



P 64

DIGITAL AUDIO MATRIX MANAGER

Mobile Audio | Concert Sound | Fixed Installation | Pro Entertainment



DYNACORD
GERMAN ENGINEERING EXCELLENCE



P 64 Digital Audio Matrix Manager

WITH IRIS-NET SOFTWARE APPLICATION

■ **The P 64 Digital Audio Matrix Manager is a modular, network-compatible and freely configurable audio system controller that allows designing complete system solutions.**

In the DSP, any structures with up to 32 audio channels are freely configurable. This is possible by the wide variety of different DSP blocks available, such as mixer,

matrix, dynamics, crossover, EQ, and even FIR filters. The processing power of the DSP can be further increased with extension cards. Freely expanding the hardware configuration as well is possible through four module slots located on the rear of the P 64. These slots can be equipped with 8-channel digital or analog input or output boards; even a special microphone input card is available.



Several P 64s can be interconnected via a CobraNet network, which allows operation and supervision of even the largest decentralized audio systems. Integrated control and logic functions ensure that complex operations can be carried out without problem.

It is for example possible to link various parameters to each other in a Task Engine using logic and arithmetic functions

and apply the results to an arbitrary number of other parameters. This also provides the possibility for time-controlled operations.

Faults in and breakdown of the P 64 Manager itself and all devices integrated in the system are detected automatically. An according message can be output via control contacts, other interfaces or displayed on the PC screen.



THE P 64 PROVIDES OUTSTANDING AUDIO QUALITY (S/N RATIO > 115 DB); THE NEWEST IN A/D AND D/A CONVERTER TECHNOLOGY AND ELABORATE DSP ALGORITHMS ENSURE TRANSPARENT SOUND REPRODUCTION.



■ DYNAMIC DSP POWER

The wide variety of DSP blocks available, such as EQs, filter (incl. FIR), mixer, matrix/router, dynamics, crossover, delays, loudspeaker-controller and signal generators, determine the processing power needed.

The modular concept of the P64 makes it possible to adjust the configuration in an ideal fashion to meet the requirements imposed. With each of the 8-channel input or output modules, the processing power of the P64 is raised by a further 100 MIPS (million instructions per second). With the DSP-1 expansion card, the processing power is increased by a further 300 MIPS. A wide variety of applications in the fixed installation or concert sound fields can therefore be realized in the highest audio quality with great flexibility.

■ DSP-1

The DSP-1 is a DSP extension module for use in a DYNACORD P64.

The module is armed with additional DSPs to expand the signal processing

capacity as well as RAM storage banks for the realization of longer delay times or additional delay lines.

■ ADDITIONAL CHARACTERISTICS:

- 300 MIPS processing capacity – doubling the DSP processing power
- 2 RAM banks (512K x 24bits) – for additional delay lines up to 21.8 sec.
- 48-bit signal processing – double-precision DSP algorithms.
- Automatic configuration – reporting in IRIS-Net when new module was loaded or module was removed.

■ P64 – 1500 (SET)

With the P64-1500, the internal expansion slot gets equipped with a DSP-2 card which is part of the set.

As a result of the 3 additional dual-core processors on the DSP-2 card, the signal processing capacity is considerably increased. At the same time, applications requiring long delay times (e.g. for delay lines) benefit from the additional RAM. The P64-1500 is therefore outstandingly well suited to com-

plex tasks and the implementation of processor-intensive FIR algorithms.

With its processing power of 1500 MIPS (with input/output modules max. 1900 MIPS), the P64-1500 is currently the most powerful pro audio processor.

■ DSP-2

DSP expansion module forming part of the P64-1500 Set.

The module is armed with additional DSPs to expand the signal processing capacity as well as RAM storage banks for the realization of longer delay times or additional delay lines.

