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Sennheiser EW-DX Digital UHF Wireless Microphone System

By: Mel Lambert

Time and tide, as they say, wait for no man. In the world of live-performance technologies, Sennheiser has carved out a creative niche by developing wireless microphones that provide user features we've have been asking for, sometimes before we know we need them. The new EW-DX digital UHF wireless microphone system is a perfect example of this process of creative innovation, which puts more affordable technology into the hands of live sound professionals while retaining audio quality, reliability, and end-user convenience.

Extending the familiar Evolution Wireless Digital system, which was reviewed by Mark Johnson in the December 2021 edition of *LSA*, this new offering ably demonstrates that the clever technologists at Sennheiser's German R&D Department have not been idle during the past couple of years. The new system adds a host of new features within that familiar packaging format, including enhanced switching bandwidth of up to 88MHz (compared to the EW-D's 56MHz); 600kHz channel spacing on an equidistant grid to offer a 146 RF channel count across the available spectrum space; up to 293 available channels with Link Density Mode's 300kHz spacing (compared to the EW-D's maximum of 90 available channels); AES256 data securing and encryption; Audinate Dante compatibility on two models with a choice of single-cable, split-cable, and redundancy modes; advanced remote operation and control using the company's Wireless Systems Manager or Control Cockpit; four-way power supplies plus



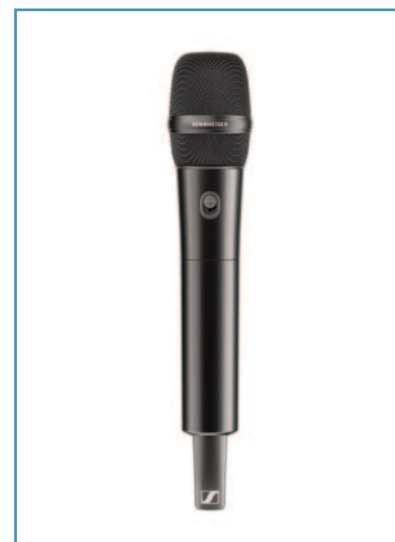
Front view of EW-DX EM 2 receiver.



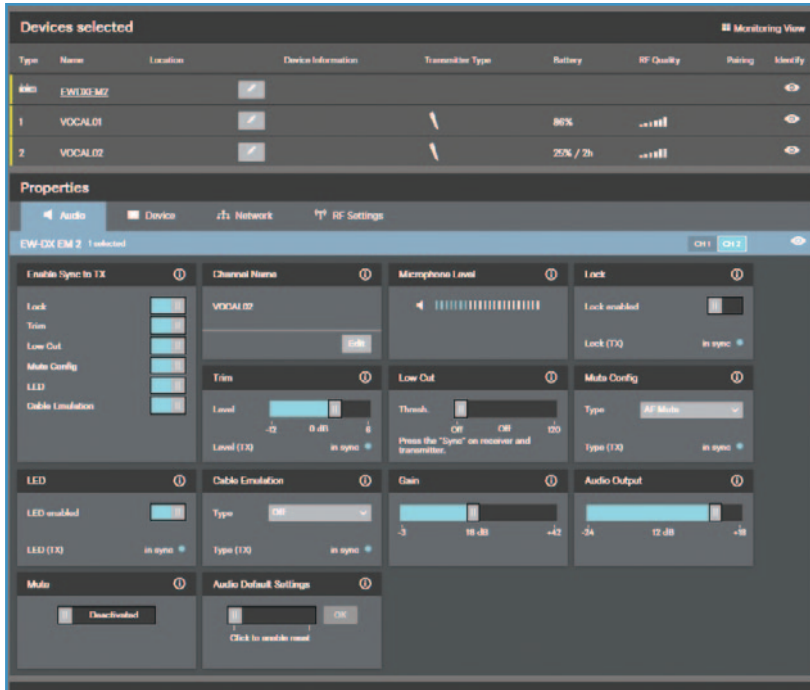
Rear view of the receiver.



EW-DX SK three-pin transmitter.



EW-DX SKM-S handheld transmitter.

