

# Klark Teknik Pocket Guide

Innovation. Design. Performance.



# Introduction

## a brief history of Klark Teknik



In 1974, brothers Phil and Terry Clarke founded Klark Teknik Research Ltd. In the years immediately following, their pioneering approach to design and development allowed them to introduce some truly groundbreaking designs. The world's first digital delay and digital reverb units emanated from their laboratory, and their descendants remain in common usage all over the world to this day.

However it was their concepts for equalisation devices that really changed the world of professional audio resulting in the uniquely capable DN370 and the world famous DN360.

Today Klark Teknik continues to bring innovation in design, engineering and sonic quality in both the analogue and digital realm of signal processing. Uniquely in its field, Klark Teknik also provides the customer with an opportunity to invest in leading-edge equipment with an extraordinary working lifespan and unrivalled retained value.

Klark Teknik products are represented by an international network of appointed distributors, all of whom are authorised to sell and provide technical support for our products. Full contact details for all our distributors are available from the website at [www.klarktechnik.com](http://www.klarktechnik.com), however please contact the factory direct for information if necessary.

Due to company policy of continual improvement we reserve the right to change the specifications of Klark Teknik product without prior notice.

## Helix System overview



The Klark Teknik name is globally synonymous with professional EQ products, following the success of products like DN27, DN360, DN410, DN4000 and DN3600. Now we have brought all this experience together to produce the next generation of equalisation – the multi award winning Helix system.

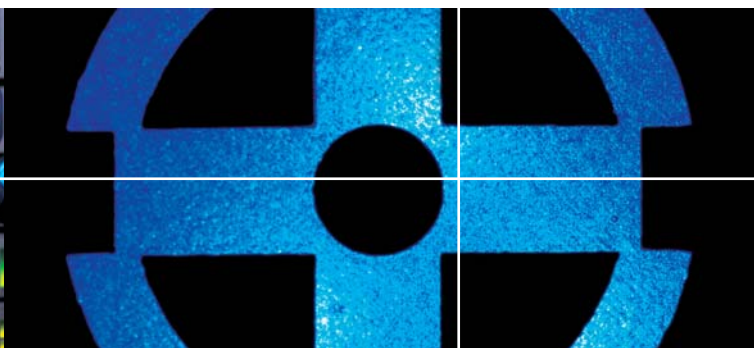
The Helix system comprises two units, the DN9340 master unit and the DN9344 slave. The DN9340 Helix Master unit is a two-rackspace, dual channel device fitted with a simple and intuitive user interface whilst the DN9344 Helix Slave is a single rackspace unit that effectively contains two DN9340s in one chassis, thus providing four channels.

Helix provides a sophisticated but intuitive audio equalisation system in a very compact package. Its unique selection of functions allows EQ to be applied with total precision, using the types and combinations of filters that deal most effectively with a given situation. Like all Klark Teknik DSP devices, Helix is equipped with more than enough computing power to allow all functions to be fully operative at all times.

The principal operational advantage of Helix is that it offers all the functionality of several standalone devices in one package, thus saving massively on both cost and rackspace. For instance, enough EQ for a 24-way monitor mix plus two sidefills will fit into just EIGHT rackspaces (six DN9344 slaves and one DN9340 Master), at almost exactly the same cost as the same number of channels of top-class analogue graphic EQ.

The Helix system also includes full remote control for all functions of both units via an Add In to the Midas and Klark Teknik ELGAR PC software shell available free from [www.klarkteknik.com](http://www.klarkteknik.com).

## T-DEQ dynamic EQ



For everyone who has ever used frequency-conscious compression, T-DEQ is the control tool you've always dreamed of.

T-DEQ allows the relative level of a frequency (or range of frequencies) to be programmed to maintain a constant offset above or below a programmable threshold. Essentially you are saying to the Helix 'I want frequency 'A' to be at level 'B' when the overall level through the unit is 'C'.