■ ADDITIONAL CHARACTERISTICS:

- 1200 MIPS processing capacity
- 3 RAM banks (512K x 24bits) – for additional delay lines up to 32.7 sec
- 48-bit signal processing – double-precision DSP algorithms
- Automatic configuration – reporting in IRIS-Net when new module was loaded or module was removed



P 64 DIGITAL AUDIO MATRIX

AUDIO CHANNELS SLOT 1

AUDIO 2

1 2 3 4 5 6 7 8

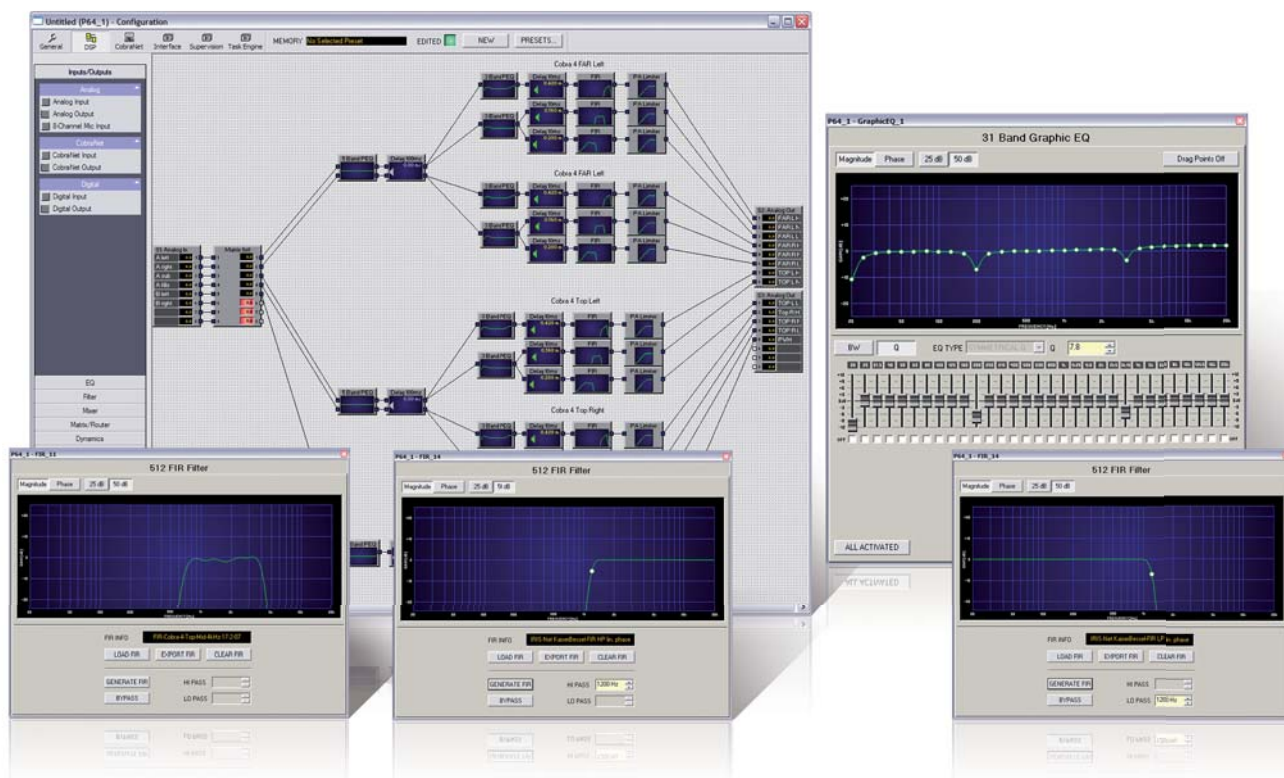
PEAK

0 0 0 0 0 0 0 0

SIGNAL

0 0 0 0 0 0 0 0

P 64 and IRIS-Net
HIGH END LIVE APPLICATIONS



IRIS-Net

SOFTWARE

The P 64 Manager runs under IRIS-Net, which is by far more than a common configuration software application, because IRIS-Net is also capable of controlling and supervising all compatible components.

