



THE SOLUTION-D FAMILY

*True* Diamonds





NEUMANN.BERLIN

▶▶ THE MICROPHONE COMPANY



## A Microphone Technology Milestone

Neumann has repeatedly set new standards in the field of analog microphone technology. The first condenser microphone, switchable directional characteristics, the first stereo microphone and 48 V phantom power were all developed by Neumann, introducing new dimensions to the field of microphone and recording technology.

With the digital Solution-D microphone system, Neumann has now succeeded in bringing the dynamic range and signal fidelity of the best analog studio microphones into the digital realm. This means that, for the first time, the whole audio production signal chain is entirely digital.

Optimized A/D conversion, especially developed synchronization technology and the capability of controlling standard microphone parameters and various integrated signal processing functions remotely ensure that Solution-D meets the most demanding professional audio production requirements. The basic technological principle is to permit recording with no “bottlenecks” associated with loss of signal quality.

The comprehensive features provided by Solution-D make it possible to achieve excellent quality with small digital productions – with only a single microphone and a recording device.

The Solution-D digital microphone system is comprised of the following components: A digital microphone (e.g. the D-01 large-diaphragm microphone or a KM D small-diaphragm microphone), the DMI-2 digital microphone interface and the RCS remote control software, which operates and remotely controls the microphone. A PC or Mac can serve as the control computer, which of course can simultaneously be used to operate the actual recording system, for instance.

The signal and data transmission of the microphone conform to the new AES 42 standard. The introduction of this standard governing the transmission of output signals, the supply of power and the remote control of microphones with digital outputs provided the necessary preconditions for the development of digital microphone technology. Neumann made a decisive contribution to the drafting of the AES 42 standard.

Instead of being used with the DMI-2, the KM D small-diaphragm microphones can alternatively be connected to the AES/EBU or S/PDIF interface of a recording system by means of a Connection Ki. However, if a Connection Kit is used, it is not possible to control the microphone functions remotely. Thus a control computer is not required. In this case, if it is necessary to synchronize several microphones, a sample rate converter must be used.

A Battery Pack is available as an option for use with the Connection Kit, thus permitting the small-diaphragm microphones to be used with portable recording equipment.

All of the possible Solution-D system configurations are illustrated on the following pages.

The Starter Set, comprised of a KM 184 D and a Connection Kit, provides an economically attractive entry into the world of digital microphones. If the user later wishes to take advantage of additional switchable parameters and remotely con-



TRUE NEUMANN SOUND:

The legendary Neumann sound in the digital realm. Pure Neumann capsule sound.

## The System

### Description

trolled functions, the system can be expanded at any time by acquiring a separate DMI-2.

Any audio engineer who is familiar with digital technology can begin production with Solution-D immediately, without extensive training. The additional features provided by digital microphones open up new possibilities for production.

### Remote control of standard microphone parameters

With the DMI-2 digital microphone interface, familiar microphone settings such as the directional characteristic, pre-attenuation and low-cut filter can be controlled remotely. Changing the settings of microphone parameters is greatly simplified, which facilitates rapid testing of different settings so as to optimize the sound quality. It is no longer necessary to make handwritten records of all of the settings.

### Integrated digital audio signal processing

An A/D converter developed by Neumann, especially optimized for the capsule signal conditions, receives the output signal directly from the microphone capsule. Level matching required for subsequent devices is performed digitally, in the microphone itself. Analog components such as preamplifiers and A/D converters are thus no longer required, resulting in significant cost savings.

The immediate conversion of the analog signal results in a significant improvement in the dynamic range. This is perceptible throughout the entire signal chain, making level adjustments less critical.

Mixing console functions such as mute and phase reverse, which affect the microphone signal, are likewise integrated into the microphone. For the D-01, even commands such as "On Air" (red light) are executed by means of remotely controlled microphone LEDs. A particularly significant feature is the transient limiter function. For the first time, this function can be applied at the most effective point, at the signal source, in order to reduce harmful transients. In the case of analog microphones, in the subsequent signal path a great deal of headroom must be provided for such signals, which are very short but which have a large amplitude.

### Data transmitted by the microphone

Information transmitted by the microphone includes the name of the manufacturer, the model, the serial number, the software version installed in the microphone, and a list of remotely controlled functions supported by the microphone. Sta-

tus indicators such as certain warning functions and operating readiness are also transmitted.

During production, the audio engineer can continuously monitor the status of the microphones, since all the important parameters, including signal levels, are displayed on the screen. In addition, a text input field is provided, allowing a channel name to be assigned, e.g. indicating the sound source. All of the microphone settings can be stored in configuration files and retrieved as required.

### Why digital signal processing?

The digitization of audio data began many years ago, at the end of the signal processing chain, with the development of the first digital recording equipment. Almost all audio signal processing components are now available in digital form.

It is well-known that digital signals provide the necessary preconditions for mathematically precise calculations and processing, permitting signals to be modified, copied, transmitted and stored as desired, with no loss of quality.

In contrast, analog signal processing is characterized by limited precision, error accumulation, a lack of redundant signal information, and the use of error correction procedures. Each analog signal processing step is thus associated with a degradation of signal quality.

This results in a gradual decrease in the dynamic range, due to the introduction of noise voltages and nonlinear distortion.

In addition, digital processing permits the performance of functions that are difficult or impossible to execute via analog signal processing. This applies particularly to functions that are based on intermediate data storage.

### A/D conversion

Despite continuing improvements, integrated circuits available on the market still constitute a limiting factor in the conversion of audio data from analog to digital form.

For instance, the best delta-sigma A/D converters currently available as integrated circuits provide a dynamic range of 115 dB to 120 dB (A-weighted), for a theoretical word length of 24 bits.

This can be compared with the dynamic range of up to 130 dB exhibited by a high-quality analog condenser microphone. In order to prevent the addition of noise to the signal, a significantly improved A/D converter is therefore required. The conversion process must simultaneously be optimized for the signal levels and source impedance found in the microphone.



#### TRUE TO THE ORIGINAL:

The satisfaction of recording the uncolored original, with no "bottlenecks" between the capsule and the recording system.



#### TRUE CONVERSION:

The guarantee of having one of the best A/D converters available.



When A/D conversion is carried out in a mixing console or other equipment, as a rule, loss of signal quality is to be expected, since the conversion occurs after level matching has already been performed. As a result, the dynamic range is affected by headroom considerations and by the characteristics of the microphone preamplifier and the A/D converter.

