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Genelec 2029A Digital Monitoring Speaker

Data sheet



2029A Digital Monitoring Speaker





Main features:

S/P-DIF digital audio and analog audio inputs in a single speaker system

Automatic detection of word length and sampling rate

Perfect level match throughout the system from DA 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 2029A Digital near field monitor has a 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 2029A Digital allows you to monitor what you have in your digital format.

The 2029A Digital supports all the same modes of operation as the analog 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, this speaker 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. Turning the digital presentation to an analog signal using a DA converter involves significant sources of error. Your digital-toanalog converter may have inferior performance. It may be misaligned with your amplifiers. The interface between the converter and the amplifier may distort the signal or it may change the frequency balance. Your monitoring volume level may need to be adjusted in the digital domain instead of analog. Genelec 2029A Digital 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



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

mains supply and the digital input signal, making the 2029A Digital very easy to set up and use.

DIGITAL INTERFACE

The digital audio input comprises of a digital audio receiver and a digital-to-analog converter (DA converter). The digital input accepts an S/P-DIF digital audio signal having a word length up to 24 bits. The DA converter has an interpolator increasing the internal sampling rate to four times the original before a fourth order delta-sigma modulator, and a digital-to-analog conversion in a switched capacitor integrator and an analog low-pass filter. This conversion process 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 2029A Digital. 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.

HOW TO SET UP FOR DIGITAL SIGNALS

Special interconnect cable connects between the XLR connectors of the two 2029A Digital monitors.

The IEC958 interface cable from your digital audio source connects to one of the 2029A Digital units.

In the digital audio reproduction mode the output level for both speakers pair is controlled with the right unit. The balance is automatically calibrated correctly with the proposed output level setting on the left unit.

HOW TO SET UP FOR ANALOG SIGNALS

Run normal XLR cables from your analog audio source to the XLR connectors on both 2029A Digital units.

Adjust the output levels at the front of both 2029A Digital units.

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 6 overleaf shows the effect of the controls on the anechoic response. Always start adjustment by setting all switches to 'OFF' position. Then set the switch if needed to the 'ON' position to select the response curve needed.

MOUNTING OPTIONS

There are several possibilities for mounting the 2029A Digital. On the base of the monitor is a 3/g 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 2029A Digitals to a digital input signal



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



Figure 4: 2029A 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.

SYSTEM SPECIFICATIONS

Lower cut-off frequency, -3 dB:			<u>≤</u> 68 Hz	
Upper cut-off frequency, -3 dB:			\geq 20 kHz	
Free field frequency response of system:70 Hz $(\pm~2.5$				
Maximum sho in half space,	rt term sine averaged fr	wave acoustic com100 Hz to 3 @ 1m @ 0.5m	output on axis kHz: ≥ 100 dB SPL ≥ 106 dB SPL	
Maximum long term RMS acousticoutput in same conditions with IECweighted noise (limited by driver unit protection circuit):				
	Sury:	@ 1m @ 0.5m	\geq 98 dB SPL \geq 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 infree field @ 1m on axis: $ \leq 10 \text{ dB} \\ (\text{A-weighted}) $				
Harmonic dist	ortion at 85 Freq:	dB SPL @ 1m (75150 Hz > 150 Hz	on axis: < 3% < 1%	
Drivers:	Bass Treble	130 mm (5") o 19 mm (3/4") n	cone netal dome	
Weight:		5.7 Kg	(12.5 lb)	
Dimensions:	Height Width Depth	247 mm 151 mm 191 mm	(9 ³ / ₄ ") (6") (7 ¹ / ₂ ")	

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CROSSOVER SECTION

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: 3.3kHz

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).





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

DIGITAL SECTION

Input word length:	24 bits	
Input format:	IEC958, S/P-DIF, EIJAC CP-340	
Input termination impeda	nce: 75 ohms	
Input sampling rate:	25-55 kHz (no de-emphasis) 44.1 and 48 kHz (using de-emphasis)	
Jitter resiliance:	0.15 unit intervals	
Dynamic range:	101 dB (A weight, triangular PDF dither, 20 bit data)	
De-emphasis:	50/15us, automatic	
Recovered clock jitter:	200 picoseconds RMS typical	

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 SMPTE-IM CCIF-IM DIM 100	$\leq 0.08\%$ $\leq 0.08\%$ $\leq 0.08\%$ $\leq 0.08\%$
Signal to Noise ratio,	referred to full output: Bass Treble	\geq 90 dB \geq 90 dB
Mains voltage:	100/200 or 115/230 V	
Voltageoperatingram	nge:	±10%
Power consumption:	Idle Full output	9 VA 80 VA

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