KENWOOD

NEXEDGE®
THE ENTERPRISE NETWORK SOLUTIONS

Leading the way in professional radio communications

The company formerly known as Kenwood started by repairing, assembling and selling radios. From those humble beginnings, it grew to become a household name. Then, in October 2011 it became part of JVCKENWOOD, celebrating its 70th anniversary in December 2016.

The famous KENWOOD brand lives on, of course, and among the outstanding products to bear its name is the NEXEDGE Series. It's now ten years since the debut of these digital two-way radios employing the NXDN protocol. And to mark this anniversary, we have compiled a white paper detailing the past, present and future of NEXEDGE and its market.

Always conscious of the trust invested in us by our customers, we are committed to building on our past achievements – drawing on all the experience and expertise we have gained over the years – to ensure that NEXEDGE continues to lead the way in the world of professional wireless communications.

The radios have changed beyond recognition, but unchanged is the way in which the KENWOOD transcends boundaries with innovation and determination. We're redefining NEXEDGE as "A new path to digital" – offering true multi-protocol support that meets the varied needs of our customers. It's important that this message reaches as wide an audience as possible. Because, you see, NEXEDGE is the future of digital radios.

10th ANNIVERSARY NEXEDGE®

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True multi-protocol support that meets the varied needs of customers. This is the start of a new chapter in the history of NEXEDGE, launched 10 years ago.

EXECUTIVE SUMMARY

When it comes to choosing professional communications equipment, one problem facing many companies and organizations is which protocol to go with. Currently there are three international standards for digital wireless: NXDN™, Digital Mobile Radio (DMR), and P25. Among the many issues to be considered are compatibility between the new digital system and any analog radios already in use. But more important is whether the system is future-proof.

No manufacturer is more keenly aware of the needs of today's market than JVCKENWOOD, which has developed and marketed the NEXEDGE® Series. Ten years ago the NEXEDGE brand was launched using the NXDN CAI (Common Air Interface). NXDN soon became the de facto standard in a wide range of fields and industries, but in March 2017 it was officially recognized by the ITU as an international standard for professional wireless communications. Nevertheless, in developing the NX-5000 lineup JVCKENWOOD has embraced not only NXDN but also the DMR and P25 digital protocols. NEXEDGE is now tri-mode.

As a true multiprotocol supporter, JVCKENWOOD is unique in the industry to offer a tri-mode brand. Embarking on a new chapter in the history of the company, it will supply professional radio system solutions that offer flexibility and scalability. The ultimate aim is to promote global growth in the use of digital two-way radios.

THE SITUATION

For any organization using legacy analog radios in its daily operations, the unavoidable drive to digital is complicated by a market in which multiple standards coexist. As well as trying to navigate a seamless upgrade path – often requiring analog/digital interoperability – it appears necessary to make a firm choice of protocol even before the brand/product selection process. But even if the chosen protocol seems the right fit today, will that still be the case five years from now? Not only does the technology progress, organizations themselves change and grow, making scalability another important criterion.

THE FACTS

For someone contemplating an investment in digital two-way radios there is a choice of three international protocols. These differing standards do, however, have some advantages in common. For example, digital mobile radios typically offer better coverage than analog – that is, instead of fading as signal strength decreases, audio quality is maintained up to the edge of the coverage area. Also, digital signal processing means that audio is clearer, with much less noise. Improvements can be expected in capacity, using FDMA or TDMA technology, and in security. Users can also look forward to advanced functionality, such as GPS-based applications and SMS messaging. Nevertheless, it is important to grasp the differences between these protocols before making a choice.

NXDN

The NXDN Common Air Interface (CAI) was conceived by Kenwood Corp. (now JVCKENWOOD) in cooperation with Icom Inc. to offer an alternative for the Land Mobile Radio (LMR) industry that would facilitate development of more affordable digital radio products satisfying the FCC narrowbanding mandate. The first KENWOOD product appeared ten years ago. NXDN employs Frequency-Division, Multiple-Access (FDMA) technology in which two or more communication streams run concurrently. This scheme is robust and is not susceptible to timing problems. It also provides wider coverage, superior multipath characteristics and high spectrum efficiency: 6.25 kHz dual-channel systems can be configured to fit within a 12.5 kHz channel. Two NXDN channels can be allocated as voice/voice, voice/data, or data/data. And because NXDN systems support mixed digital/analog operation, they facilitate smooth migration. The advanced AMBE+2 vocoder (codec) is used for digital audio. Compatible products from other manufacturers must conform to the mandatory features and standard optional features specified by the NXDN Forum; details are provided on the Forum website (http://www.nxdn-forum.com/what-is-nxdn/nxdn-a-brief-overview/).

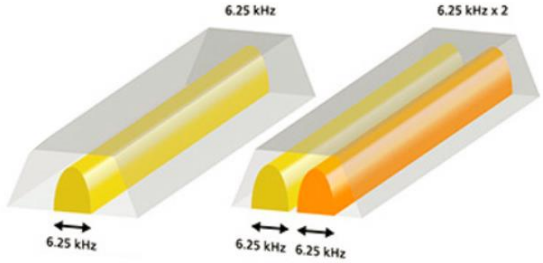
NXDN recognized as international standard by ITU

In 2017 NXDN was accepted by the International Telecommunications Union in its Radiocommunications Sector (ITU-R) report M.2014. This publication is highly significant since it represents official recognition by the UN agency of NXDN as an international standard.