The development goal was thus to effect high-quality digitization of the capsule signal directly in the microphone, so as to permit level matching and other processing steps to be performed digitally. This is the only way of preserving the signal quality that is generated by the microphone.

## Synchronization

The AES 42 standard describes two modes of synchronizing the microphone with the receiver (e.g. a mixing console or DMI-2 digital microphone interface):

**Mode 1:** The microphone operates asynchronously, using the sampling rate of its internal quartz oscillator. In this case, a sample rate converter is required at the receiver. However, this mode of operation should be used only if mode 2 synchronization is not possible, since conventional sample rate converters will impair the signal quality, for instance in terms of dynamic range and latency time.

**Mode 2:** The microphone is synchronized with a master word clock, which can be either an external word clock or the internal word clock of the DMI-2. In this case, a frequency/phase comparison of the microphone signal with the master word clock is carried out in the AES 42 receiver (DMI-2). A control signal is then generated that is transmitted via the remote control data stream to the microphone, where it controls the frequency of the internal quartz oscillator.

Via the BNC output of the DMI-2, the internal word clock generator can be used to synchronize additional DMI-2s and subsequent processing equipment, such as a mixing console.

## The D-01 digital microphone

At first glance, the D-01 microphone appears similar to an analog microphone. However, in the microphone, an A/D converter developed by Neumann which is especially optimized for capsule signal conditions receives the output signal directly from the capsule. The signal is immediately converted into a digital signal, generating an internal 28-bit signal with a dynamic range of more than 130 dB (A-weighted, including capsule characteristics).

The digital signal is then processed directly in the microphone. This means that parameters such as the directional characteristic, pre-attenuation, low-cut filter, gain and various switching functions can be set digitally and controlled remotely. External components such as analog preamplifiers and A/D converters are thus no longer required.

For the purpose of clear identification, information concerning the name of the manufacturer, model, serial number and installed software version is transmitted by the microphone to the connected receiver.

The microphone is equipped with a 3-pin XLR connector for transmission of a bi-directional signal conforming to the AES 42 standard. This signal includes the balanced digital microphone output signal, the phantom power supply, and a remote control data stream that also contains a signal for synchronizing the microphone with a master clock.

The D-01 is available with a classic nickel finish. All standard sampling frequencies are supported, from 44.1 kHz to 96 kHz.

## KM D digital miniature microphones

The KM D microphones are the digital counterparts of the well-known successful miniature microphones of the 180 series. The KM 184 in particular is regarded as a standard-setting analog miniature condenser microphone, and is one of the most popular of all Neumann microphones.

Six different capsule characteristics are being offered initially. The modular construction of the new microphones permits the KM D output stage to be combined with the various passive microphone capsules.

In the microphone, the Neumann A/D converter which has been extensively proven in the D-01 receives the output signal directly from the capsule. With a dynamic range exceeding that of the capsule, the converter permits optimal utilization of the capsule qualities. This ensures that the capsule signal is made available to the recording system without any coloration, with a hitherto unknown transparency.

If required, the DSP functions integrated into the microphone can be configured and controlled remotely via the DMI-2 digital microphone interface and the RCS remote control software. These functions include gain setting, a compressor/limiter with an additional de-esser function, and a peak limiter. The digital concept proves particularly beneficial here. The peak limiter, which receives the output signal almost directly from the capsule, acts as an automatic "safety valve", permitting



### TRUE HANDLING SAFETY:

Anti-clipping processing ensures handling safety, and reduces stress.

## The System

### Description

safe exploitation of the entire available dynamic range even in stressful recording situations.

For the purpose of clear identification, information concerning the name of the manufacturer, model, serial number and installed software version is transmitted by the microphones to the connected receiver.

The microphones are equipped with a 3-pin XLR connector for transmission of a bi-directional signal conforming to the AES 42 standard. This signal includes the balanced digital microphone output signal, the phantom power supply, and a remote control data stream that also contains a signal for synchronizing the microphone with a master clock.

Two versions of the digital miniature microphones are available: Classic nickel, and black Nextel finish. All standard sampling frequencies are supported, from 44.1 kHz to 192 kHz.

### S/PDIF and AES/EBU Connection Kits

In addition to the DMI-2 digital microphone interface, Neumann is now offering attractively priced Connection Kits to permit easy connection of individual miniature microphones to the widely used S/PDIF and AES/EBU interfaces. This makes it possible for numerous users to enjoy "Neumann sound direct to disk", without the extensive functionality of the comprehensive DMI-2. The D-01 microphone can not be operated by a Connection Kit.

An upgrade to the DMI-2, with its configuration capabilities and DSP functions, is of course possible at any time. A plug-in power supply is included as a standard feature. A Battery Pack to permit outdoor operation is also available as an option.

### Attractive Starter Sets for an economical entry into the field of digital microphone technology

Two Starter Sets offer a straightforward introduction to digital microphone technology at a very attractive price. They include a KM 184 D microphone and a Connection Kit for either an S/PDIF or AES/EBU connection. An interesting aspect for those budgeting for future purchases of recording equipment is that an A/D converter is already integrated into the digital Neumann system, and that a preamplifier is not required. Another advantage is the elimination of compatibility considerations. All of the components are available from a single source, so that the Neumann microphone sound can be captured on a digital recording medium with no coloration.

### The DMI-2 digital microphone interface

Equipment that supports the new AES 42 standard can process the output signals of Solution-D microphones directly. In all other cases, the DMI-2 digital microphone interface is used. The DMI-2 is a separate, two-channel device which converts the AES 42 data format supplied by the microphone into an AES/EBU signal.

The DMI-2 is operated via the Neumann RCS remote control software, which is installed on a desktop or laptop computer. The computer is connected to the DMI-2 via a USB port and a USB to RS 485 interface converter. If a large number of microphones is used, several DMI-2s can be cascaded. In this case, each digital microphone interface can be addressed individually.

In addition to a word clock input and output, the DMI-2 also has an internal word clock generator. If no master word clock signal (e.g. from a mixing console) is present at the input, the DMI-2 internal word clock is used automatically to synchronize the two microphone channels, and the signal is switched to the word clock output.

External commands such as "On Air" (red light) can be controlled via a 9-pin user port.

### RCS remote control software

The digital microphones can be controlled via the RCS remote control software, which is a component of the Solution-D system. The software runs as an independent program on a desktop or laptop computer.

All important parameters are displayed on the screen and can be changed at any time. During production, the audio engineer can monitor the operating status and parameters of all connected microphones, and can change the settings quickly and easily if necessary.