IRIS-Net integrates all devices of the manufacturer that can be configured and/or remotely controlled via PC in a comprehensive audio system: in 2006 DYNACORD introduced a new series of IRIS-Net-compatible amplifiers – the Power-H – followed by the P 64 Matrix Manager. Our current product range is completed through the integration of the DYNACORD DCS System which offers extended control and monitoring functionality.

Easy and comfortable operation is guaranteed through PWS programmable wall stations and TPI touch panels. The universality and

flexibility of the IRIS-Net software application is one of the major strengths of the DYNACORD Digital Audio System – the complete audio system including all its components can be configured, controlled, and monitored using one single software application. IRIS-Net supports Ethernet, CobraNet, CAN-Bus, USB and, because of its open architecture, IRIS-Net is ready for future implementations.

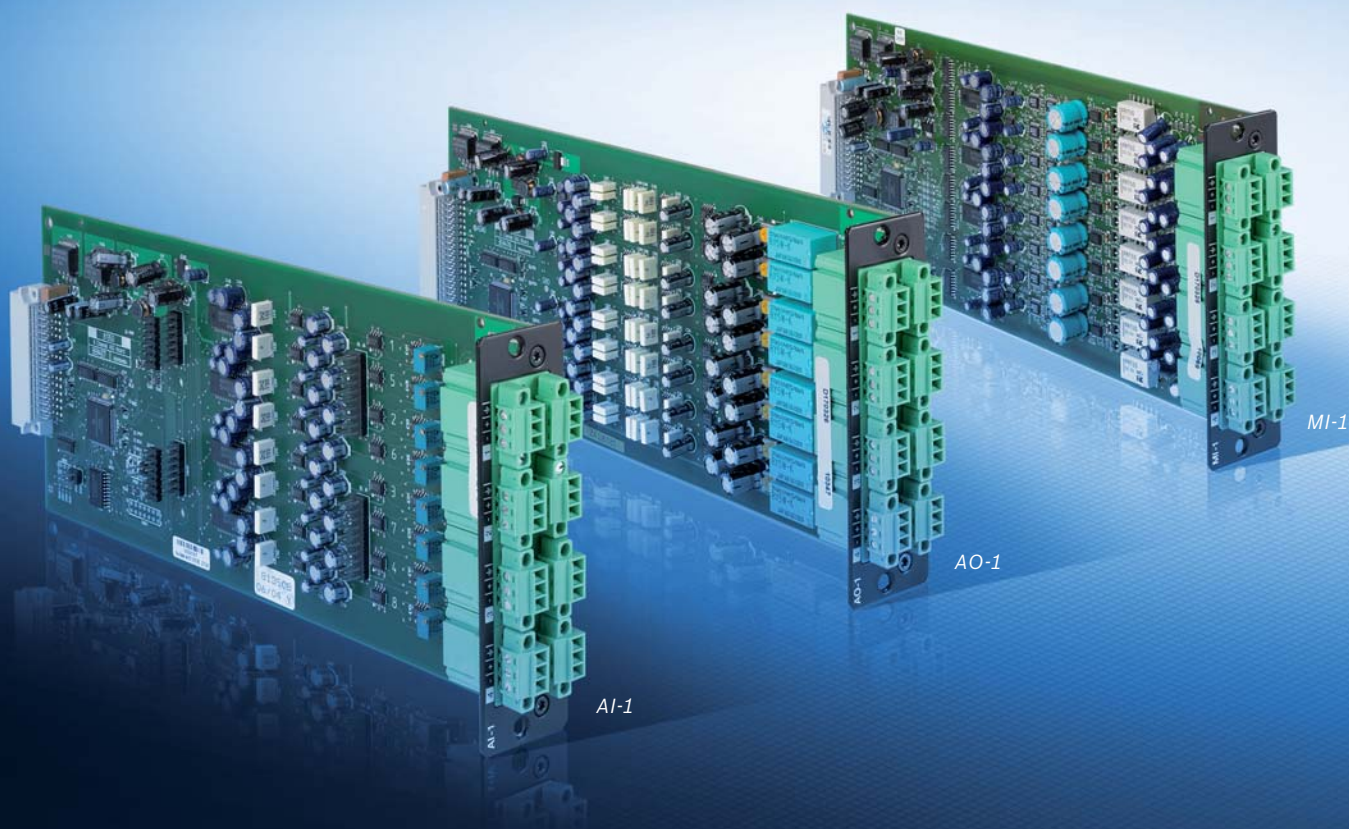
IRIS-Net is also suitable for the realization of security-relevant systems – even stadiums or airports – where life safety levels not only require the complete monitoring and surveillance of the connected devices themselves but also of connection cables, interfaces, and connected loudspeaker systems.