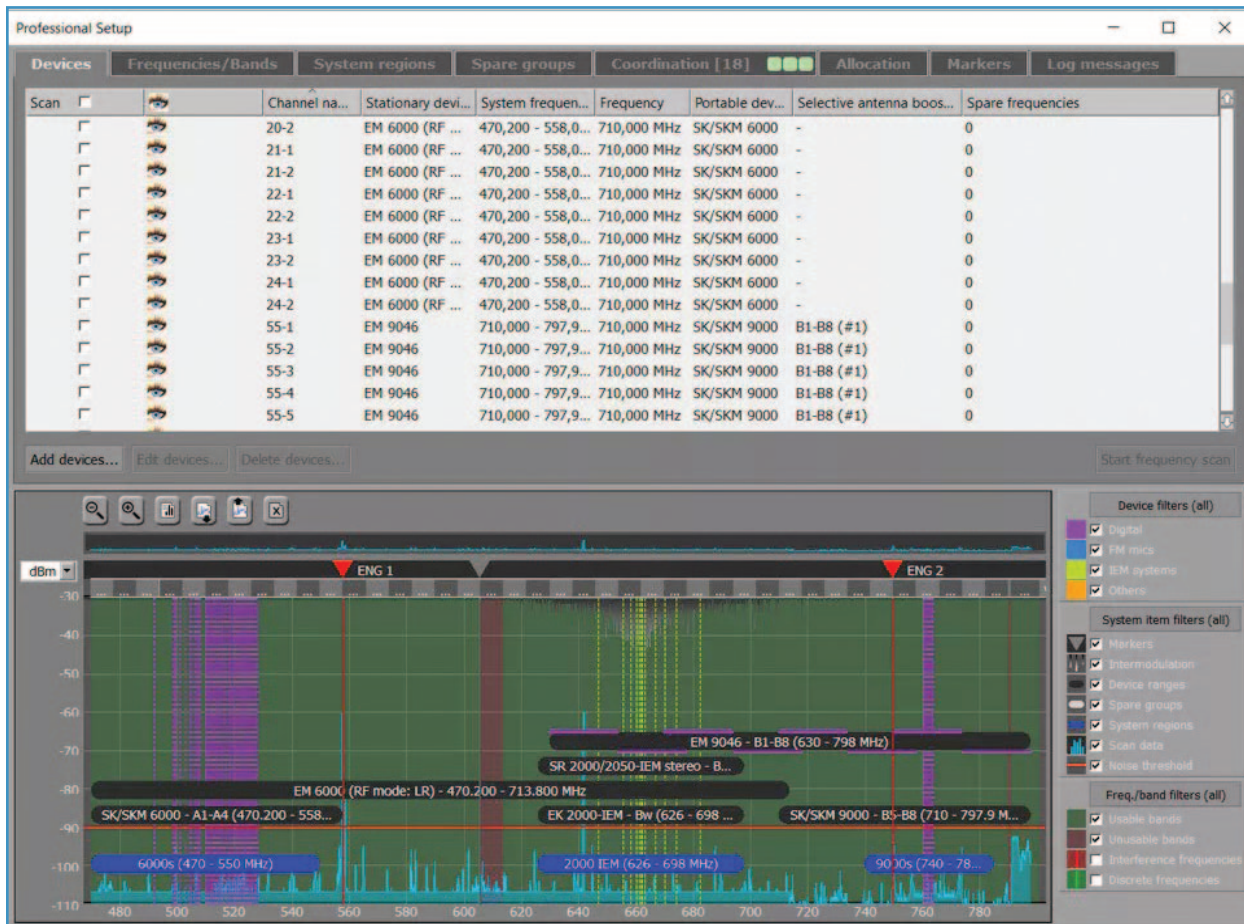


Control Cockpit with two handhelds.

Power-over-Ethernet capability; and OLED displays that offer improved fidelity compared to the EW-D's conventional LED windows. And, of course, the new systems retain compatibility with Sennheiser's user-friendly Smart Assist App, which uses Bluetooth Low Energy to provide full control from up to 75' and is scheduled to be integrated starting in October 2023.

All in all, the EW-DX offers features that almost match those of the company's flagship—and more expensive—Digital 6000 wireless system, which also offers intermodulation-free operation with an equidistant frequency grid to ensure trouble-free transmission paths even in crowded or very narrow RF frequency ranges.