The parameters displayed include the directional characteristic, pre-attenuation, low-cut filter, gain, various microphone status indicators, command indicators, and mute and phase reverse functions. It is also possible to monitor signal levels on the screen.

Information transmitted by the microphone, such as the name of the manufacturer, model and serial number, is displayed for clear identification of the microphone. In addition, it is possible to input additional information, such as the name of the sound source. Settings for the complete microphone setup can of course be stored and retrieved as required.



#### TRUE TIME SAVINGS:

Reduced time requirements and personnel costs, particularly due to faster post production processing.



#### TRUE ECONOMY:

Lower investment costs, since separate A/D converters and preamps are no longer needed. This also means space and weight savings (e.g. in the OB van).



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▶ KM D nx<sup>5)</sup>

XLR 3 Cable<sup>1)</sup>  
(not included)

▶ KM D Starter Set - S/PDIF (44.1 or 48 kHz)<sup>3)</sup>



▶ KM D nx<sup>5)</sup>

XLR 3 Cable<sup>1)</sup>  
(not included)

▶ KM D Starter Set - AES/EBU (44.1 or 48 kHz)<sup>3)</sup>



▶ KM D Preset: 44.1, 48 or 96 kHz<sup>3)</sup>  
(other preset frequencies on demand)

XLR 3 Cable<sup>1)</sup>



XLR 3 Cable<sup>1)</sup>

XLR 3 Cable<sup>1)</sup>



XLR 3 Cable<sup>1)</sup>

XLR 3 Cable<sup>1)</sup>

▶ KM D Sampling frequencies 44.1...192 kHz  
(software-selectable)



XLR 3 Cable<sup>1)</sup>

▶ D-01 Sampling frequencies 44.1...192 kHz  
(software-selectable)