The “System Check” in particular is one distinctive feature that runs a precise impedance sweep of all

loudspeaker systems in the system by the push of a button. Besides detecting failure of complete loudspeaker systems, this also ensures that damage of a single speaker chassis is being detected. System status is queried continuously, fault conditions are recognized and reported and a protocol lists incidents by date and time.

Operation of the DYNACORD Digital Audio System using IRIS-Net takes place in real-time via wall stations, touch panels, PC or even media control units. The change of a parameter at one of the control units is simultaneously indicated at all other control units.

Typical applications are for example: hotels, gymnasiums and multi-purpose facilities, cruise liners or sports arenas, but also live-concerts, clubs or open-air festivals.



I / O Cards

■ **The finest audio performance in the widest range of audio formats is available to users of the P64. Analogue audio signals –microphone or line level–can be processed as well as digital audio signals in different formats.**

High-quality converters in the expansion modules ensure optimal audio quality at all times. In addition, the CM-1 module permits the distribution of audio signals over an Ethernet network. All modules are recognized automatically by the system and managed via the IRIS-Net software.

■ **AI-1**
The AI-1 is an 8-channel analog input module for use in a DYNACORD P 64 system.

Audio signal connection is established via screw-lockable Euro

block connectors. A/D conversion is taken care of by high-performance, linear, 24-bit converters while internal signal processing is performed in 48-bit word length.

117 dB dynamic range - for superior audio performance without spurious noise. Balanced inputs – high Common Mode Rejection prevents long cables from picking up interference.

■ **MI-1**
Das MI-1 is an 8-channel microphone input module for use in a DYNACORD P 64 system.

