

Genelec S30D
Digital Monitoring System



S30D Digital Monitoring System



Main features:

- AES/EBU digital audio and analog audio inputs in a single speaker system
- Digital audio thru
- 96 kHz / 24-bit digital audio interface
- 50 kHz audio output bandwidth for monitoring of 96 kHz digital audio
- Automatic detection of word length and sampling rate
- Perfect level match throughout the system from D/A converter to power amplifier outputs
- Standard sound level conversion
- High system integration

SYSTEM

The Genelec S30D is a three-way Digital Monitoring System including a digital audio interface, balanced analog audio input, loudspeaker drivers, speaker enclosure, multiple power amplifiers and active, low level crossovers. All these are carefully aligned and housed within the loudspeaker cabinet.

Featuring a 96 kHz/24-bit digital audio interface and a proprietary ribbon tweeter capable of reproducing up to 50 kHz acoustic output, the S30D is a no compromise design. The fast, low distortion amplifiers are capable of driving a stereo system to peak output levels in excess of 122 dB SPL at 1 m with program signals. Versatile crossover controls allow for precise matching of the speaker system to different acoustic conditions. Designed for relatively small control rooms and available in vertical and horizontal versions, this system is ideal for multichannel digital workstations, mastering work, general purpose broadcasting and television studios, post production facilities and mobile recording vehicles. The high output and absolute reproduction accuracy make the S30D an ultimate nearfield monitor in recording studios.

DIGITAL AUDIO

The quality of a digital audio signal is defined by two parameters: word length and sampling rate.

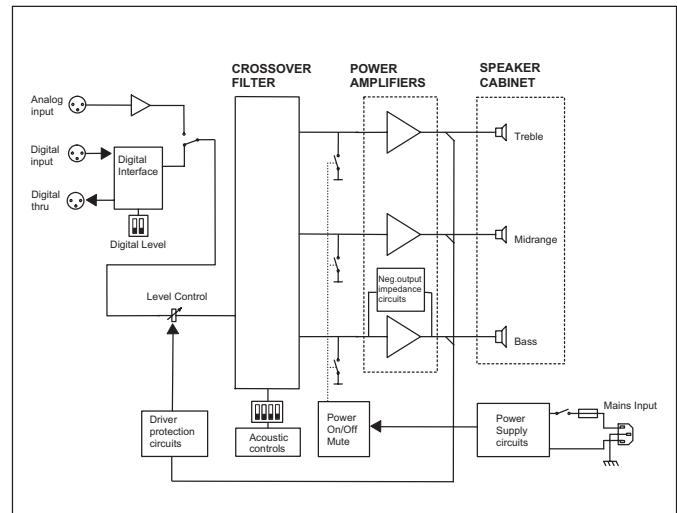
The word length defines how precisely the audio signal is represented. Studio recording systems use word lengths of 20 bits and above, typically 24 bits. The sampling rate determines what frequencies can be represented in the digital audio signal. A higher sampling rate allows higher frequencies to be recorded.

Converting the digital presentation to an analog signal involves potential sources of error. The digital-to-analog converter may have inferior performance. It may be misaligned with the amplifiers. The interface between the converter and the amplifier may distort the signal or it may change the frequency balance. Genelec S30D solves all of these problems. The alignment of the whole system is carefully balanced to ensure precise monitoring of the digital signal.

INTEGRATED CONSTRUCTION

As the digital interface and amplifiers are built into the speaker enclosure, the only connections required are the mains supply and the digital (or analog) input signal, making the S30D very easy to set up and use.

The rugged amplifier is mounted into the enclosure with vibration isolators which act also as quick release hinges making possible maintenance operations very easy and straightforward. The



The block diagram showing the digital interface, active crossover filters, power amplifiers and driver units.

speaker cabinet is constructed of veneered MDF, which is heavily braced to eliminate structural resonances.

DIGITAL INTERFACE

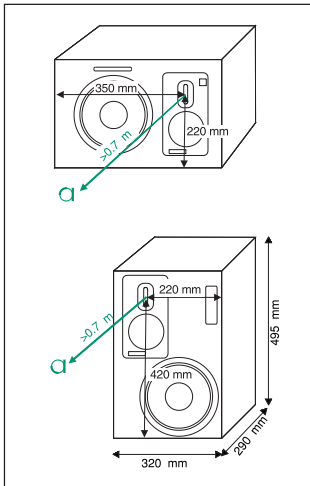
The digital audio interface consists of a digital audio receiver and a digital-to-analog converter (D/A converter). The digital input accepts an AES/EBU digital audio signal having a word length up to 24 bits. With an impedance adapter, the S30D can also accept SP-DIF signal. Digital thru allows the digital audio signal to be re-transmitted to other S30D loudspeakers and digital audio equipment.