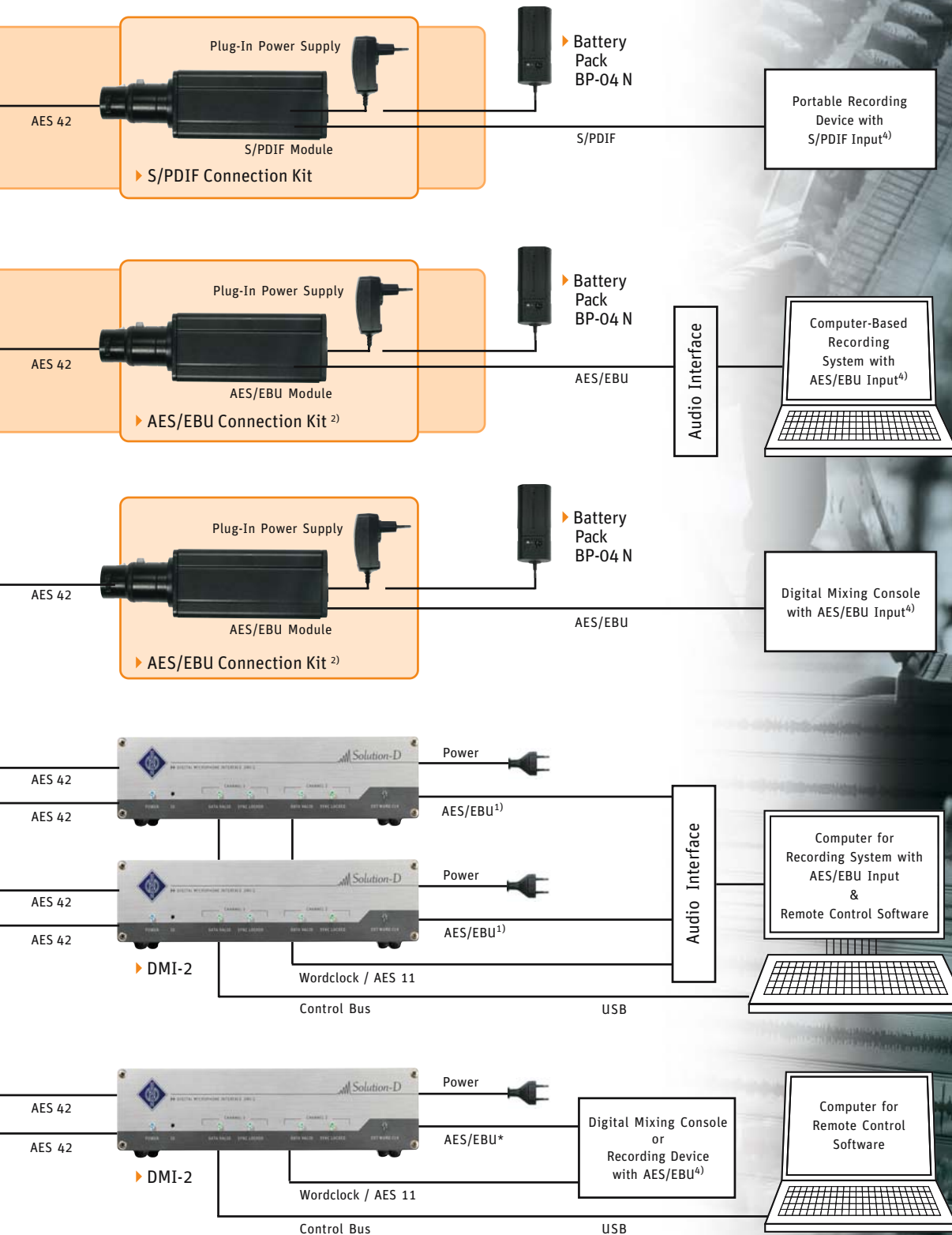
XLR 3 Cable<sup>1)</sup>

<sup>1)</sup> special cable recommended for digital use

<sup>2)</sup> not necessary when using DMI-2

# The Family

Combinations



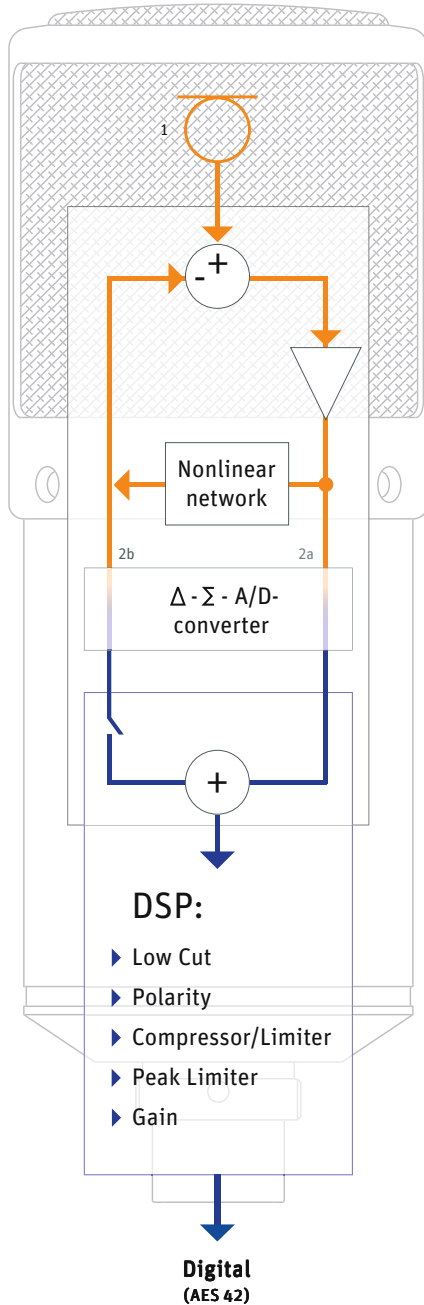
<sup>3)</sup> with the DMI-2 the frequency can be set to 44.1, 48, 88.2, 96, 176.4 or 192 kHz

<sup>4)</sup> these are only examples

<sup>5)</sup> nx = Nextel black



## The Principle



Analog capsule

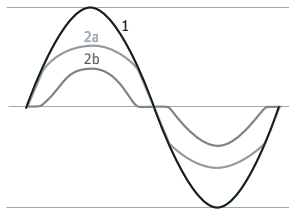
Ideal matching of Neumann A/D-converter with microphone capsule

Neumann A/D converter:

Patented process

Dynamic range  $\geq 140$  dB

The capsule signal is transferred to the digital domain without any loss of quality.



Entire range of functionality remote controlled

Synchronization with studio word clock

Clipping protection



Analog

A/D conversion

DSP

Digital (AES 42)

▶ Recording with no "bottlenecks"



## Toolbox

Components & Sets



▶ BP-04 N Battery Pack (batteries not included)



## Large Diaphragm Microphone



▶ D-01 microphone in wooden box



▶ D-01 Mono Set: D-01, elastic suspension, DMI-2, RCS software, interface converter and all cables, in aluminum case)



▶ D-01 Stereo Set: 2 x D-01, elastic suspensions, DMI-2, RCS software, interface converter and all cables, in aluminum case)

## DMI-2



▶ DMI-2 (incl. RCS software and cables)

## Miniature Microphones



▶ KK 131



▶ KK 143



▶ KK 145



▶ KK 183



▶ KK 184



▶ KK 185



▶ KK 131 nx<sup>1)</sup>



▶ KK 143 nx<sup>1)</sup>



▶ KK 145 nx<sup>1)</sup>



▶ KK 183 nx<sup>1)</sup>



▶ KK 184 nx<sup>1)</sup>



▶ KK 185 nx<sup>1)</sup>



▶ KM 183 D



▶ KM 184 D



▶ KM 185 D

KM 183/184/185 D (nx) are delivered with wind-screen and clamp, also available as stereo sets.

# Toolbox

## Components & Sets



▶ KM D, Preset: 44.1, 48 or 96 kHz<sup>2)</sup>



▶ KM D nx, Preset: 44.1, 48 or 96 kHz<sup>2)</sup>



▶ KM 183 D nx<sup>1)</sup>



▶ KM 184 D nx<sup>1)</sup>



▶ KM 185 D nx<sup>1)</sup>

The screenshot shows the DMI-2 software interface with several windows and controls:

- Ch1 Microphone Properties:** Shows manufacturer (Neumann), model (0-01), serial number (12345678), hardware revision (12.02), software revision (4.10), and delay (50 Samples).
- Ch1 Gain:** A vertical slider set to 0 dB, with options for 60dB, 50dB, 40dB, 30dB, 20dB, 10dB, and 0dB.
- Ch1 Compressor/Limiter:** Shows a ratio of 1.5:1, threshold at -20dBFS, attack time of 0.1 ms, and release time of 50 ms.
- Ch1 System:** Shows microphone power (Mic PWR) and user port mode (RCS) with options for Red, Blue, Mute, and unused.
- Main Interface:** Includes a menu bar (File, Options, Help), a channel name (KM D), a level meter, and various controls like Low Cut (40 Hz), Pre Att (0 dB), Gain (0 dB), Test Sig (off), WordClk (96k), Comp Limiter (1.5:1, -20dBFS, 0.1 ms, 50 ms), Peak Lim (0 dBFS), SYNC (INT, EXT), AES 42 (VAL, PWR), and System (180°, System, +20).

<sup>1)</sup> nx = Nextel black

<sup>2)</sup> With the DMI-2 the frequency can be set to 44.1, 48, 88.2, 96, 176.4 or 192 kHz



### Application Hints

#### D-01

- Universally applicable, and particularly suitable for applications where maximum resolution and transparency are desired.

#### KK 183 + KM D

- For close miking of instruments when there is no need to attenuate extraneous noise, and in a balanced acoustic environment to record acoustic guitar, wind instruments, strings, percussion, drums
- Ideal as AB stereo pair because of the flat frequency response in the diffuse sound field
- Main mic, especially for capturing room acoustics
- For stereo recordings with a baffle plate
- Spot mic for piano, wind instruments, organ, choir

#### KK 184 + KM D

- For universal use, especially for recording situations when it is necessary to attenuate off-axis sound (mainly from the rear) from other nearby instruments.
- As XY and ORTF stereo pair
- Broadcasting mic for announcers
- Spot mic and overhead
- Close miking of strings, wind instruments, percussion, piano, Leslie speakers and guitar amps

#### KK 185 + KM D

- Especially for recording situations when it is necessary to attenuate off-axis (lateral and rear) sound from other nearby instruments.
- As XY stereo pair
- Overhead, toms
- In situations that are susceptible to acoustic feedback
- To attenuate unwanted sound of nearby instruments
- Recording of speech, as in TV, movie and video productions, PA systems
- Produces especially warm and bass supporting sound for artists who perform in proximity effect range

#### KK 131 + KM D

- For close miking of instruments when there is no need to attenuate extra-neous noise, and in a balanced acoustic environment to record acoustic guitar, wind instruments, strings, percussion, and drums
- Flat frequency response for close miking, spot mic