For this review, LSA was sent the EW-DX 835-S handheld set, which comprises an EW-DX EM 2 receiver;



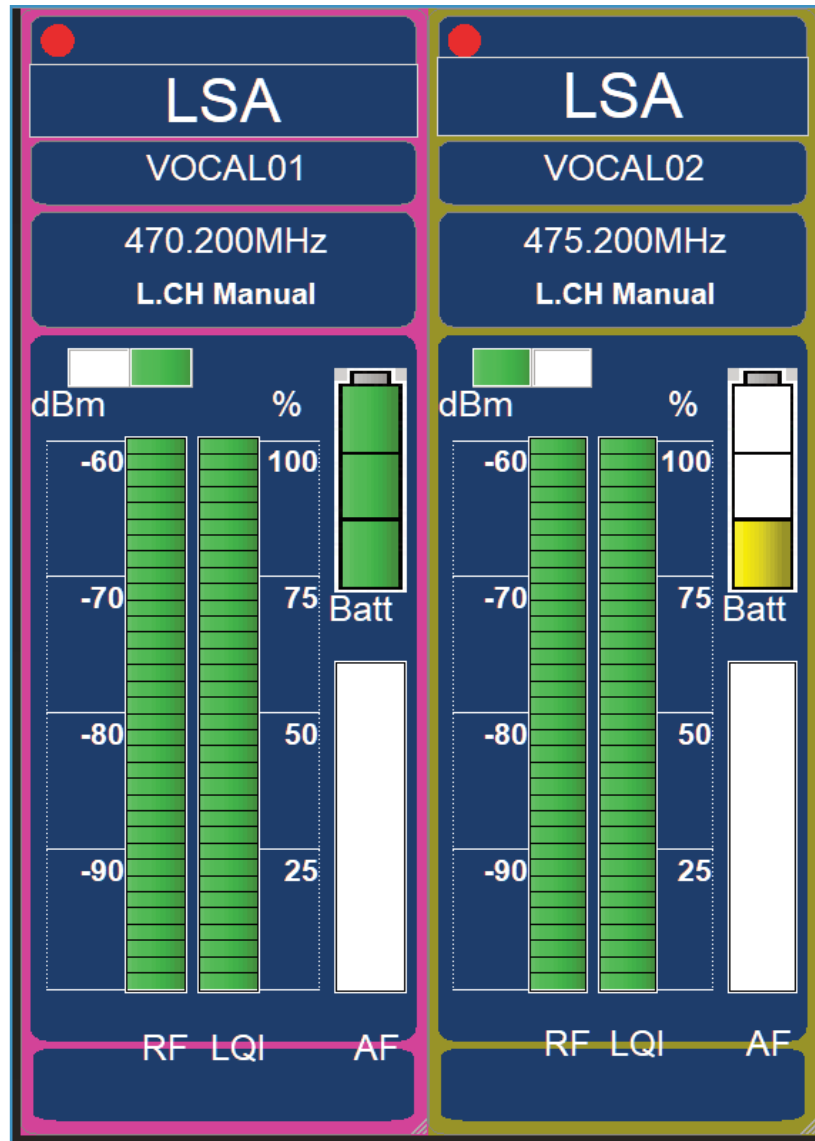
Wireless Systems Manager with large array.

two EW-DX SKM-S handheld transmitters with programmable mute switch; two MMD 835 microphone heads (dynamic capsules with cardioid patterns); two microphone clamps; an exterior power supply with multiple adapters; two BA 70 rechargeable batteries; two RF rod antennas; a GA 3 rackmount kit; and four rubber feet. The EW-DX MKE 2 lavalier set includes the same EW-DX EM 2 receiver and accessories plus two EW-DX SK bodypack transmitters and two EW-DX MKE 2 omnidirectional lavalier mics, while the EW-DX MKE 2/835-S combo set includes a receiver, a bodypack transmitter with omni lavalier mic, and a handheld transmitter with MMD 835 capsule, and the EW-DX SK/SKM-S base set includes a receiver, a bodypack transmitter, and a handheld transmitter. All sets are available in three variants for the US market: Q1-9, for the 470.2 to 550MHz range; R1-9, for the 520 to 607.8MHz; and V5-7, for the 941.700 to 951.800MHz, 953.050 to 956.050, and 956.650 to 959.650MHz ranges, excluding additional frequency variants for use in other parts of the world. Something for everyone, it seems.