DMR

Digital mobile radio (DMR) is an open digital radio standard developed in 2005 for professional mobile radio (PMR) users by the European Telecommunications Standards Institute (ETSI). It employs 2-slot Time Division, Multiple Access (TDMA) technology in which a single carrier frequency is shared by dividing the signal into time slots to increase channel capacity, while also enabling independent and private talk groups. DMR radios provide smooth communications and coordination in a wide variety of commercial environments, including retail, hospitality and manufacturing. The DMR AIS IP Console Interface facilitates radio dispatch operations, while Call Interruption and the Lone Worker function are ideal for security guards. Digital DMR Data Services and Remote Monitoring are among many additional benefits.

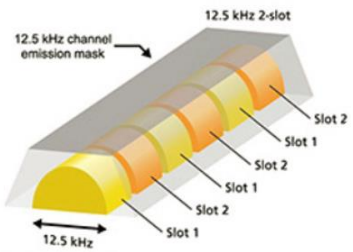
In December 2017, JVCKENWOOD acquired all the shares issued by Milan-based Radio Activity S.r.l., a company that develops and markets DMR systems.



NXDN™

FDMA 1 voice path @ CH

Two 6.25 kHz spectrums can be accommodated



DMR

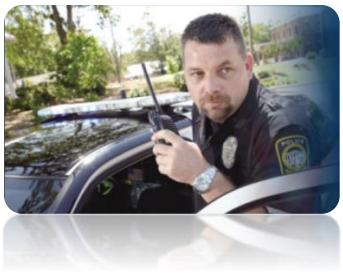
Two talk paths

TDMA 2 voice path @ CH 12.5 kHz

P25

Project 25 or P25 was developed as a suite of standards, emphasizing interoperability, for the digital mobile radio equipment used by public safety organizations in North America, Australia and New Zealand. Round-the-clock operations – involving the police and fire departments as well as EMS – can be extremely demanding for both personnel and equipment. P25 radios need to be ruggedly robust and able to offer clear mission-critical communications in challenging environments. Features like Man-down Detection contribute to enhanced safety in the line of duty.

In 2012, P25 Phase 2 was launched, signaling the adoption of the AMBE+2 vocoder and ability to operate two voice channels within 12.5 kHz bandwidth using TDMA.



NEXEDGE

Since its launch the NEXEDGE Series has offered digital conventional and trunked radio solutions for general commercial use. In 2015 the next chapter in the history of the brand opened with the debut of Gen2, the second generation of NEXEDGE products. Users could now invest in an extensive, highly scalable digital trunked network system with the potential to provide statewide/nationwide connectivity. Large corporations and public utilities are among those to benefit from the ability to link up to 1,000 sites or 24 networks.

The NEXEDGE NX-5000 Series supports all 3 digital protocols – NXDN, DMR and P25 (Phase 1 & 2) – plus FM analog in a single radio. Moreover, a desired CAI can be selected at will, giving users the freedom to migrate at their own pace – whether they are intent on going fully digital, undecided about which digital system to pick, or just wanting to maintain both digital and analog for the time being. An NX-5000 radio can simultaneously support two digital protocols plus analog, offering the following combinations: FM/DMR/NXDN, FM/NXDN/P25, and FM/DMR/P25.

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THE SOLUTION

Organizations experience many changes – acquisitions, expansion, structural reforms – and up till now it has been a challenge to pick a digital communications system that will reliably serve their needs today and tomorrow. There have been concerns about being locked into a disadvantageous digital protocol or one that will not scale up to allow for future growth. But NEXEDGE answers all these concerns.

Different industries, companies and organizations may vary considerably in their requirements for a radio system, but they can all find products that meet their needs in the multiprotocol NEXEDGE Series. It offers "A new path to digital" for users of legacy analog systems. No other brand provides tri-mode support. NEXEDGE thus represents the future-proof solution. Because these radios are compatible with three different digital protocols – NXDN, DMR and P25 – an organization planning migration from a legacy system can continue to use their current radios and also be confident that, when the time comes to go fully digital, their NX-5000 radios will be deployed and ready.

NEXEDGE radios have established an enviable track record over the last decade. For example, when Lithuania's Ministry of Health decided to develop a mission-critical digital radio communications system to provide nationwide coverage, NEXEDGE was chosen following comprehensive testing, evaluation and competitive tendering. This resulted in the phased deployment of Europe's largest NEXEDGE digital trunking system. Dekbera's RadioNET network now covers over 90% of the country's 65,300 km² landmass and around 92% of its population, allowing its main client, the Lithuanian Ambulance Service to stay in contact with its furthest outposts. NXDN is key to the creation of such large-scale trunked networks, and the NEXEDGE Series makes the most of this potential.

CONCLUSION

KENWOOD's NEXEDGE Series of professional digital two-way radios launched in 2008, making 2018 its 10th anniversary. Over the last decade, NEXEDGE has evolved to include not only Gen2 products but also support for the DMR and P25 digital protocols. As well as winning a reputation for high performance and reliability, it has thus redefined the market for digital communications, cutting through the confusion of multiple protocols to offer a one-stop solution that is truly future-proof.

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