AMPLIFIERS

The bass, midrange and treble amplifiers each produce 120 W of short term power with very low THD and IM distortion. Special attention is paid to electronics design to obtain the best possible subjective sound quality. The output impedance of the woofer amplifier is negative to improve acoustic transient response. Drivers and amplifiers are also protected for thermal overload.

DRIVERS

The 210 mm (8") woofer is loaded with a 24 liters (0.85 cu.ft.) vented



The reference axis is located on the tweeter driver.

cabinet. The woofer has a very large magnet and a long linear excursion capability. These are needed to reproduce low frequencies with efficiency and high acoustic output (SPL) in a small enclosure. The -3dB point is 35 Hz and the low frequency response extends down to 31 Hz.

A carefully designed 80 mm cone driver, sealed in a cast aluminum alloy housing, reproduces the critical midrange frequencies where the ear is the most sensitive. To minimize coloration the diaphragm is specially impregnated. As a result, the midrange driver's response actually extends well beyond the range required by the crossovers.



The unique ribbon tweeter and the sealed midrange driver are mounted on a separate chassis to match the dispersion characteristics.



Horizontal version S30D H



Vertical version S30D V

The high frequency driver is a proprietary ribbon tweeter with a moving mass of only 32 mg and frequency response extending up to 50 kHz. The dispersion characteristics of both the tweeter and midrange driver are matched for stable tonal balance in different rooms.

CROSSOVER FILTERS

The crossover frequencies of the active crossover network are 420 Hz and 4 kHz. Special calibrated

controls are included in the crossover to reach uniform frequency balance in different acoustic conditions. The Bass, Mid and Treble level controls operate in 1 dB steps. The Bass Tilt and Roll-off controls have 2 dB steps to allow refined LF response tailoring. A high pass filter is included in the LF channel to protect the woofer from subsonic signals. Variable level control allows for accurate level matching to the digital or analog signals.

DIGITAL AND ANALOG SIGNAL MANAGEMENT

The AES-EBU digital signal is fed into the "DIGITAL INPUT" XLR connector and carried on to another S30D via the "DIGITAL THRU" connector. Practically any number of S30D's can be daisy-chained in this manner.

When the S30D detects a digital signal it switches automatically to the digital input. The S30D will switch back to the analog input if significant errors are detected in the digital audio or the digital signal is not present.

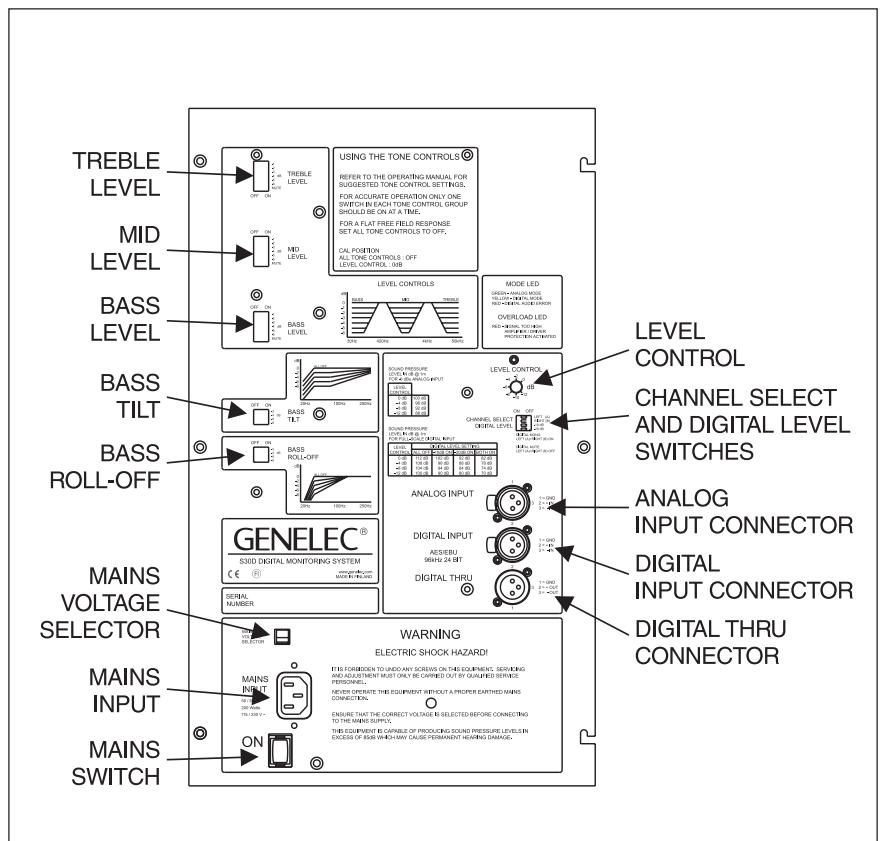
Loudspeaker mode is selected with "CHANNEL SELECT" switches on the speaker back-