EW-DX EM 2 two-channel digital UHF wireless receiver

Housed in a rugged, half-rack/9.5" 1U package, the receiver is fully compatible with all Evolution Wireless Digital Series handheld, body-pack, and table-stand transmitters. Both balanced XLR and unbalanced 1/4" analog outputs are provided, with an RJ-45 port for Power over Ethernet and integration into control and monitoring networks. An OLED display shows both channels at a glance while a link-quality indicator helps avoid surprises.

Powered from an external 12V/1A PSU, the receiver can be set to scan the local RF environment and implement equidistant channel spacing to deploy TX frequencies. Sennheiser Control Cockpit and Wireless Systems Manager (WSM) via Ethernet offer



WSM display with two handhelds.

powerful remote control, while a very clever Smart Assist app for iOS- and Android-compatible devices, available from October, enables remote system monitoring via Bluetooth Low Energy/BLE. All handheld and body-pack transmitters support in-device charging using the optional CHG 70N, with a full 12-hour battery operation from rechargeable batteries—around eight hours from AA cells.

Courtesy of the proprietary Sennheiser Performance Audio Codec/SePAC, all EW-DW systems offer a low latency of 1.9mS and a

134dB input dynamic range, which eliminates the need for gain setting. Also new is equidistant channel spacing across the supported 88MHz spectrum, which streamlines the allocation of intermodulation-free channels with secure RF transmission using AES 256 encryption to protect confidential audio content. Standard Mode offers 600kHz spacing to provide a maximum of 146 RF channels, while Link Density/LD Mode features 300kHz spacing to allow large, multi-component systems with up to 293 RF channels.

Power over Ethernet enables the support of downstream add-ons; Audinate-compatible digital outputs, via the CAT-6 port, are also offered. (A 19" 1U four-channel EW-DX receiver, available in late 2023, will add even more connectivity.)

The receiver's user interface shows clearly labeled parameters on a high-resolution OLED display, with jog-wheel navigation and control buttons plus extended menu settings that include a custom frequency list and selectable sync parameter. A useful Link Quality Indicator/LQI, inherited from the D6000 Series, displays the quality of the RF links separate from RF levels, while a new front-panel headphone port features a level control and channel 1 or 2 selection to the left-hand output. (I wondered why switchable routing to only the left ear was offered until I realized that checking audio output from receivers at the front of house, for example, shouldn't disturb monitoring of in-house sound via your right ear.)

EW-DX SK digital UHF wireless handheld transmitter with MMD 835 capsule

The EW-DX SK handheld transmitter operates for 12 hours from a BA 70 rechargeable battery, or up to eight hours from a pair of standard AA cells. Depending on the quality of an RF environment, the transmitter has a range of up to around 300', making it just about perfect for large stage layouts. Automatic multi-channel RF setup is featured, as well as AES-256 data encryption for secure audio. With overcrowded RF spectra in urban areas, the ability to pack so many 600kHz equidistant RF bands with dramatically reduced intermodulation products into the available 88MHz is a definite bonus, not to mention close to 300 slots in LD Mode. (The only downside, Sennheiser points out, is a 10% range reduction but without audio compromises.)

Available in two versions—with a noiseless, programmable mute switch (EW-DX SKM-S) and without it (EW-DX SKM)—the switch can be programmed as "off," AF Mute, and RF Mute, the latter letting you change settings inaudibly or keep a spare mic ready for use. A choice of 14 Sennheiser and Neumann microphone dynamic/condenser capsules is offered.

EW-DX SK digital UHF wireless body-pack transmitter with lavalier mic

Two body-pack transmitters are available: one with a 3.5mm jack for mics and instrument cables and the other for mics with a special three-pin connector. Body packs connect to all digital-proof Sennheiser clip-on and headset mics plus the Neumann MCM system and digital-proof third-party models. A trim control lets you alternate body packs on the same receiver channel—to accommodate multiple guitars, for example—and retain the same audio level; three-step cable emulation is also available.