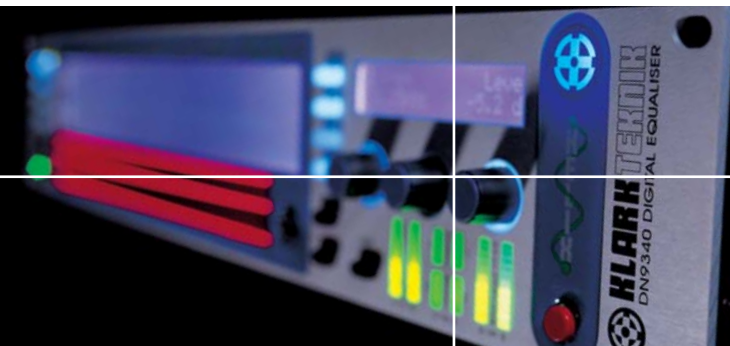
The applications for this unique function are limited only by your imagination, but here are some examples:

- Controlling resonant room frequencies
- Horn equalisation
- Frequency-specific limiting for speaker protection
- Limiting a specific source by using on a channel insert
- Enhancing a specific source by using on a channel insert
- Overall system limiting where maximum SPLs are enforced
- Feedback control in monitors with greatly improved intelligibility

The system-limiting abilities are of particular interest to installers where a Helix can be programmed and then secured by a password, thus satisfying even the most draconian noise level limits. The real beauty of it is that it is completely transparent in operation, with zero audible artefacts, unlike the compression-based function in any other unit. Once you've used it you'll never want to use anything else.

## DN9340 Helix

digital equaliser



The DN9340 is a 2RU, dual channel device that condenses all commonly-used EQ functions into one unit, and adds a couple of new ones that are unique to Klark Teknik.

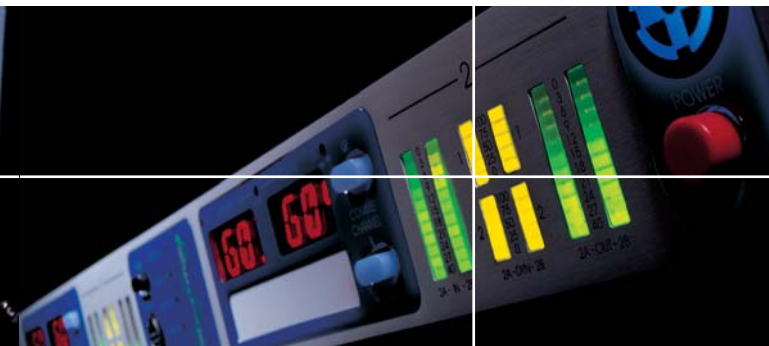
In one device, you now have access to: a dual 31-band multi-mode graphic equaliser: a dual 12-band parametric equaliser: four configurable filters per channel: up to 1s of delay per channel: and two 'T-DEQ' filters, which simply redefine realtime dynamic control, which is explained later on. Like all DSP devices from KT, there is more than enough processing power to allow all functions to be active all the time, so you'll never have to choose a less than ideal solution.

Full time metering is provided for inputs, outputs and T-DEQ functions, and overall the control surface is simple and intuitive to use. Below the main display is a dual touch strip, which allows one-step access to various functions, obviating the need to use separate rotary encoders. Helix will also link to DN6000 to provide auto-EQ functions if required, and there is a special bonus for owners of Midas Heritage, Legend and Siena series consoles too: by using one simple connection, Helix will provide 'auto-solo' functions via the unique Solo Tracking System (STS). (Described in depth later).



## DN9344 Helix

digital slave equaliser



At Klark Teknik we always try to add value to our units, and provide the greatest functionality we can, hence the DN9344 Slave unit. This device manages to cram no less than FOUR channels of Helix configurable EQ into just ONE RACKSPACE – that is four completely independent channels of every kind of EQ you'll ever need, in one 19" space!

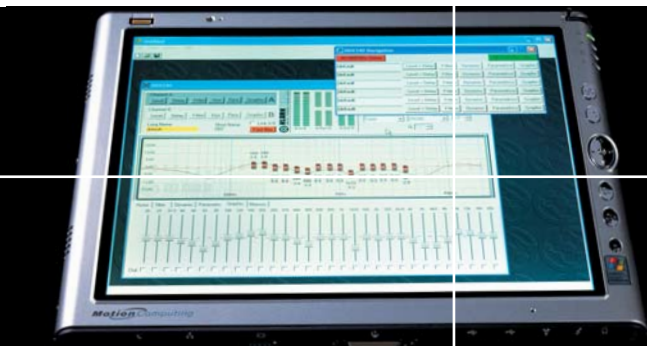
Now think about the expansion possibilities: six Slaves and one Master unit would take up just eight rackspaces yet offer twenty-six channels of totally configurable EQ. That could be a complete Midas Heritage 3000 24- way monitor setup plus two channels for sidefill, all of which can be automatically solo'd from the console via STS! The DN9344 Slave really is four complete Helix channels, you don't lose any functionality at all, and like the Master unit, there is more than enough processing power on board to run every function flat out all the time if that's what you need.