plate. A speaker can be designated as "Left (A)", "Right (B)" or "Left+Right (A+B)" channel.

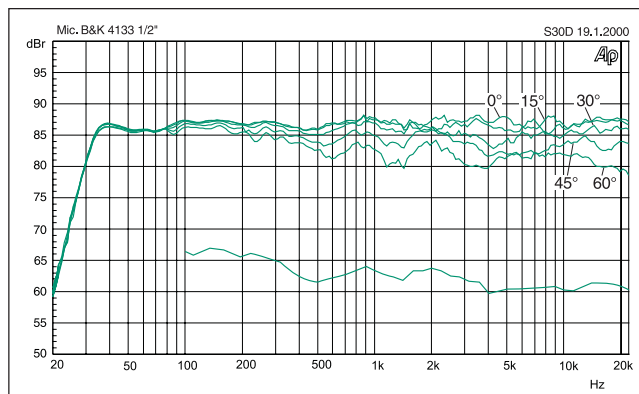
The maximum SPL at 1m for a full scale digital signal can be adjusted using the "DIGITAL LEVEL" switches. This compensates for differing amounts of headroom on the digital signal and enables the speaker to work at its maximum SPL if required. The "DIGITAL LEVEL" can be set to 112, 102 or 92 dB SPL at 1m with a full scale digital signal.

The "LEVEL CONTROL" trimmer adjusts the level of both the digital and analog signals. Using this trimmer the digital level can be adjusted to give an extra 0 to -12 dB attenuation in addition to the "DIGITAL LEVEL" switches. This makes it possible to adjust the maximum SPL at 1m for a full scale digital signal anywhere between 112 dB and 70 dB.

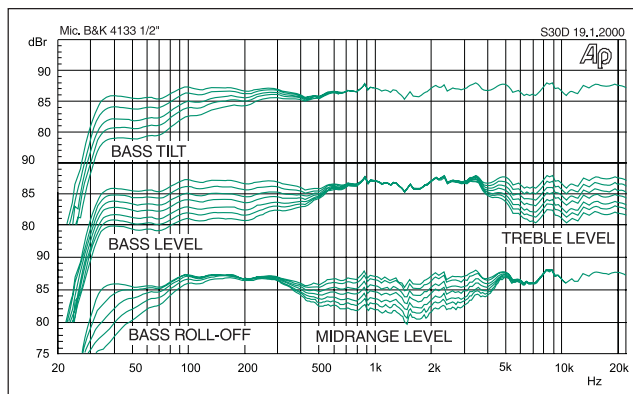
The "ANALOG INPUT" XLR connector allows monitoring of analog audio signal.



S30D backplate, connectors and controls



The upper curve group shows the horizontal directivity characteristics of S30D in its vertical configuration measured at 1 m. The lower curve shows the systems power response.



The curves above left show the effect of the 'bass tilt', 'bass level' and 'bass roll-off' controls on the free field response. The curves to the right show the effect of the treble and midrange 'level' controls.