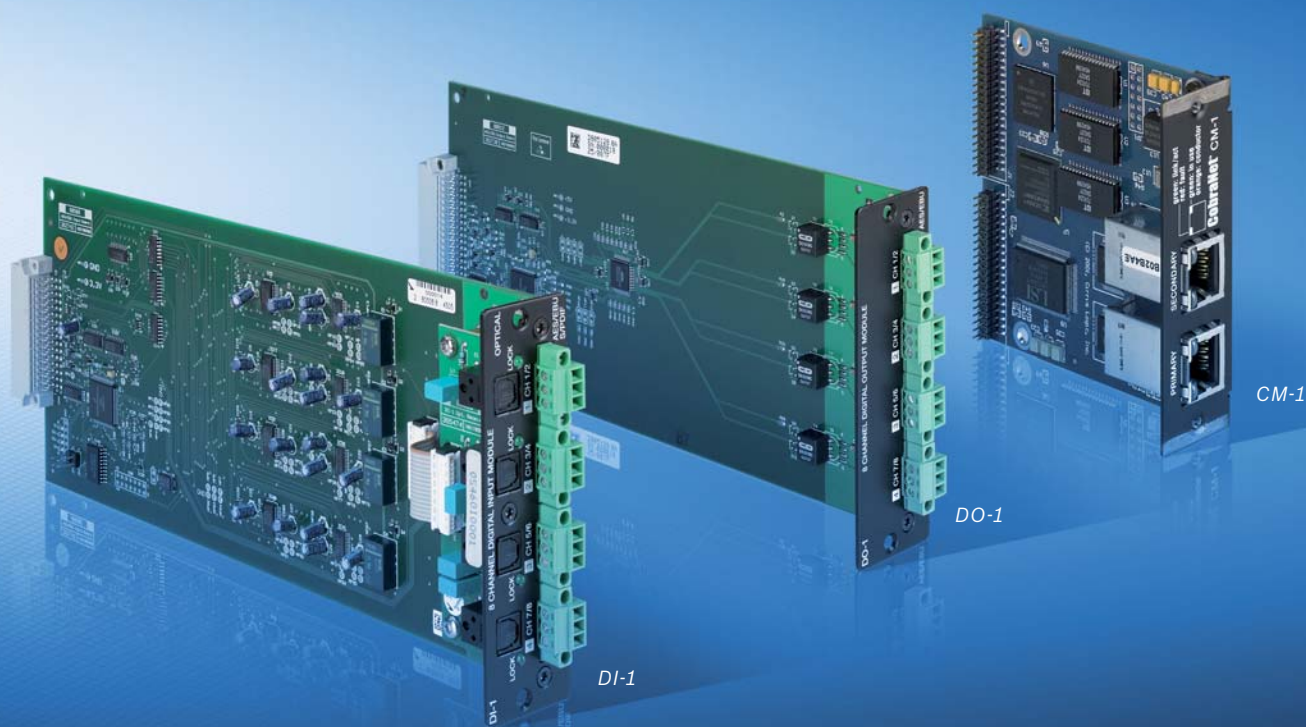
The connection of microphone or Line level signals is established via screw-lockable Euro block connectors. A/D conversion is taken care of by high-performance, linear, 24-bit converters while signals are processed internally in 48-bit word

length. 118 dB dynamic range – for superior audio performance without spurious noise.

Balanced inputs – high Common Mode Rejection prevents long cables from picking up interference. Gain, PAD, phantom power – programmable input gain in steps of 6 dB, switchable PAD for Line level feeds, and +48V phantom power switchable via software.

■ **AO-1**
Das AO-1 is an 8-channel analog output module for use in a DYNACORD P 64 system.

The module outputs eight high-quality audio signals via screw-lockable Euro block connectors. Internal signal processing is performed in 48-bit word length while high-performance 24-bit converters take care of D/A conversion.



118 dB dynamic range – for superior audio performance without spurious noise.

100 ohms balanced output driver – lossless signal distribution to several parallel inputs, even over longer cable runs. Output relays – power-on delay and quick disconnection for effective suppression of power-on/off noise.

■ DI-1

The DI-1 is an 8-channel digital input module for use in a DYNACORD P 64 system.

Digital audio signals in AES/EBU or S/PDIF formats are connected via screw-lockable Euro block connectors. Additional Toslink inputs allow for the optical transmission of digital audio signals. All inputs of the DI-1 module employ high-quality sample rate converters.

Internal signal processing is performed in 48-bit word length.

128 dB dynamic range – for superior audio performance without spurious noise. Sample rates of 32 - 192 kHz – connection of basically any digital audio signal source. Sample rate converter per input – allows the connection of digital audio signal sources even with different sample rates.

■ DO-1

The DO-1 is an 8-channel digital output module for use in a DYNACORD P 64 system.

Digital audio signals (48 kHz sample rate) are output via screw-lockable Euro block connectors. Internal signal processing is performed in 48-bit word length. 144 dB dynamic range – for superior audio performance.

■ CM-1

CobraNet is a network technology for multi-channel transmission of digital audio data.

The CM-1 is a compact interface module for connection to a CobraNet network, allowing the simultaneous transmission of up to 32 digital audio input signals and 32 digital audio output signals.