The front panel metering is exactly the same as the Master, plus controls to set comms channels and a 'ME' LED which shows at a glance which channel is currently being adjusted. For fixed install purposes there is provision on the rear panel to allow selection of up to eight programs from an external contact closure, and we've even built in physical scribble strips on the front so you can annotate the channels as necessary for a given application.



## Helix Remote Control

an ELGAR add-in



To increase the functionality and control flexibility of the award-winning Helix digital EQ system comes the latest Add In for the Midas and Klark Teknik ELGAR control shell – the DN9340 / DN9344 PC remote control software.

This allows remote PC access to all the functions of Helix, including overall system store and recall. An extremely intuitive Graphical User Interface (GUI) allows simple navigation between function pages, the overall number of which has been kept to a minimum. The system is designed to work with all PCs including the latest handheld PC tablets for ease of wireless connection and portability. Real-time indication of unit online / offline status is visible on all pages and the individual function pages have familiar and easy to use controls whether using a mouse, keypad or stylus.

The make or break of this type of system is always navigation, and this is one of the Helix RCS's real strengths, using our proprietary 'FastNav' page. This is a control panel that is always active, and shows every function of every channel. Thus it is possible to move between, for instance, the graphic EQ for channel 10 and the T-DEQ controls for channel 37 with a single click. Available now as a free download from [www.klarktechnik.com](http://www.klarktechnik.com).

## STS

Solo Tracking System



Helix offers the ability to link to all Midas consoles in the Heritage, Legend and Siena range via the Solo Tracking System. This means that when you press any solo key on the console, the EQ for that input or output is instantly shown on the Helix master unit or wireless PC tablet ready for immediate control. Once displayed on your chosen user interface you naturally have complete access to all the Helix functions allocated to that input or output.

A RS-232 connection is supplied on the rear panel of Helix for this purpose, and up to 64 channels of Helix can be interconnected using standard microphone cables.





## DN9848

system controller

## DN9848

applications



The objective of DN9848 is to bring total system control within the scope of a single rackspace unit.

Featuring four inputs and eight outputs, all on standard XLR connectors, the unit is configurable to any application as the routing is completely flexible.

From 4-way stereo FOH to quad bi-amp monitors and anything in between, DN9848 allows the creation and storage of enough different system configurations to satisfy even the most demanding user. Front panel control is very simple and intuitive, and full PC remote control and programming access is available via free proprietary software.

In common with all Klark Teknik DSP-driven devices, we provide enough processing power to make all the facilities available all the time, so you'll never run out of power or programming options. And look at how much control you have: 96 parametric EQ filters, 12 delay lines, 16 all-pass filters, 12 full-function compressors and 8 look-ahead limiters, plus all standard crossover filters in up to 48dB / octave slopes.

Best of all, because we pour every drop of our experience into every single product we make, the audio result is among the very best you'll find anywhere.

Since its introduction DN9848 has attained an enviable reputation for reliability, simplicity of operation and, above all, superlative audio performance. Its original concept was as a sophisticated DSP-based crossover, but the 4x8 format and its totally configurable routing means it has found a number of less obvious applications:

**Bi-amp monitors:** four bi-amped mixes from a single rackspace device means compact and easily configurable amp racks. Password-protection at several levels and genuine no-overshoot limiters means dry-hire with absolute confidence (and great-sounding, feedback-free monitors).

