



Velodyne[®]

Digital Drive Series



Introducing The New Digital Drive™ Series Subwoofers

Since the introduction of the first High Gain Servo system in 1983, Velodyne's servo-controlled subwoofers have defined—and redefined—the reference in low-frequency performance. Twenty years after Velodyne's introduction of the world's first low-distortion, high definition subwoofer, Velodyne now introduces a new revolution in subwoofer design—the first microprocessor-controlled all-digital subwoofer.

The Digital Drive™ Series consists of four totally new digital subwoofers—the DD-10 (10" driver, 8" piston diameter), the DD-12 (12" driver, 9.7" piston diameter), the DD-15 (15" driver, 12.7" piston diameter), and the DD-18 (massive 18" driver, 15.2" piston diameter). Built to be as small as physically possible, they still deliver musical accuracy and visceral, ultra-low bass that you actually feel. Digital Drive™ subwoofers raise the standards by which subwoofers are measured to a new high.

Concepts and Goals

The first major challenge to accurate subwoofer performance is overcoming shockingly high levels of distortion that make most subwoofers muddy, boomy, and lacking in definition and clarity, especially at higher playback levels. Velodyne's patented accelerometer-based High Gain Servo (HGS) technology, used initially in the ULD Series and later in the HGS Series subwoofers, lowers distortion at all frequencies and playback levels to less than 1%. This technology established Velodyne subwoofers as the benchmark by which all others have been measured over the past 20 years.

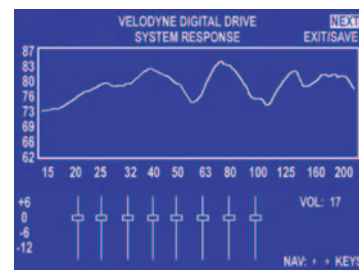
Another often overlooked factor that dramatically affects a subwoofer's performance is how the room's shape, size, and appointments impact the reproduction of the audio spectrum. The room always creates anomalies in the subwoofer's frequency response, and can wreak havoc in the interaction between the subwoofer and the main speakers. Unfortunately, this phenomenon is little understood and worse, requires

extensive additional technology and training to understand and correct. For the first time, Velodyne's Digital Drive™ Series subwoofers can display these room anomalies visually and provide the tools to correct them, allowing you to optimize the sub's performance regardless of its position, where in the room you listen, and the room's shape and size.

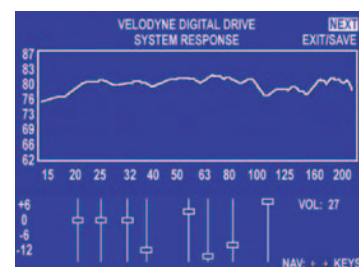
Room Management Technology: Digital Drive™

Digital Drive™ Series subwoofers feature Velodyne's new, revolutionary Digital Drive™ room management technology. This latest Velodyne innovation allows the subwoofer's frequency response to be measured using a calibrated microphone and viewed graphically on any standard TV. The on-board 8-band digital graphic/parametric equalizer can be used to optimize the subwoofer's performance for any position in any room. Additionally Digital Drive™ subwoofers also offer complete control over crossovers (both subsonic and low pass), slopes, phase, and polarity, which allows perfect matching of the subwoofer to any speakers in any environment. All Digital Drive™ subwoofers come complete with a microphone, cables, and remote.

You've probably heard that room placement is an important factor in subwoofer performance. Digital Drive™ technology allows you to actually see the response for any sub location and listening position you may choose. And, if your room placement options are limited, you can be sure that the location that is chosen will be optimized for maximum performance.



Before



After

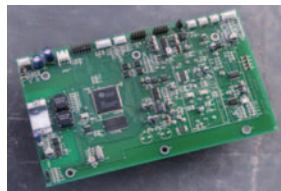
Digital Perfection

Presets: A Musical AND A Theatrical Subwoofer All In One
All Digital Drive™ subwoofers come preprogrammed with four listening mode “presets” for Action Adventure, Movies, Rock/Pop, and Jazz/Classical. There are also Custom, and EQ Defeat presets. Each preset can be totally customized for crossovers and phase, feature an “extra” equalizer, and can have their volume set differentially from the system volume. Each preset also has a “theater/music” setting that allows the sub to play louder (e.g. for movies) or tighter (e.g. for music) depending on the source content. No more compromise between a “musical” sub and a “theatrical” sub! The theater/music selection by preset is another of the many firsts in the Digital Drive™ Series.