- 100BASE-TX Ethernet interface
- Secondary 100BASE-TX
- Ethernet interface
- Four serial output ports
- Four serial input ports
- Status LEDs

Technical Specifications

| General | P 64 |
|------------------------------------|--|
| Power Supply, Consumption | 100 - 240 V AC, 50/60 Hz, 90 W max., (incl. 2 x AI-1, 2 x AO-1, 1 x CM-1 modules) |
| Audio Slots | 4 (for AI-1, AO-1, MI-1, DI-1 and/or DO-1 modules) |
| Network Slots | 1 (for CM-1 module) |
| Interfaces | Ethernet 10/100 MBit/s (1 x RJ-45), CAN Bus (2 x RJ-45), RS-232 (2 x 9pin D-Sub), USB (Type B, front) |
| GPIO Control Port | 2 x 6-pole Euro block, 4 Control Inputs (analog 0-10 V / logic control), 3 Control Outputs (Relay contact to ground), 1 Fault Output (NC Relay contact), 2 Reference Outputs (+10 V, 200 mA / GND) |
| Signal Processing | 2 DSPs Standard (150 MHz, 300 MIPS), 1 DSP per Audio Module (100 MHz, 100 MIPS) DSP-1 Extension Module optional (+300 MIPS), DSP-2 Extension Module optional (+1200 MIPS) |
| Sample Rate | 48 kHz internal, 32 kHz - 192 kHz external |
| Data Format | 24 Bit linear A/D conversion, 48 Bit processing |
| Operating Temperature Range | 0 °C...40 °C |
| Dimensions (W x H x D) | 483 x 88.1 x 381 mm (19", 2 HU) |
| Weight | 7.35 kg |

| General | AO-1 | DO-1 | CM-1 |
|---|---|--|--|
| Supply Voltage / Current | +3.3 V DC, ± 0.3 V / 140 mA +5 V DC, ± 0.25 V / 190 mA +18 V DC, ± 0.5 V / 270 mA -18 V DC, ± 0.5 V / 160 mA | +3.3 V DC, ± 0.3 V / 130 mA +5 V DC, ± 0.3 V / 100 mA | +3.3 V DC, ± 0.3 V / 1.2 A +5 V DC, ± 0.25 V / 100 mA |
| Audio Inputs | 8 x 3-pole Euro block connectors, electronically symmetric | 8 x 3-pole Euro block connectors, electronically symmetric | - |
| Output Format | - | AES/EBU Professional Format | - |
| Output Impedance | - | 110 Ω | - |
| Output Level (nominal) | +6 dBu / 1.55 V | - | - |
| Output Level (max. before clip) | +21 dBu / 8.7 V | - | - |
| Output Impedance | 100 Ω | - | - |
| Min. Load Impedance | 600 Ω | - | - |
| D/A Conversion | 24 Bit, Sigma-Delta, 128 times oversampling | - | - |
| Frequency Response | 20 Hz...20 kHz (-0.5 dB) | 20 Hz...20 kHz (± 0.1 dB) | - |
| Signal to Noise Ratio (A-weighted) | 118 dB typical | 144 dB typical | - |
| THD+N | < 0.005 % | < 0.00002 % | - |
| Output Sample Rate | - | 48 kHz | - |
| Ethernet Connectors (Primary / Secondary) | - | - | RJ-45, integrated transformer isolation, IEEE 802.3u standard |
| Sample Rate | 48 kHz | - | 48 kHz |
| Data Format | 24 Bit linear D/A conversion, 48 Bit processing | 24 Bit linear, 48 Bit processing | 16 / 20 / 24 Bit |
| Signal Delay | 0.646 ms | 0.0625 ms | - |
| Latency across network | - | - | 1.33 / 2.66 / 5.33 ms selectable |
| Operating Temperature Range | 0 °C...40 °C | 0 °C...40 °C | 0 °C...40 °C |
| Dimensions (W x H x D) | 114 x 33 x 258.5 mm | 114 x 33 x 258.5 mm | 89 x 27 x 92 mm |
| Weight | 260 g | 170 g | 75 g |