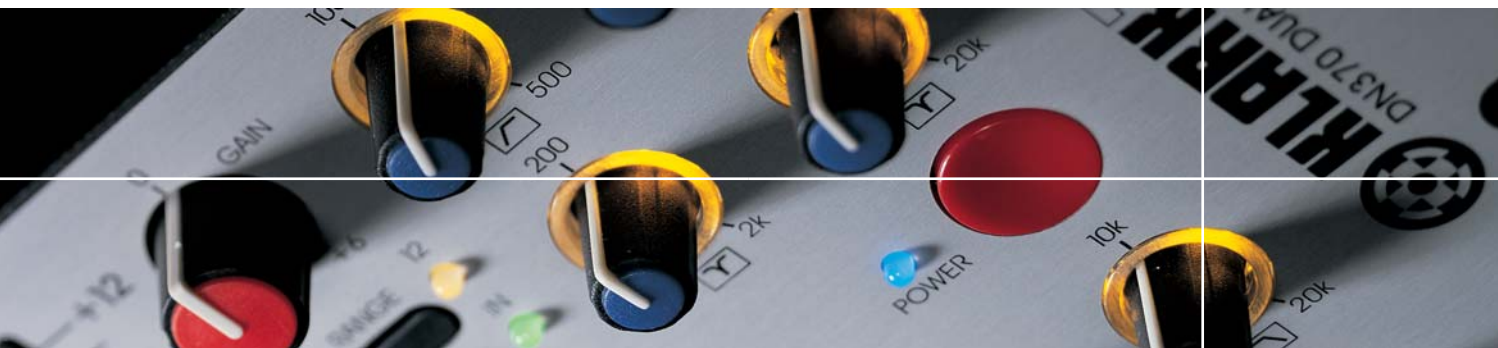
**Powered speaker systems:** The concept of loudspeakers with onboard DSP processing and amplifiers offers many advantages. There are however numerous occasions when further control is needed – 'beam steering' low-frequency arrays through the use of zoned delays for example, or providing individual EQ for sets of speakers throughout a line-array hang.

**Zone control:** the ability to EQ and delay 'zones' of loudspeakers from a central point is vital in applications such as conference, theatre and cinema. The format and processing power of DN9848 lends itself particularly well to this application.



## DN370

### graphic equaliser



The all-new Klark Teknik DN370 is the latest evolutionary step in a process of design refinement that goes back over 30 years. With DN370 we've started from the ground up and produced a unit that is totally without compromise, and one that we believe is the finest professional graphic equaliser in the world today. It also perfectly complements the existing Klark Teknik range of equalisers, both analogue and digital.

Our aim is simply to provide discerning professional users with the best possible solutions for system control. Our market research shows that the graphic equaliser is still the most commonly-used EQ device in fixed and mobile live sound applications, as well as many installations, mainly because the physical user interface provides instant access and controllability in even the most demanding environments. To this end we have completely re-evaluated the role of the graphic EQ, focusing exclusively on providing a new feature set that better reflects the needs of modern users.

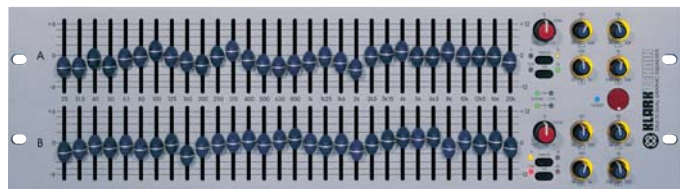
## DN370

### notch filters

The dual sweepable notch filters on DN370 offer a whole new level of control of problem frequencies, previously unavailable on analogue graphic EQs. They can be used to eliminate a common problem with graphic equalisers – the control of frequencies that lie between the ISO standard frequency centres. For example, to cut 900 Hz, a single notch filter can be used to produce a steep notch in the frequency response without affecting adjacent frequencies. In contrast, on a graphic equaliser without notch filters, the only solution available is to cut both the 800 Hz and 1 kHz faders, and very often, a broad range of other frequencies will also be affected, particularly when a Symmetrical-Q equaliser with a wide response is used.

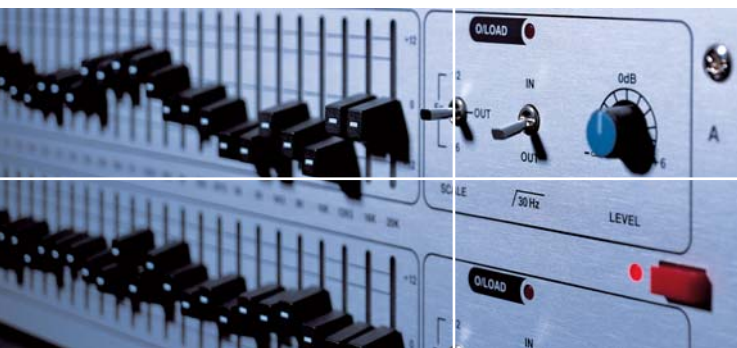
The ability to overlap the notch filters, both with each other and with the graphic EQ bands, allows very deep notches to be created. When two notch filters are overlapped with an EQ band, nearly 45 dB of attenuation is possible.