Microprocessor Controlled

Digital Drive™ subwoofers are controlled by a computer chip from Texas Instruments®. All video and audio processing is controlled by this chip. The unit can be commanded via RS-232 port by universal remotes such as from Crestron – another Digital Drive™ first. Multiple Digital Drive™ units can be daisy chained together and controlled from one source. The software for Digital Drive™ subwoofers can be updated from Velodyne’s web site, so you will always have access to new features incorporated into later designs.



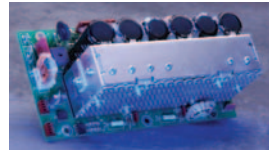
Cone Control Technology: Digital High Gain Servo™ System

Velodyne engineers further increased the accuracy and lowered the distortion of the Digital Drive™ Series by including the latest generation of Velodyne’s patented High Gain Servo™ system. This technology uses a proprietary, sealed, digital accelerometer to measure, compare and control cone movements 16,000 times a second (up from the 3,500 times per second featured in the HGS Series) in order to correct for any distortion. This provides the highest definition and lowest distortion available (as low as .5%). The result is the ultimate in subwoofer accuracy and impact.



Amplifier Technology: The Digital Energy Recovery Amplifier™

Conventional (Class A/B) amplifiers convert about 50% of the energy they draw into output, making them too inefficient to generate the tremendous power needed for a truly high performance subwoofer. Velodyne’s patented Energy Recovery Amplifier™, a transformer-less Class-D Digital design, is the most efficient audio amplifier ever built. At better than 95% efficiency, it is limited only by the power it can draw from a wall outlet! Using 1250 watt RMS (over 3,000 watts of Dynamic power) Energy Recovery Amplifiers™, Digital Drive™ subwoofers incorporate more usable power than any subwoofer in history except Velodyne’s own Signature 1812.™



Driver Technology: Dual Tandem Voice Coil and Kevlar-Reinforced Cones

The drivers used in the Digital Drive™ Series provide extremely high power handling with less than half the distortion of conventional designs. These innovations center on the driver’s revolutionary Dual Tandem Voice Coil, which is 3” in diameter and over 6” in length, ensuring over 1-1/4” of excursion. The huge magnet structure and 2-layer aluminum clad copper wire provides high power handling capacity and linear motion. In addition, all DD drivers feature incredibly light, stiff, low resonance Kevlar-reinforced cones, custom designed variable thickness EPDM surrounds and custom die-cast aluminum baskets.



Cabinet Design

These massive drivers and the corresponding electronics are housed in a new state-of-the-art, computer-designed cabinet. Striking to look at in real maple or cherry veneers, or in lustrous black lacquer, the cabinet has been engineered to eliminate resonance and create stability. Finally, a set of milled aluminum, acoustically-isolated feet are included on the DD-15 and DD-18, while a set of rubber isolating inverted cone feet are included on the DD-10 and DD-12.