#### KK 143 + KM D

- Polar response characteristic acts more like an omni. Therefore, it is an ideal tool to record larger instrument ensembles
- As AB stereo pair, especially in rooms with less than ideal acoustics
- As spot mic for strings, wind instruments, percussion, and Leslie speakers
- Acts very neutral when used close up to bass instruments, such as double bass, bass amps, guitar amps

#### KK 145 + KM D

- It naturally compensates for proximity effect
- Very neutral tonal balance during close miking of speech, as in TV, movie and video, PA
- Acts very neutral when used close up to bass instruments, such as double bass, bass amps, guitar amps, leslie speakers, toms

### Delivery Range D-01

#### D-01 Microphone:

D-01 Microphone in wooden box

#### D-01 Mono set:

D-01 Microphone  
 DMI-2 Digital Microphone Interface  
 RCS Remote Control Software  
 EA 2 Elastic suspension  
 USB 485 Converter  
 USB cable, RJ 45 patch cable, BNC cable,  
 IC 3 XLR cable, AC line cable  
 Aluminium case

#### D-01 Stereo set:

2x D-01 Microphone  
 1x DMI-2 Digital Microphone Interface  
 1x RCS Remote Control Software  
 2x EA 2 Elastic suspension  
 1x USB 485 Converter  
 1x USB cable, 1x RJ 45 patch cable, 1x BNC cable,  
 1x IC 3 XLR cable, 1x AC line cable  
 1x Aluminium case

### Catalog No. D-01

D-01 Single Microphone .....	ni .....	008482
D-01 Mono set (230 V, EU) .....	ni .....	008473
D-01 Mono set (230 V, UK) .....	ni .....	008477
D-01 Mono set (170 V, US) .....	ni .....	008478
D-01 Stereo set (230 V, EU) .....	ni .....	008479
D-01 Stereo set (230 V, UK) .....	ni .....	008481
D-01 Stereo set (170 V, US) .....	ni .....	008480

## Selection of Accessories D-01

Interface, DMI-2 (230 V, EU) .....	008561
Interface, DMI-2 (230 V, UK) .....	008587
Interface, DMI-2 (117 V, US) .....	008588
Elastic suspension, EA 1 .....	ni ..... 008449
Elastic suspension, EA 1 mt .....	blk ..... 008450
Auditorium hanger, MNV 87 .....	ni ..... 006804
Auditorium hanger, MNV 87 mt .....	blk ..... 006806
Popscreen, PS 15 .....	blk ..... 008472
Popscreen, PS 20 a .....	blk ..... 008488
Microphone cable, IC 3 mt .....	blk ..... 006543

## Delivery Range KM D

### KM 183 D / KM 184 D / KM 185 D:

KM 183 D (nx) ... KM 185 D (nx) microphone  
 WNS 100 windscreen  
 Stativgelenk SG 21/17 mt  
 Wooden box

### KM D Starter sets:

KM 184 D nx (44.1 oder 48 kHz) microphone  
 WNS 100 Windscreen  
 SG 21/17 mt Stand mount swivel  
 Connection Kit (S/PDIF or AES/EBU)  
 Wooden box

### Delivery Range KM D Stereo Sets

2x KM 183 D (nx) ... KM 185 D (nx) microphone  
 2x WNS 100 Windscreen  
 2x SG 21/17 mt Stand mount swivel  
 Wooden box

## Catalog No. KM D

KM 183 D .....	ni ..... 008553
KM 183 D nx .....	nx ..... 008554
KM 183 D stereo set .....	ni ..... 008572
KM 183 D nx stereo set .....	nx ..... 008573
KM 184 D .....	ni ..... 008555
KM 184 D nx .....	nx ..... 008556
KM 184 D stereo set .....	ni ..... 008574
KM 184 D nx stereo set .....	nx ..... 008575
KM 185 D .....	ni ..... 008557
KM 185 D nx .....	nx ..... 008558
KM 185 D stereo set .....	ni ..... 008576
KM 185 D nx stereo set .....	nx ..... 008577
Starter Set S/PDIF (44.1 kHz) .....	nx ..... 008564
Starter Set S/PDIF (48 kHz) .....	nx ..... 008565
Starter Set AES/EBU (44.1 kHz) .....	nx ..... 008562
Starter Set AES/EBU (48 kHz) .....	nx ..... 008563

## Selection of Accessories KM D

Output Stage KM D (44.1 kHz) .....	ni ..... 008578
Output Stage KM D nx (44.1 kHz) .....	nx ..... 008581
Output Stage KM D (48 kHz) .....	ni ..... 008579
Output Stage KM D nx (48 kHz) .....	nx ..... 008582
Output Stage KM D (96 kHz) .....	ni ..... 008580
Output Stage KM D nx (96 kHz) .....	nx ..... 008583
Capsule head, KK 131 .....	ni ..... 008591
Capsule head, KK 131 nx .....	nx ..... 008592
Capsule head, KK 143 .....	ni ..... 008593
Capsule head, KK 143 nx .....	nx ..... 008594
Capsule head, KK 145 .....	ni ..... 008595
Capsule head, KK 145 nx .....	nx ..... 008596
Capsule head, KK 183 .....	ni ..... 008566
Capsule head, KK 183 nx .....	nx ..... 008567
Capsule head, KK 184 .....	ni ..... 008568
Capsule head, KK 184 nx .....	nx ..... 008569
Capsule head, KK 185 .....	ni ..... 008570
Capsule head, KK 185 nx .....	nx ..... 008571

Connection Kit AES/EBU .....
 008584 |

Connection Kit S/PDIF .....
 008585 |

Interface, DMI-2 (230 V, EU) .....
 008561 |

Interface, DMI-2 (230 V, UK) .....
 008587 |

Interface, DMI-2 (117 V, US) .....
 008588 |

Battery Pack, BP-04-N .....
 008586 |

Elastic suspension, DA-KM .....
 blk ..... 008420 |

Elastic suspension, EA 2124 A mt .....
 blk ..... 008433 |

Table stands, MF 2 .....
 blk ..... 007266 |

Table stands, MF 3 .....
 blk ..... 007321 |

Auditorium hanger, MNV 21 mt .....
 blk ..... 006802 |

Double mount, DS 120 .....
 blk ..... 007343 |

Stand mount, SG 21/17 mt .....
 blk ..... 006149 |

Windscreen, WKD-KM .....
 gr ..... 008424 |

Windjammer, WJ-KM .....
 gr ..... 008426 |

Foam windscreen, WNS 100 .....
 blk ..... 007323 |

Foam windscreen, WNS 110 .....
 blk ..... 008535 |

Foam windscreen, WNS 120 .....
 blk ..... 008427 |

Foam windscreen, WS 100 .....
 blk ..... 006751 |

Popscreen, PS 15 .....
 blk ..... 008472 |

Microphone cable, IC 3 mt .....
 blk ..... 006543 |

Microphone cable, IC 31 mt .....
 blk ..... 006570 |

A complete survey and detailed descriptions of all accessories are contained in the accessories catalog

