GENELEC®

ACTIVE MONITORING

2029B

DATA SHEET

Genelec 2029B
Digital Monitoring System

2029B Digital Monitoring System

MAIN FEATURES:

AES/EBU digital audio and analog audio inputs in a single speaker system

96 kHz / 24-bit digital audio interface

Automatic detection of word length and sampling rate

Perfect level match throughout the system from D/A converter to power amplifier outputs

Control of stereo pair sensitivity with a single knob

Control of stereo pair balance with a single knob

Support for 1091A subwoofer

High system integration

GENERAL DESCRIPTION

Genelec 2029B Digital Monitoring System has a 96 kHz/24 bit digital audio interface. This has several significant advantages. When you are working with a digital audio workstation or you are processing audio in a modern studio, your signal is digital. The 2029B allows you to monitor what you have in your digital format. The 2029B supports all the same modes of operation as the analog Genelec 1029A. You can use it with a subwoofer. You can use it in surround audio systems.

Due to its compact size, integrated construction, excellent dispersion and precise stereo imaging, the 2029B system is ideal for near field monitoring, mobile vans, digital audio workstations, broadcast and TV control rooms, surround sound systems, home studios, multimedia applications and also for use with computer soundcards. The Directivity Control Waveguide (DCW™) technology provides excellent frequency balance even in difficult acoustic environments.

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. Longer word length leads to smaller noise and distortion level. The typical word length in CD records is 16 bits. Studio recording systems use word lengths of 20 bits and above.

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 using a D/A converter involves potential sources of error. Your digital-to-analog converter may have inferior performance, or it may be misaligned with your amplifiers. The interface between the converter and the amplifier may distort the signal or change the frequency balance. The monitoring volume level may need to be adjusted in the digital domain instead of analog. Genelec 2029B allows you to solve all of these problems. The alignment of the whole system from the digital input connector is carefully balanced, to make sure that you hear the whole digital truth, and nothing but the truth. All you have to do is to supply the digital signal, and adjust for the volume you desire.

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 2029B very easy to set up and use.

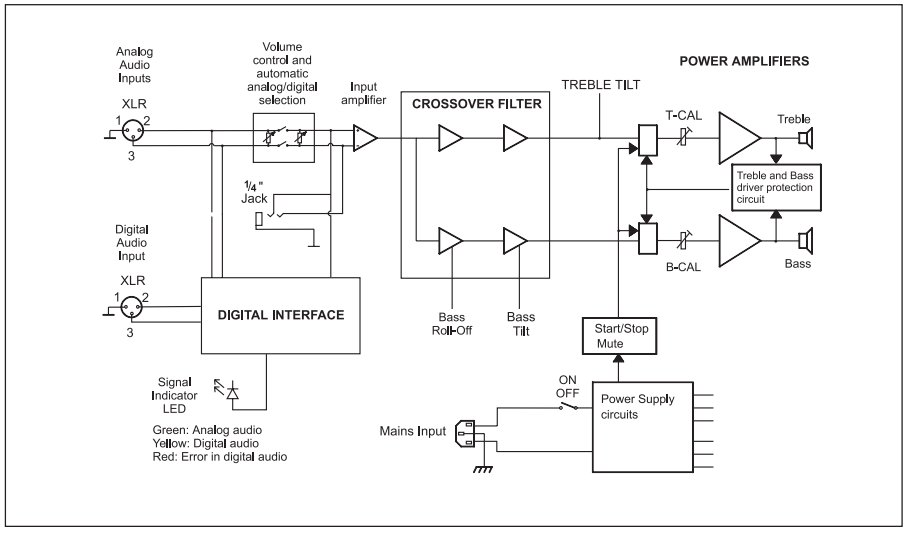

Figure 1: 2029B Digital block diagram showing D/A converter, active crossover filters, power amplifiers and driver units

DIGITAL INTERFACE

The digital audio input comprises 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 and up to 100 kHz sampling rate. The D/A converter has high resilience to clock jitter and has excellent linearity.

DRIVERS

The bass frequencies are reproduced by a 130 mm (5") bass driver mounted in a 4.5 litre vented cabinet. The -3 dB point lies at 68 Hz and the frequency response extends down to 65 Hz (-6 dB).