| General | AI-1 | MI-1 | DI-1 |
|--|--|---|--|
| Supply Voltage / Current | +3.3 V DC, ± 0.3 V / 35 mA +18 V DC, ± 0.5 V / 360 mA -18 V DC, ± 0.5 V / 105 mA | +3.3 V DC, ± 0.3 V / 180 mA +5 V DC, ± 0.3 V / 1 A +18 V DC, ± 0.5 V / 400 mA -18 V DC, ± 0.5 V / 150 mA | +3.3 V DC, ± 0.3 V / 330 mA +5 V DC, ± 0.3 V / 100 mA |
| Audio Inputs | 8 x 3-pole Euro block connectors, electronically symmetric | 8 x 3-pole Euro block connectors, electronically symmetric | - |
| Digital Audio Inputs | - | - | 4 x 3-pole Euro block connectors 4 x Toslink optical connectors |
| Input Formats | - | - | AES/EBU, S/PDIF, Optical |
| Input Level (nominal) | +6 dBu / 1.55 V | +6 dBu / 1.55 V | - |
| Input Level (max. before clip) | +21 dBu / 8.7 V | Mic: +21 dBu / 8.7 V Line: +39 dBu / 69 V | - |
| Input Sensitivity (6 dBu Output, Input Level Control +18 dB) | - | Mic: -72 dBu / 195 μ V Line: -54 dBu / 1.55 mV | - |
| Sample Rate Conversion (SRC) | - | - | High End Sample Rate Converter per channel 32...192 kHz input to 48 kHz output |
| Input Impedance | 20 k Ω | Mic: 2 k Ω , Line: 8 k Ω | AES/EBU: 110 Ω S/PDIF: 75 Ω |
| Common Mode Rejection | > 70 dB | Mic: > 75 dB (1 kHz) Line: > 60 dB (1 kHz) | - |
| Equivalent Input Noise (EIN) | - | 129 dBu (A-weighted, 150 Ω source) | - |
| Phantom Power | - | +48 V / 10 mA, independently switchable per channel | - |
| A/D Conversion | 24 Bit, Sigma-Delta, 128 times oversampling | 24 Bit, Sigma-Delta, 128 times oversampling | - |
| Frequency Response | 20 Hz...20 kHz (-0.5 dB) | 20 Hz...20 kHz (-0.5 dB) | 20 Hz...20 kHz (± 0.1 dB) |
| Signal to Noise Ratio (A-weighted) | 117 dB typical | 118 dB typical | 128 dB typical |
| THD+N | < 0.005 % | < 0.005 % | < 0.0001 % |
| Input Sample Rate | - | - | 32...192 kHz |
| Sample Rate | 48 kHz | 48 kHz | - |
| Data Format | 24 Bit linear A/D conversion, 48 Bit processing | 24 Bit linear A/D conversion, 48 Bit processing | 24 Bit linear PCM inputs, 48 Bit processing |
| Signal Delay | 1.3958 ms | 1.3958 ms | Low Group Delay Mode: 2.355 ms @ 48 kHz Input 1.588 ms @ 96 kHz Input High Group Delay Mode: 3.022 ms @ 48 kHz Input 1.922 ms @ 96 kHz Input External Sync / SRC Bypass Mode: 0.126 ms @ 48 kHz Input |
| Operating Temperature Range | 0 °C...40 °C | 0 °C...40 °C | 0 °C...40 °C |
| Dimensions (W x H x D) | 114 x 33 x 258.5 mm | 114 x 33 x 258.5 mm | 114 x 33 x 258.5 mm |
| Weight | 200 g | 250 g | 200 g |

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