Meaning of color codes:

ni = nickel, nx = nextel black, blk = black, gr = grey



### ▶ General Specifications of the Solution-D microphones

Interface: AES 42

Remote controlled<sup>1)</sup> functions:

- Polar pattern<sup>2)</sup>
- Low-cut: flat, 40, 80, 160 Hz
- Pre-attenuation: 0, -6, -12, -18 dB
- Gain: 0...63 dB in 1 dB steps, clickless
- Testsignal: 1 kHz, pink noise, white noise
- Parametric compressor/limiter (incl. de-esser function)
- Independent peak limiter avoiding any clipping
- Switch functions: soft muting, phase reverse, signal lights
- Signal lights: red<sup>5)</sup> and blue LEDs (switchable via control software or User Port)

A/D conversion: Neumann process (patented), 28-bit internal word length

Digital signal processing: Fixed-point, variable internal word length 28 bits to 60 bits

Synchronization:

AES 42-Mode 2, Mode 1 (asynchronous), Asynchronous operation (free-running), basic frequency accuracy:  $\pm 25$  ppm Synchronous operation, pull-in range: Min.  $\pm 100$  ppm Power supply (phantom power complying with AES 42) Supply voltage range: +7 V to +10,5 V

Output: XLR3M, 24 bits as per AES/EBU (AES 3)

### ▶ KM D + KK 183 / 184 / 185 Specifications

Acoustic transducer: KK 183/184/185 (known from Series 180)  
Directional characteristic: Omni/cardiod/hypercardiod

Frequency response: 20 Hz to 20 kHz  
Free-field sensitivity<sup>2) 3)</sup>: -41/-39/-42 dBFS  
Equivalent noise level, CCIR<sup>4)</sup>: 25/22/25 dB  
Equivalent noise level, A-weighted<sup>4)</sup>: 13/13/16 dB-A  
Signal-to-noise ratio<sup>3)</sup>, CCIR<sup>4)</sup>: 69/70/69 dB  
Signal-to-noise ratio<sup>3)</sup>, A-weighted<sup>4)</sup>: 81/81/78 dB  
Maximum SPL at 0 dBFS: 135/133/136 dB SPL

Sampling rates:

Preset: 44.1, 48 or 96 kHz  
(with DMI-2 switchable: 44.1/48/88.2/96/176.4/192 kHz)

Preset Gain: 10 dB (variable with DMI-2)

Current consumption: max. 150 mA  
Weight: approx. 80/84/88 g, Diameter: 22 mm, Length: 108 mm

### ▶ KM D + KK 131 / 143 / 145 Specifications

Acoustic transducer: KK 131/143/145  
Directional characteristic: Omni free field equalized/cardiod wide angle/ cardioid low frequency roll-off

Frequency response: 20 Hz to 20 kHz  
Free-field sensitivity<sup>2) 3)</sup>: -41/-39/-40 dBFS  
Equivalent noise level, CCIR<sup>4)</sup>: 24/24/24 dB  
Equivalent noise level, A-weighted<sup>4)</sup>: 13/13/14 dB-A  
Signal-to-noise ratio<sup>3)</sup>, CCIR<sup>4)</sup>: 70/70/70 dB  
Signal-to-noise ratio<sup>3)</sup>, A-weighted<sup>4)</sup>: 81/81/80 dB  
Maximum SPL at 0 dBFS: 135/133/134 dB SPL

Sampling rates:

Preset: 44.1, 48 or 96 kHz  
(with DMI-2 switchable: 44.1/48/88.2/96/176.4/192 kHz)

Preset Gain: 10 dB (variable with DMI-2)

Current consumption: max. 150 mA  
Weight: approx. 80/84/88 g, Diameter: 22 mm, Length: 108 mm

### ▶ D-01 Specifications

Acoustic transducer: K 07 large double-diaphragm capsule, diameter 30 mm with protected internal electrodes  
Directional characteristic: 15 remote controllable polar patterns, from omni to cardioid to figure-8

Frequency response: 20 Hz to 20 kHz  
Free-field sensitivity<sup>2) 3)</sup>: -44 dBFS  
Equivalent noise level, CCIR<sup>4)</sup>: 19 dB

Equivalent noise level, A-weighted<sup>4)</sup>: 8 dB-A

Signal-to-noise ratio<sup>3)</sup>, CCIR<sup>4)</sup>: 75 dB

Signal-to-noise ratio<sup>3)</sup>, A-weighted<sup>4)</sup>: 86 dB

Maximum SPL at 0 dBFS: 138 dB SPL

Dynamic range, A-weighted<sup>4)</sup>: 130 dB

Sampling rates: 44.1, 48, 88.2, 96, 176.4, 192 kHz

Current consumption: max. 230 mA

Weight: approx. 700 g, Diameter: 63.5 mm, Length: 185 mm

### ▶ DMI-2 (Digital Microphone Interface) Specifications

2 channels, Inputs: XLR3F, AES 42

Outputs: XLR3M, AES/EBU, 24 bit

Control bus: RS485 via RJ 45 jack. Second RJ 45 jack for cascading purposes (up to 4 DMI devices today, 16 devices in future). Connection to the computer's USB port via Neumann USB485 interface converter (included).

User Port: 9-pin sub-D, 3 functions per channel

Synchronization: AES 42 - Mode 2 (PLL system using an external Word Clock and remote controlling the VCXO in the microphone, default mode), AES 42 - Mode 1, (asynchronous, needs a sample rate converter (SRC) at the receiver side).

Word clock input: BNC, 75 ohms.

Word clock output: BNC, 75 ohms, automatically set to the internal word clock master when no external word clock received. Selectable internal sampling rates: 44.1, 48, 88.2, 96, 176.4, 192 kHz.

External Word clock: 44.1, 48, 88.2, 96, 176.4, 192 kHz or AES 11 format.

Indicators: Data Valid (AES 42) and Sync Locked (Mode 2) for each channel, Power On and Ext. Word Clock.

Power supply: 90-240 V, 50/60 Hz.