The high frequency driver is a 19 mm (3/4") metal dome. Uniform dispersion control is achieved with the revolutionary DCW™ Technology pioneered by Genelec.

Magnetic shielding is standard on Genelec 2029B. Shielding is vital for applications such as video post production, where stray magnetic fields must be minimized.

CROSSOVER

The active crossover network is acoustically complementary and the slopes are 24 - 32 dB/octave. The crossover frequency is 3.3 kHz. The room response controls ('treble tilt', 'bass tilt' and 'bass roll-off') allow exact match to any installation.

AMPLIFIERS

The amplifier unit is built inside the speaker enclosure. The bass and treble amplifiers both produce 40 W of output power. The fast, low distortion amplifiers are capable of driving a stereo pair to peak output sound pressure levels in excess of 110 dB at 1 m. The unit incorporates special circuitry for driver overload protection.

DIGITAL AND ANALOG SIGNAL MANAGEMENT

The digital interface is housed in the speaker marked as "RIGHT SPEAKER". The balanced AES/EBU digital signal is fed into this unit via a XLR connector. In digital mode the speakers are connected to each other with a balanced cable, which carries the converted analog signal to the "Left" speaker. In digital mode the output level for both speakers is controlled with the potentiometer on the "Right" unit. The balance is adjusted with the potentiometer on the "Left" unit.

In analog mode both speakers are connected individually to the signal source with balanced audio cables. In this mode the output level is adjusted separately on each 2029B unit.

TONE CONTROLS

The response of the system usually has to be adjusted to match the acoustic environment. The adjustment is done by setting the tone control switches on the rear panel. The tone control has four switches and can adjust 'treble tilt', 'bass tilt' and 'bass roll-off.' The factory settings for these are 'ALL OFF' to give a flat anechoic response. Figure 5 overleaf shows the effect of the controls on the anechoic response.

MOUNTING OPTIONS

There are several possibilities for mounting the 2029B Digital. On the base of the monitor is a $^{3}/_{8}$" UNC threaded hole which can accommodate a standard microphone stand. There is a provision for an Omnimount® size 50 bracket,for which two M6x10mm screws are required. Alternatively the speaker can be hung on M4 screws with suitable heads by one of the three keyhole slots on the backpanel. The speaker can be hung in a horizontal or vertical position. Friction pads are provided for placement on a shelf or a stand.

OPTIONS

Order code	Description
1029-404	Wall Mount
1029-405	Ceiling Mount
1029-420	Soft carrying bag

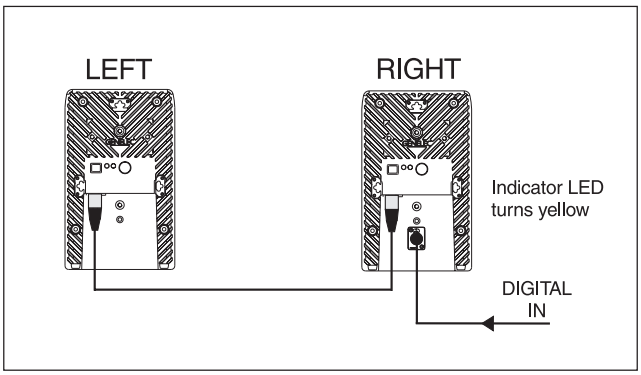

Figure 3: Connecting a pair of 2029B Digitals to a digital input signal

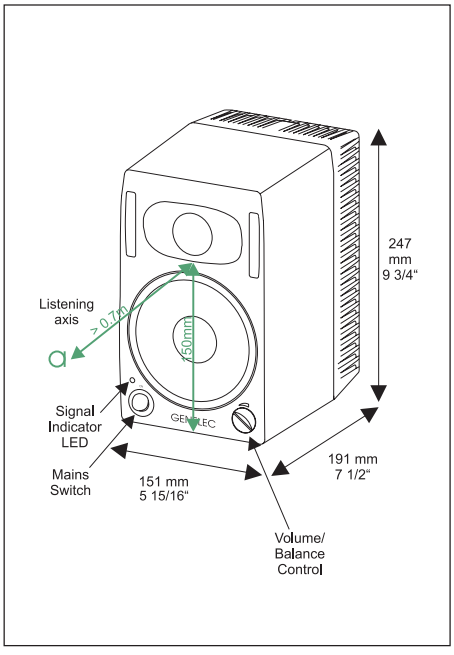

Figure 2: 2029B Digital outer dimensions, with the reference axis between the bass and the treble drivers.