Using the notch filters in combination with the high- and low-pass filters allows a very usable EQ response for monitor wedges to be created during set-up. The HPF and LPF filters can be used to attenuate the amount of out-of-band energy that can limit the intelligibility of the wedges, and the notch filters can be used to eliminate particularly hot frequencies, leaving the graphic EQ section to be left flat for use by the monitor engineer during showtime.



## DN360

graphic equaliser

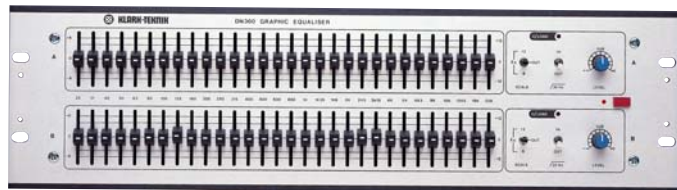


Very occasionally, a design is so correct from the very start that it needs little or no development over many years.

The Klark Teknik DN360 has been in continuous production for twenty years with only one minor design revision, and is still the most popular analogue graphic equaliser on the planet.

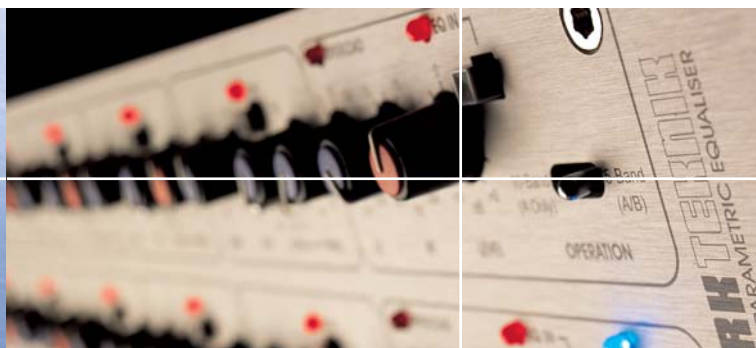
With over 30,000 units shipped worldwide to date, DN360 has achieved ubiquity in pro-audio circles. So why is it so enduringly popular? Like all KT units it is well designed and engineered to very high standards so will handle continuous road use with only minimal service. They are also very consistent, so engineers using units sourced locally all over the world will get the same response every time.

But perhaps most important of all is the way they sound – it's notoriously difficult to describe sound, but talk to anyone that prefers DN360s to any other graphic and they will use words like 'musical' 'smooth' 'responsive' and 'great sounding'. Primarily this is because we use proportional-Q filtering, where the 'Q' value of the frequency increases as the cut or boost increases. This provides a flowing response at low cut / boost values, but also accurate frequency control at higher values.



## DN410

dual parametric equaliser



Analogue EQ has always been the cornerstone of the Klark Teknik range, and the DN410 is widely regarded as among the very best analogue parametric equalisers money can buy.

Built to the usual uncompromising Klark Teknik standards, the DN410 is a dual channel, two rackspace device. It features five filters per channel, and unlike many apparently similar units, all bands are fully configurable between 20Hz and 20kHz.

Each filter offers cut and boost of  $-25\text{dB}$  and  $+15\text{dB}$  respectively, with available bandwidth settings of  $1/12\text{th}$  to 2 octaves. Further, the DN410 may be configured (via a front panel switch) to be a single channel of ten filters if required.

It is fitted with high and low pass filters for each channel, and signal relays which ensure that audio signal reaches the outputs even in the event of power loss.