SYSTEM SPECIFICATIONS

Lower cut-off frequency, -3 dB: ≤ 35 Hz
 Upper cut-off frequency, -3 dB: ≥ 50 kHz

Free field frequency response of system:
 36 Hz - 48 kHz (± 2.5 dB)

Maximum short term sine wave acoustic output on axis in half space, averaged from 100 Hz to 3 kHz:
 @1m ≥ 111 dB SPL
 @0.5m ≥ 117 dB SPL

Maximum long term RMS acoustic output in same conditions with IEC-weighted noise (limited by driver unit protection circuit):
 @1m ≥ 102 dB SPL
 @0.5m ≥ 108 dB SPL

Maximum peak acoustic output per pair on top of console, @ 1m from the engineer with music material:
 ≥ 122 dB

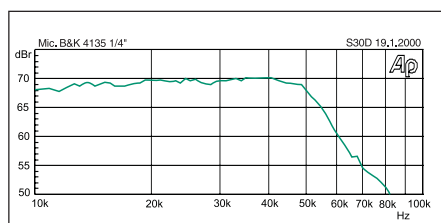
Self generated noise level in free field @ 1m on axis:
 ≤ 10 dB (A-weighted)

Harmonic distortion at 90 dB SPL at 1m on axis:
 freq. ≤ 200 Hz $< 2\%$
 freq. > 200 Hz $< 1\%$

Drivers:
 Bass 210 mm cone
 Midrange 80 mm cone
 Treble 9x65 mm ribbon

Weight: 20 kg (44 lb)

Dimensions:
 Height 495 mm ($19\frac{1}{2}$ ")
 Width 320 mm ($12\frac{5}{8}$ ")
 Depth 290 mm ($11\frac{7}{16}$ ")



The curve above shows the on-axis free field response of the S30D between 10 and 100 kHz.

CROSSOVER SECTION

Analog input connector: XLR female
 pin1 gnd
 pin2 +
 pin3 -

Input impedance: 10 kOhm

Input level for maximum short term output of 111 dB SPL @1m:
 variable from +17 to +5 dBu

Output level for -6 dBu analog input:
 variable from 88 to 100 dB SPL @1m

Subsonic filter below 33 Hz: 18 dB/octave

Ultrasonic filter above 60kHz: 12dB/octave

Crossover frequency:
 bass/mid 420 Hz
 mid/treble 4 kHz

Crossover acoustical slopes:
 18 - 24 dB/octave

Crossover level control operating range in 1 dB steps:
 bass from 0 to -6 dB
 mid from 0 to -6 dB
 treble from 0 to -6 dB

Bass roll-off control in 2 dB steps:
 from 0 to -8 dB @42 Hz

Bass tilt control in 2 dB steps:
 from 0 to -8 dB @80 Hz

The 'CAL' position is with all tone controls set to 'off' and input sensitivity control to maximum.

OPTIONS

Flight case Order Code 1001-401
 Wall mount Order Code 1010-404-V/H*
 Floor stand Order Code 1010-405-V/H*
 Handles Order Code 1001-406
 Grille Order Code 1010-409

*V=Vertical (for S30D V), H=Horizontal (for S30D H)

DIGITAL SECTION

Digital input: XLR female
 Digital thru output: XLR male

Maximum input word length: 24 bits
 Input format: AES/EBU, SP-DIF*
 Input termination impedance: 110 Ohms

Input sampling rate: 29-100 kHz (no de-emphasis)
 44.1 kHz (using de-emphasis)
 Jitter resilience: 0.15 unit intervals

Dynamic range: 120dB (A weighted, triangular PDF dither, 24 bit data)

De-emphasis: 50/15us, automatic

Recovered clock jitter: 200 picoseconds RMS typical

Output level for full scale digital input:
 variable from 76 to 112 dB SPL @1m

* An optional impedance matching adapter (ie. Neutrik BXM) is required for SP-DIF formatted signal input.

AMPLIFIER SECTION

Amplifier output power with an 8 Ohm load (Short term):
 Bass 120W
 Midrange 120W
 Treble 120W

Long term output power is limited by driver unit protection circuitry.

Slew rate: 80V/ μ s

Amplifier system distortion at nominal output:
 THD $\leq 0.05\%$
 SMPTE-IM $\leq 0.05\%$
 CCIF-IM $\leq 0.05\%$
 DIM 100 $\leq 0.05\%$

Signal to Noise ratio, referred to full output:
 Bass ≥ 100 dB
 Midrange ≥ 100 dB
 Treble ≥ 100 dB

Mains voltage: 100/200V or 115/230V

Voltage operating range at 230V setting: $\pm 10\%$

Power consumption: Idle 30W
 Full output 200W

All data subject to change without prior notice.