Uniquely, All EW-DX Series transmitters feature e-ink displays that, even when turned off, display essential transmitter data, including name and operating frequency. An adjustable low-cut filter reduces handling noise or vocal pops; settings are "off", 30, 60, 80, 100, and 120Hz. Display brightness can be changed, and system settings locked out, while for intimate stage settings, a green status LED can be turned off. All transmitters include contacts at the base for in-device charging of a BA 70 battery, together with a built-in test-tone generator.

A two-bay, stackable L 70 USB charger with PSU can recharge a pair of BA 70 batteries while the CHG 70N can charge two stand-alone batteries or two transmitters simultaneously. An EW-D ASA active antenna splitter, EW-D AB antenna booster, and ADP UHF passive antenna also are available. The current EW-D power distribution

cable and matching NT 12-35 CS PSU will power up to four EW-DX EM 2 receivers.

System setup and wireless operation

The EW-DX 835-S handheld set ships in a narrow box with an internal card-board tray that holds all system components. Having also received an optional L 70 USB charger, I immediately started to charge the supplied pair of BA 70 batteries. In the meanwhile, I inserted a pair of AA cells into each of the handheld mics—the barrel unscrews to reveal the battery holder. Later, I swapped these for a recharged BA 70 battery—users need to be careful because the latter can be a tight fit but eventually will snap into place.

Manually setting up RF frequencies is a breeze. The receiver auto-scans the local RF environment and shows unused frequencies. I elected to leave one mic on its default 470.200MHz setting and to set the other one for 475.200MHz operation. Having powered up the handheld via a small on/off button on its base, I unscrewed the barrel to reveal an array of four small adjustment buttons close to the capsule. Hitting the scan button on the bottom of both mics triggers the receiver to move frequencies to match. No line of sight is required, nor is accessing the receiver rack to ensure each transmitter can synchronize with the master receiver via Bluetooth. Nice!

But if you work regularly with larger rigs, Sennheiser's Wireless Systems Manager/WSM software for Apple and Windows-compatible PCs is highly recommended to streamline RF spectrum scan, system setup, and frequency coordination, since it enables remote monitoring and control of all parameters via the rear-panel CAT-6 port. Usefully, all important parameters, such as level adjustment, are displayed on a single screen. WSM data can be shared across six PCs, tablets, or laptops. I could define system

regions within the RF spectrum scan and control wireless mics—plus IEMs—on a system display. Frequencies can be assigned either manually or automatically; licensed frequencies also are covered. I could choose which individual settings to exchange; if I only wanted to change a TX frequency, all other parameters remained untouched.

To access firmware updates, it was recommended that, prior to first use, I should download the Sennheiser Control Cockpit software on a Windows PC, which, like WSM, also enables full interrogation and control of all key system parameters. Of the two apps, I found SCC to be more user-friendly. The new EW-DX CHG 70N charger offers full monitor/control via SCC.

Once integration with EW-DX is supported, the Smart Assist App for iPhones will also enable system changes to be made remotely but, because the user interface is rather small, I might instead opt to use a PC. Having said that, Smart Notifications will provide troubleshooting tips, plus alerts for audio clipping, low-battery

state, taken frequencies, muted transmitters, and unlinked devices – together with suggestions to solve the problem. So it goes.

All in all, these new additions to the Wireless Digital family represent valuable, easy-to-use resources that dramatically reduce the complexities of UHF wireless operation. Priced at \$2,599 MSRP/\$2,199 MAP, the new EW-DX 835-S Handheld Set ably demonstrates that Sennheiser takes the live-performance market seriously and is committed to advancing state-of-the-art with powerful, user-friendly enhancements. And end-to-end audio quality is outstanding. A system to be coveted, I would suggest.

Mel Lambert has been intimately involved with production industries on both sides of the Atlantic for more years than he cares to remember. He is principal of Content Creators, a Los Angeles-based copywriting and editorial service, and can be reached at mel.lambert@content-creators.com; 818.807-2636. He is also a long-time member of the UK's National Union of Journalists. 