Specifications	DD-10	DD-12	DD-15	DD-18
Cabinet (H/W/D) (inc. feet)	11.75" x 11.75" x 13.5"	14.5" x 14" x 15.5"	20" x 18" x 17.75"	23" x 21.25" x 19.25"
Frequency Response	18 Hz to 120 Hz +/-3 dB	17 Hz to 120 Hz +/-3 dB	15 Hz to 120 Hz +/-3 dB	14 Hz to 120 Hz +/-3 dB
Harmonic Distortion	<1% (typical)	<1% (typical)	Less than 0.5% (typical)	Less than 0.5% (typical)
High Pass Crossover	80 Hz at 6 dB/octave	80 Hz at 6 dB/octave	80 Hz at 6 dB/octave	80 Hz at 6 dB/octave
Low Pass Crossover	15 Hz to 199 Hz (variable (in 1 Hz increments) 6/12/18/24/30/36/42/48 dB per octave slope (variable) Default: 80 Hz @ 24 dB/ octave	15 Hz to 199 Hz (variable (in 1 Hz increments) 6/12/18/24/30/36/42/48 dB per octave slope (variable) Default: 80 Hz @ 24 dB/ octave	15 Hz to 199 Hz (variable (in 1 Hz increments) 6/12/18/24/30/36/42/48 dB per octave slope (variable) Default: 80 Hz @ 24 dB/ octave	15 Hz to 199 Hz (variable (in 1 Hz increments) 6/12/18/24/30/36/42/48 dB per octave slope (variable) Default: 80 Hz @ 24dB/ octave
Subsonic Filter	15 Hz to 35 Hz (variable in 1 Hz increments) 6/12/18/24/30/36/42/48 dB per octave slope (variable) Default: 15 Hz @ 24 dB/ octave	15 Hz to 35 Hz (variable in 1 Hz increments) 6/12/18/24/30/36/42/48 dB per octave slope (variable) Default: 15 Hz @ 24 dB/ octave	15 Hz to 35 Hz (variable in 1 Hz increments) 6/12/18/24/30/36/42/48 dB per octave slope (variable) Default: 15 Hz @ 24 dB/ octave	15 Hz to 35 Hz (variable in 1 Hz increments) 6/12/18/24/30/36/42/48 dB per octave slope (variable) Default: 15 Hz @ 24 dB/ octave
Phase	0 to 180 degrees (variable in 15 degree increments)	0 to 180 degrees (variable in 15 degree increments)	0 to 180 degrees (variable in 15 degree increments)	0 to 180 degrees (variable in 15 degree increments)
Polarity	Adjustable (+/-)	Adjustable (+/-)	Adjustable (+/-)	Adjustable (+/-)
Amplifier (Class D)	1250 watts RMS (3000 Peak)	1250 watts RMS (3000 Peak)	1250 watts RMS (3000 Peak)	1250 watts RMS (3000 Peak)
Woofers (Forward Firing)	10" (8" piston diameter)	12" (9.7" piston diameter)	15" (12.7" piston diameter)	18" (15.2" piston diameter)
Magnet Structure	310 ounces (19.3 lbs)	310 ounces (19.3 lbs)	380 ounces (24 lbs)	380 ounces (24 lbs)
Voice Coil	Tandem 3-inch push-pull	Tandem 3-inch push-pull	Tandem 3-inch push-pull	Tandem 3-inch push-pull
Inputs:				
LFE (Mono)	Line Level (RCA), Balanced (XLR)	Line Level (RCA), Balanced (XLR)	Line Level (RCA), Balanced (XLR)	Line Level (RCA), Balanced (XLR)
Input (L&R)	Line Level (RCA)	Line Level (RCA)	Line Level (RCA)	Line Level (RCA)
Microphone	Balanced (XLR, cable included)	Balanced (XLR, cable included)	Balanced (XLR, cable included)	Balanced (XLR, cable included)
Speaker Level (L&R)	Bare wire, banana plugs, or spade lugs	Bare wire, banana plugs, or spade lugs	Bare wire, banana plugs, or spade lugs	Bare wire, banana plugs, or spade lugs
Outputs:				
Thru (L&R)	Line Level (RCA)	Line Level (RCA)	Line Level (RCA)	Line Level (RCA)
Output (L&R)	Line Level (RCA)	Line Level (RCA)	Line Level (RCA)	Line Level (RCA)
EQ Output	Line level (RCA) for Test Signal L/R and Video (cables included)	Line level (RCA) for Test Signal L/R and Video (cables included)	Line level (RCA) for Test Signal L/R and Video (cables included)	Line level (RCA) for Test Signal L/R and Video (cables included)
Warranty	Two years	Two years	Two years	Two Years
Weight (approx.)	57 lbs.	67 lbs.	100 lbs.	120 lbs.

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