Storage of the last microphone settings and reloading to the microphones after power on automatically without the need of the computer/RCS.

### ▶ Features of the RCS (Remote Control Software)

Communication via USB port (Win 2000/98SE/ME/XP, MAC OS version 8.6...10 on PowerPC)

Up to 8 channels displayed simultaneously on the screen

Controllable functions: polar pattern, low-cut, pre-attenuation, gain, test signals, limiter/compressor/de-esser, peak limiter, phase reverse, mute, sampling rate, synchronization mode, signal lights,...

Display: peak level meter, gain reduction meter for compressor/limiter/de-esser and peak limiter, microphone properties (manufacturer, model, serial number, hardware and software revision, internal latency time), DMI properties, status signals (overload, limiter active, data valid, sync locked, power on)

Saving/Loading of configurations

Individual channel labelling

Software update of Neumann microphones and DMI device

### ▶ Battery Pack BP 04 N Specifications

4 AA (rechargeable) batteries (not included)

Weight: approx. 84 g (without batteries)

Diameter: 43 mm, Length: 105 mm

### ▶ Connection Kit S/PDIF (AES/EBU) Specifications

Connector: input XLR3F, output Cinch (XLR3M)

Weight: approx. 96 g (S/PDIF), approx. 130 g (AES/EBU)

Width: 32 mm, Height: 26 mm, Length: 105 mm

Power supply: 90-240 V, 50/60 Hz

For remote controlling functions you have to use the DMI-2

All data with respect to 0 dB pre-attenuation and 0 dB gain.

<sup>1)</sup> Remote control with DMI-2 only

<sup>2)</sup> at 1 kHz

<sup>3)</sup> re 94 dB SPL

<sup>4)</sup> according to IEC 60268-1;

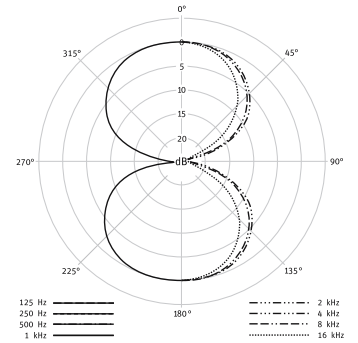
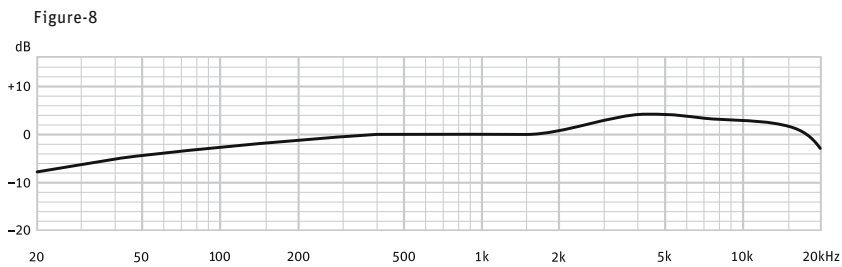
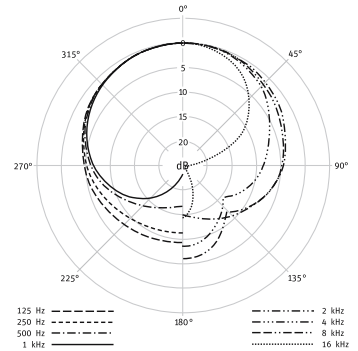
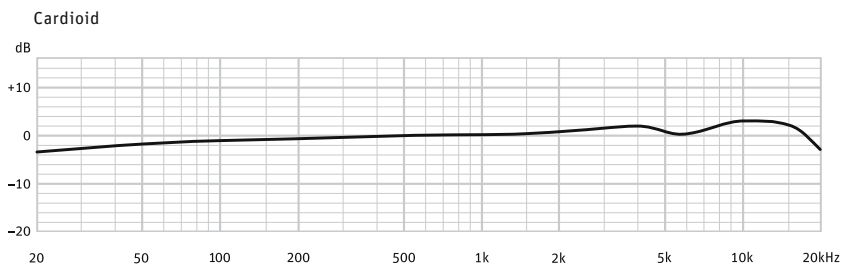
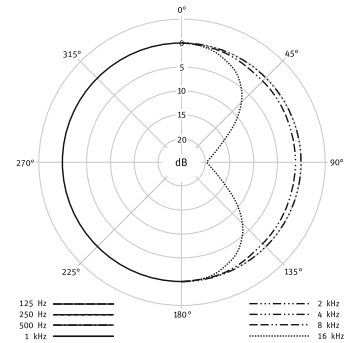
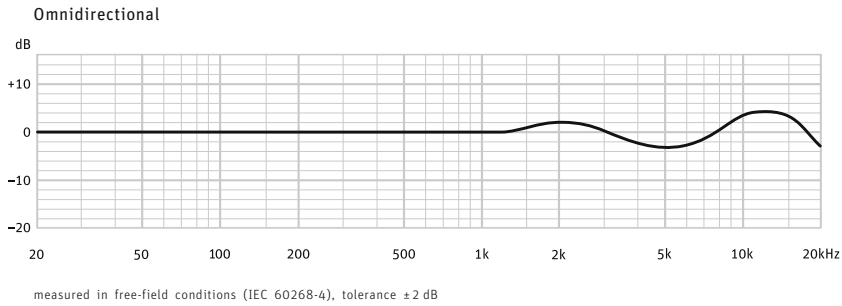
CCIR-weighting according to CCIR 468-3, quasi peak;

