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DIGITAL EDITION

Dear Evan Hansen

A very modern musical
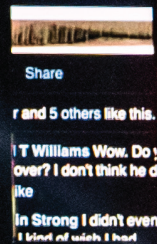
plasamedia

ON TEST

City Theatrical's Multiverse

### Richard Cadena tests the wireless RDM/DMX system . . .

In 2016, Gary Fails, founder and CEO of City Theatrical, held a press conference at LDI, Las Vegas to announce the launch of a new wireless DMX product called Multiverse. At its heart was a tiny integrated circuit chip mounted on a very small circuit board. It looked very promising, but we would all have to wait to get our hands on it. A few years later, the full product line is finally here.

The range includes the Multiverse 5910 Transmitter, Multiverse Node, Multiverse Gateway, and Multiverse Module. I was finally able to get my hands on them to test them out and, in short, they are easy to set up and use and work really well. The system is well thought-out and has lots of features.

The Multiverse 5910 Transmitter can wirelessly transmit up to nine universes of DMX/RDM: five in the 2.4GHz band and four in the 900MHz band. Someone asked me why this is a big deal, and I can think of at least two reasons: first, it replaces nine transmitters with one, saving space and set-up time; second, it automatically coordinates the frequencies so that it minimises interference, using something called SHoW Key Security to ensure that other City Theatrical SHoW wireless DMX systems do not interfere. The Ethernet input port allows it to receive sACN or Art-Net, obviating the need for multiple DMX inputs. It even has Power over Ethernet (PoE) so you can avoid having to use the power cable, powering it through the Ethernet cable if it's fed from an Ethernet switch that has a PoE power supply.

Even though it outputs nine times more universes than other wireless DMX systems, it uses some clever compression techniques to reduce the amount of radio energy it outputs. Fails talked about this feature two years ago during a presentation at LDI. It can be set up so that it only transmits changes in DMX values instead of repeating the same, unchanged DMX values over and over again. Ordinarily, a console repeats the DMX data up to 44 times per second, regardless of whether any of the values have changed. With a wired system, this has no ill
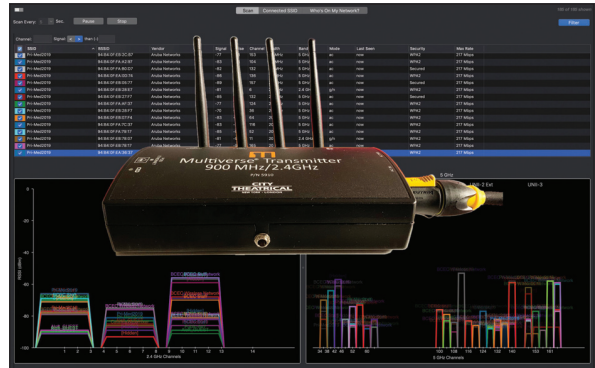
↑ The Multiverse Transmitter can transmit nine DMX universes (5x2.4GHz and 4x900MHz) and uses several techniques that help it work well even in challenging conditions
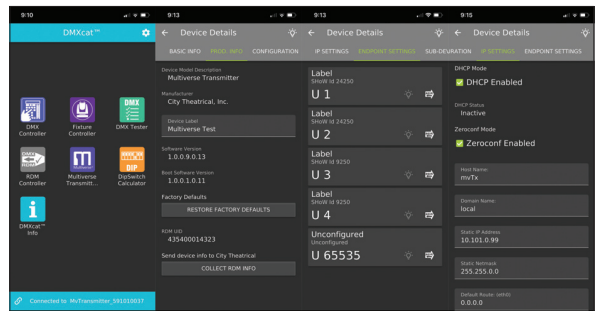
↑ The configuration screens in RDM display the configuration settings in a simple layout format

consequences, but when you're trying to share the wireless spectrum with other wireless systems - like audio, WiFi, wireless monitoring, etc - it's not a very effective use of bandwidth. But, how well does it actually work? That's the question I set out to answer when I received the demo package.

As with all wireless systems, one of the biggest potential problems is interference, and tradeshows are the worst

← The Multiverse 5910 Transmitter (far left) and Multiverse Node

"The reception was strong and steady, despite the crowded frequency band . . ."

environments for this. Fortunately, I happened to be in the Boston Convention and Exhibition Center during a medium-sized show, so I could test the system in a fairly harsh environment. I scanned the 2.4GHz and 5GHz bands and found they were both very crowded. Perfect.

Setting up the Multiverse Transmitter and the Multiverse Node as a receiver was easy. I already had the DMXcat app on my iPhone, and since the transmitter has a built-in DMXcat, I was able to connect it to my phone via Bluetooth and discover it using RDM. It was so intuitive that I never had to break out the user manual, with one small exception. When I accidentally connected a device to the input of the Node instead of the output, it automatically went into 'transmit' mode. I didn't realise my mistake until I read the manual. As soon as I disconnected it, it went back into 'receive' mode.

Then I walked it away from the transmitter to see if I could get a signal in the middle of the tradeshow. At a distance of about 175ft, transmitting through a dry wall and two sets of glass walls, the handy signal strength icon on the backlit LCD screen on the face of the node was showing three out of four bars, which means 50% or better. I thought I was using 900MHz, but I later realised it was actually the 2.4GHz band. I would likely have got much better results with 900MHz, because the lower frequencies travel further and penetrate obstacles better than 2.4GHz. There is also a lot less interference in the 900MHz band.

Next, I walked the Node all the way down the hallway as far as I could go, which was about 500ft. It was easy to do because the Node is only about 4" tall by about 2-1/4" wide and weighs about 6oz (10cm x 6cm, 170g). I did have to find an AC outlet to power it.

In a perfect scenario, I would have elevated the transmitter and receiver about 8ft above the floor, because that's the best location for the strongest signal. The transmitter and node both come with an attachment plate that makes it easy to mount on a grip stand, truss, pipe, or some other structure. In this instance, I just set the transmitter on the floor and the receiver still showed three out of four bars of reception.

⬆ At a distance of approx. 500ft, I had good signal strength using the 2.4GHz band in a crowded space

Again, I thought I was on 900MHz, but it was actually 2.4GHz, and I was using the omnidirectional antennas that came with the units. To achieve greater transmission distances, you can use directional antennas.

The reception was strong and steady, despite the crowded frequency band. There are a few reasons for this. First, I was using the highest power setting; you can dial this down if you don't need to transmit over extremely long distances and this will lessen the likelihood of interfering with other wireless. This is an important feature in today's production environments, where other crews are working hard to get their own wireless (audio, monitoring, lens focus, etc.) to work. Second, Multiverse also has user-selectable adaptive spread spectrum frequency hopping, which changes the transmission frequency several hundreds of times every second and monitors the spectrum to avoid frequencies with interference. Third, it uses forward error correction.

There are many more features in the system; one of my favourites is the built-in WiFi that allows you to connect to it to a tablet and use Luminair or any other relevant tablet app to control your lighting system. One thing that makes its configuration easy is that it has RDM, which offers quick access to a number of settings - for example, turn DHCP on or off, change the IP address and subnet mask, assign DMX universes, label the settings, and more.

Another component of the Multiverse family that is really interesting is the Multiverse Module, an integrated circuit chip that manufacturers use to integrate wireless DMX into their fixtures. It's inexpensive enough that it's likely to become ubiquitous. The wireless revolution will not be televised, but it will be broadcast, and it's now underway. Stay tuned . . . ⊗

◀ **www.citytheatrical.com**