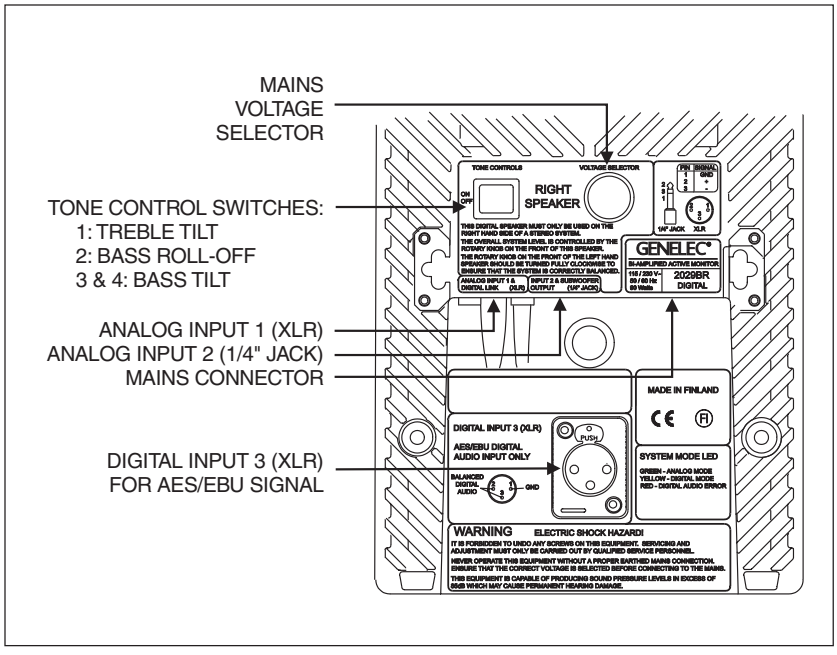

Figure 4: 2029B Digital "Right" speaker backpanel

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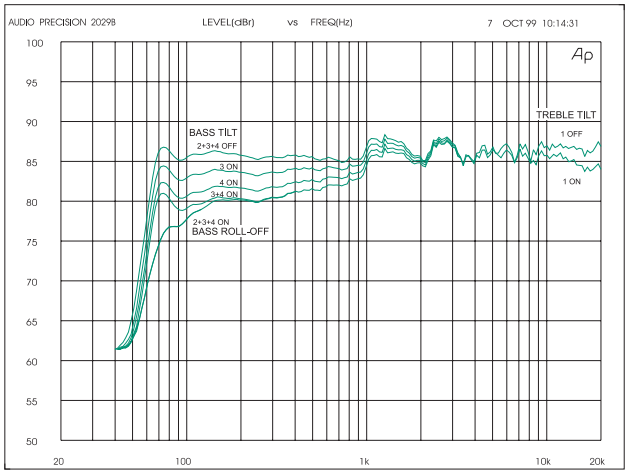

Figure 5: The curve above shows the effect of the 'treble tilt', 'bass tilt' and 'bass roll-off' controls on the free field response.

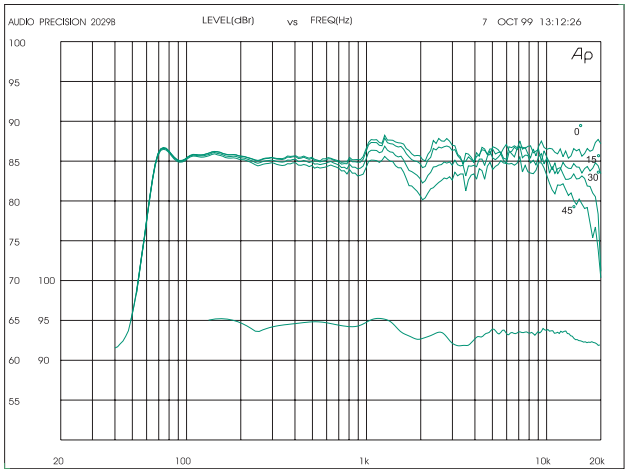

Figure 6: The curve group shows the horizontal directivity characteristics of 2029B Digital in its vertical configuration measured at 1m. The lower curve shows the systems power response.