A-weighting according to IEC 61672-1, RMS

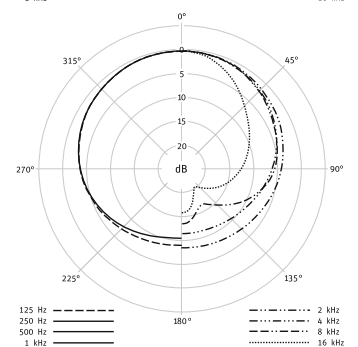
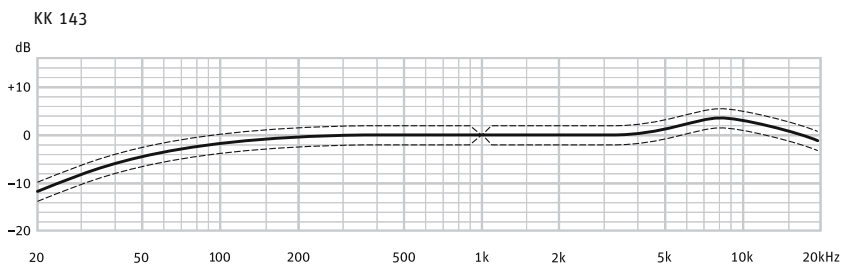
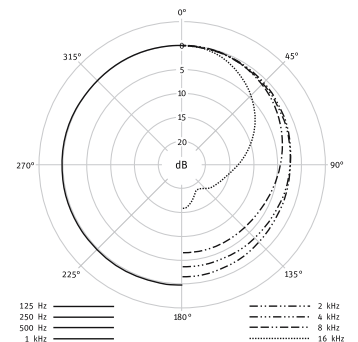
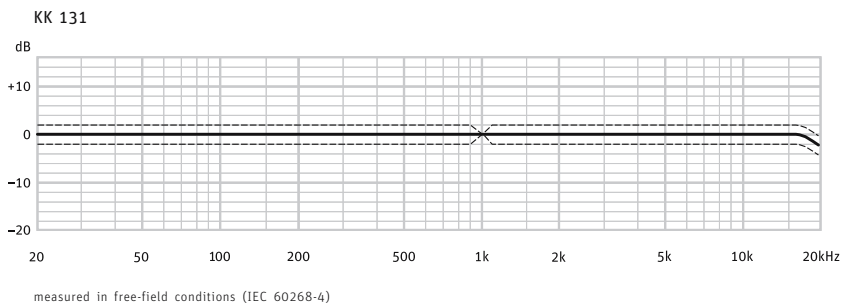
<sup>5)</sup> D-01 only

# Diagrams

► D-01



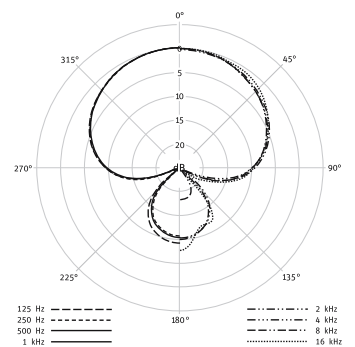
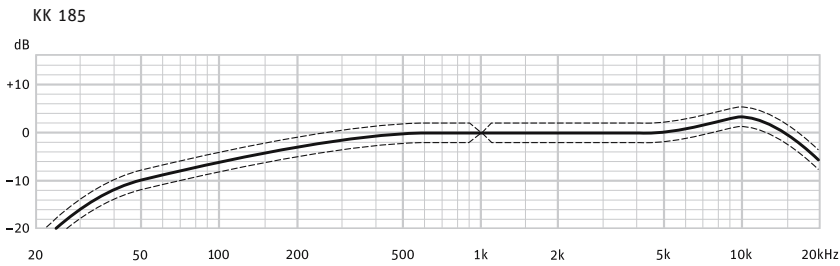
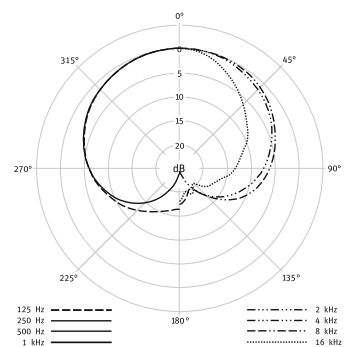
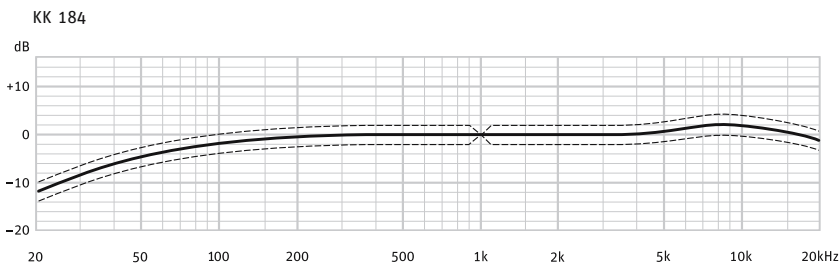
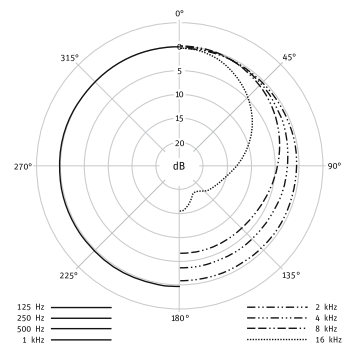
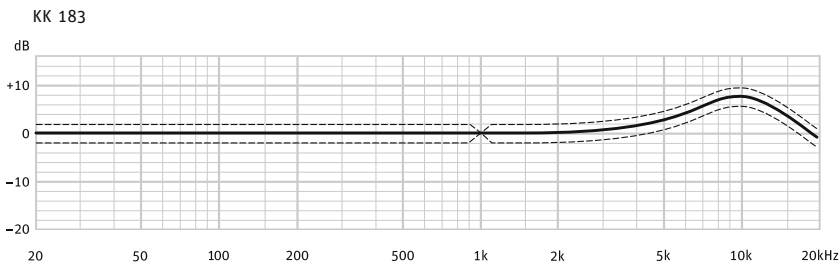
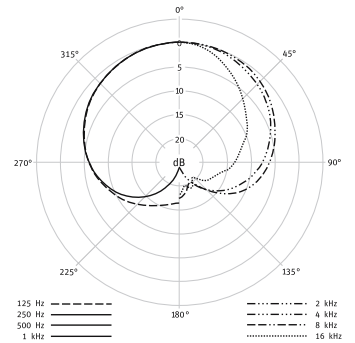
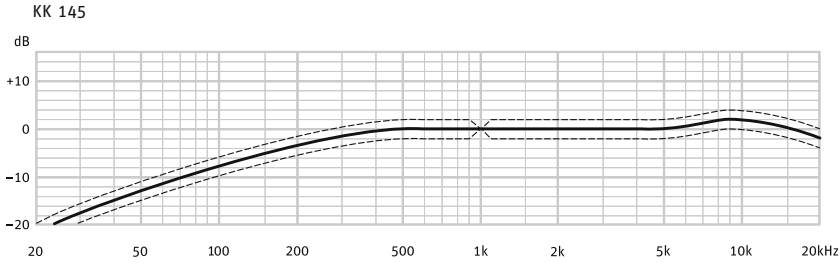
► KM D + KK...





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Errors excepted, subject to changes • Printed in Germany • Publ. 01/2008 515967/A03  
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