Ω
Signal drive capacity	<600Ω
Headphone output Type	1 Analogue, TRS jack socket
Rating	750mW (nominal 50Ω load)
Terminations Audio Front panel connectors	Channel input: eight x AA series female XLRs (labelled "IN 1" to "IN 8") Isolated output C: eight x AA series male XLRs (labelled "TX OUT 1" to "TX OUT 8") Headphone output: one 1/4" TRS balanced jack socket
Rear panel connectors	Channel input: eight x AA series female XLRs (labelled "IN 1" to "IN 8") Electronic output A: eight x AA series male XLRs (labelled "OUT A") Electronic output B: eight x AA series male XLRs (labelled "OUT B") 3-pin IEC
Power	
Performance Frequency response ¹ Distortion Dynamic range ²	±0.5dB (input to output), 20Hz to 20kHz <0.02% @ 1kHz, 0dBu at unity gain Electronically balanced outputs: >122dB* Transformer isolated outputs: >140dB* Unity gain <-100dBu* Mic EIN @ +40dB gain <-128dBu*
Noise floor ³	
High pass filter Filter frequency Filter slope	-3dB @ 30Hz 12dB per octave
Power Requirements Voltage Frequency Consumption	100VAC to 240VAC ±10% 50Hz to 60Hz <35W
Dimensions Height Width Depth	88 mm (3.5"), 2U high 482 mm (19") 200 mm (7 7/8")
Weight Net Shipping	4.5 kg 5.7 kg



KLARKTEKNIK
SIGNAL PROCESSING BY DEFINITION

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