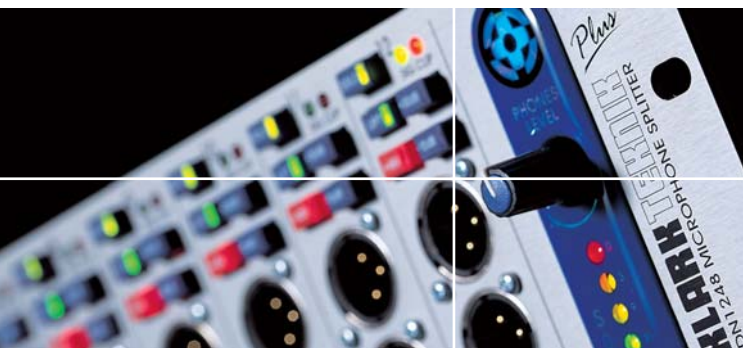
All filters are individually switched in and out of circuit, plus an overall channel bypass switch is fitted.

DN410s are found in many applications, but most commonly in theatre or AV situations where omnidirectional lavalier or lectern microphones are used.





## DN1248 *Plus* mic splitter



Even in this digital age, we've kept sight of the numerous applications where analogue devices provide the best solution.

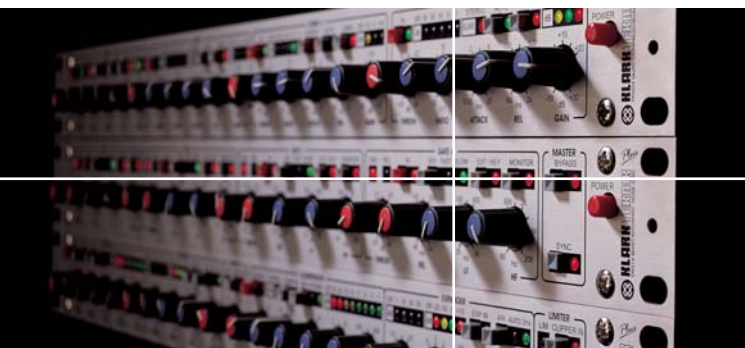
One such application is providing multiple feeds from a single source, hence the introduction of the DN1248 Plus Active Signal Splitter.

Housed in a roadworthy 3RU chassis with internal power supply, a single DN1248 Plus provides twelve input channels, each feeding four outputs, two of which are electronically balanced and two of which are transformer isolated. All the inputs and output one are also duplicated on the rear of the unit, so the patching options are extremely flexible. The microphone preamplifier is a Midas Heritage series circuitry, specially adapted to the task and providing all the great sound and headroom for which Midas preamps are world famous.

Several factory options are available for DN1248 Plus: the 'DP' option, which provides (at very low cost) a second, linked internal PSU to provide auto-backup in the case of PSU failure. The 'AT' option provides transformer balancing for all 48 outputs, and the 'FM' variant combines both 'DP' and 'AT' advantages. Plus, the whole unit is designed so that a customer can easily retrofit the multipin connector and input / output configuration of their choice, including a pin-out diagram printed on the underside of the top cover.



## DN500 *Plus* series dynamic processors



The revised DN500 Plus series utilises a new 'THAT's' chip which features lower distortion, improved dynamic range and faster slew rate. We've updated the cosmetics too, bringing them into the new KT 'family look'.

The DN500 Plus is our dual compressor / limiter / expander which is characterised by its extremely quiet operation, typically >2dB quieter than any comparable product. This alone has made it a broadcast-industry standard for many years. The two channels are linkable for true stereo operation, and both the compressor and expander sections are fitted with their own sidechain inputs.

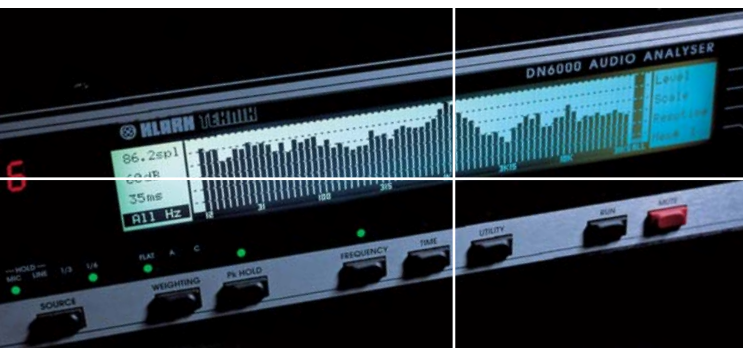
The DN504 Plus Quad Compressor has enjoyed hugely increased popularity in recent years, due to the ever expanding use of in-ear monitor systems. This is because the unit can be configured into two stereo pairs, has all the superlative audio performance of the DN500 Plus, and fits two sets of stereo compression into just one rack space. This configuration also makes it extremely cost effective.