SYSTEM SPECIFICATIONS

Lower cut-off frequency, -3 dB: ≤ 68 Hz

Upper cut-off frequency, -3 dB: ≥ 20 kHz

Free field frequency response of system: 70 Hz - 18 kHz (± 2.5 dB)

Maximum short term sine wave acoustic output on axis in half space, averaged from 100 Hz to 3 kHz:
@ 1m ≥ 100 dB SPL
@ 0.5m ≥ 106 dB SPL

Maximum long term RMS acoustic output in same conditions with IEC weighted noise (limited by driver unit protection circuit):
@ 1m ≥ 98 dB SPL
@ 0.5m ≥ 104 dB SPL

Maximum peak acoustic output per pair on top of console,
@ 1 m from the engineer with music material:
≥ 110 dB

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

Harmonic distortion at 85 dB SPL @ 1m on axis:

Freq:		
	75...150 Hz	< 3%
	> 150 Hz	< 1%

Drivers:
Bass 130 mm (5") cone
Treble 19 mm ($^3/_4$") metal dome
Both drivers are magnetically shielded

Weight: 5.7 kg (12.5 lb)

Dimensions:

Height	247 mm	(9 $^3/_4$")
Width	151 mm	($5^{15}/_{16}$")
Depth	191 mm	(7 $^1/_2$")

CROSSOVER SECTION

Analog inputs:
Input 1: XLR female, balanced 10kOhm
Input 2: $^1/_4$" Jack socket, balanced 10kOhm

Volume control:
Variable from Mute to -6 dBu for 100 dB SPL output @ 1m

Subsonic filter below 68 Hz :
18 dB/octave

1091A Subwoofer output (input 2) at 100db SPL:
-23 dBu into 33kOhm load

Ultrasonic filter above 25 kHz: 12 dB/octave

Crossover frequency, Bass/Treble: 3.3 kHz

Crossover acoustical slopes: 24 - 32 dB/ octave

Treble tilt control operating range: 0 to -2 dB @ 15 kHz

Bass roll-off control operating in a -6 dB step @ 85 Hz (to be used in conjunction with the 1091A subwoofer)

Bass tilt control operating range in -2 dB steps:
0 to -6 dB @ 150 Hz

The 'CAL' position is with all tone controls set to 'off' and the input sensitivity control to maximum (fully clockwise).

DIGITAL SECTION

Digital input 3: XLR female
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 resiliance: 0.15 unit intervals

Dynamic range: 113dB (A weighted, triangular PDF dither, 24 bit data)

De-emphasis: 50/15us, automatic

Recovered clock jitter: 200 picoseconds RMS typical

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

AMPLIFIER SECTION

Bass amplifier output power with an 8 Ohm load: 40 W

Treble amplifier output power with an 8 Ohm load: 40 W

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

Amplifier system distortion at nominal output:

THD	≤ 0.08%
SMPTE-IM	≤ 0.08%
CCIF-IM	≤ 0.08%
DIM 100	≤ 0.08%

Signal to Noise ratio, referred to full output:

Bass	≥ 90 dB
Treble	≥ 90 dB

Mains voltage: 100/200 or 115/230 V

Voltage operating range: ±10%

Power consumption:

Idle	9 VA
Full output	80 VA

All data subject to change without prior notice

Genelec Oy, Olvitie 5
FIN - 74100 IISALMI, FINLAND
Phone: +358 - 17 - 83 881
Fax: +358 - 17 - 812 267
E-mail: genelec@genelec.com
Web: http://www.genelec.com

GENELEC®

Genelec Inc, 7 Tech Circle
Natick, MA 01760, USA
Phone: +1 - 508 - 652 - 0900
Fax: +1 - 508 - 652 - 0909
E-mail: genelec.usa@genelec.com