DN514 Plus has become one of the industry standard multi-gate devices for both recording and live applications. Providing the same superb audio performance as its other 500 Plus-series, DN514 Plus packs four channels of frequency conscious gating into just 1RU. This provides a significant operational advantage, being able to tailor the operation of each gate to a specific frequency range.



## DN6000

### audio analyser



The DN6000 Real Time Analyser (conforming to the Type 1 requirements of IEC804: 1985 – Standard Specification for Integrating / Averaging sound level meters), offers time and frequency analysis facilities to rival units costing many times more.

Supplied with a 6051 microphone (to which each unit is individually calibrated), DN6000 operates in many modes. Real time frequency analysis, with peak hold and A / C weighting is available in 1/3 and 1/6 octave resolutions, along with real time frequency specific SPL reading via a moveable cursor.

The microphone input can be trimmed externally to suit other microphones, and the unit's dual line inputs can provide stereo or mono in-line monitoring.

The user can conduct timed analyses of between 25ms and 180 hours, then apply RT60, LeQ, LeQ and delay time measurements to them. 66 non-volatile user memories are provided, and it is possible to compare a stored analysis with the current reading.

DN6000 features an onboard print driver which allows the user to print directly to a compatible printer. It is also fitted with a serial port for connection to a PC so that any print function can be displayed on a computer screen and then printed from there if required.



## DN1414

### DI module



A good DI (direct-injection) device is essential in almost any system. Given that its primary function is to replace a microphone, the audio performance is critical. They also need to be extremely rugged, and also capable of providing flexible operation. The Klark Teknik DN1414 DI module both meets these criteria, and more.

The DN1414 multiple DI module packs no less than 14 discrete DI boxes into a single 3RU package. 10 channels are configured as individual channels and the two remaining channels are arranged in pairs, featuring simple jack in / XLR out connection for use as single DI units or as stereo pairs.

Customers can specify a factory-fitted dual power supply option if required, and the unit is also fitted as standard with a multipin retrofit kit. This allows a user to fit the multipin connector of their choice to a blank panel on the rear and then hard wire the outputs direct to it.

All this makes the DN1414 a very flexible device which suits a number of applications in live production, in the studio and in broadcast.



## DN100

Active DI



Direct-injection boxes are, in many ways, the unsung heroes of audio. Their correct use promotes purer audio connections, truer interpretations of the real sound of the source signal, and reduces the risk of feedback in live situations.

The Klark Teknik DN100 Direct Injection Box is the natural successor to the long-established LBB100. A ground-up redesign provides an extended dynamic range, lower noise floor and all the world-class audio performance you'd expect from Klark Teknik. DN100 is also designed to handle the rigours of life on the road: a thick aluminium shell protects the electronics, and this in turn is protected by a tough silicone rubber casing, which is replaceable and available as a spare part.

We've also fitted a Kensington security slot in one of the end panels to allow the unit to be made secure using a Kensington MicroSaver security cable.

Attention to detail – it's what makes a good unit into a great one.



## Software

ELGAR Software Shell



ELGAR is a software shell for a PC that allows Midas and Klark Teknik product control software, called add-ins, to operate.

ELGAR allows data from individual units, for example a number of Helix units and a Midas Heritage 1000, via the relevant add-in to be stored within one show file on your PC. You can therefore have your entire show with you on your laptop, allowing you to fine tune settings in your hotel room and then just upload it later at the venue. ELGAR will also ensure that the correct add-in will only communicate with the correct piece of hardware – in other words it will make certain that the Helix remote control add-in will only talk to the Helix unit and not the Heritage 1000.

## Accessories

### and factory options



#### Security Covers:

For installation purposes, applicable KT units can be supplied with either smoked perspex or brushed aluminium security covers of the appropriate size.

#### Balancing Transformers:

Some KT units can be supplied with input and/or output balancing transformers if required. Klark Teknik distributors can advise availability for all models.

#### Wireless Peripherals Kit (WPK-1):

This is a wireless ready package for Helix system allowing all the functions of the Helix system to be controlled from a wireless tablet or laptop PC. This kit will also allow the Helix to be integrated into a local area network (LAN).



**KLARK TEKNIK**  
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