

ON TEST

Wisycom MPR50-IEM and MTK952 Wireless IEM Solution

Sound engineer Simon Allen puts Wisycom's new professional IEM solution to the test



ABOUT THE EXPERT
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Wireless considerations for shows of any size can cause the biggest headache. As we all know from first-hand experience, the number of channels required, coverage and RF interference can seriously jeopardise a production. That's not to mention the increasing rules and regulations we must follow when using any wireless technology. The moment wireless equipment is needed for a production, we all get those little alarm bells ringing in our heads, which leave us planning how we're going to achieve a reliable solution.

Thankfully, technology has improved greatly and now most of the well-known manufacturers offer solutions in at least their third generation. However, we are still left with many considerations and inevitable teething issues. In our roles as sound engineers and technical crew working in the arts, we already need to be competent with modern computer technology, even just to edit an EQ. We are ultimately the link between the art and the technology, which in-turn delivers the performance to the audience. As part of that job description, we're also expected to have a degree-level understanding of RF technology.

Is there a simpler way? There has to be a solution that at least minimises the stresses we face; a solution that can meet the specifications required for any date on a world tour, without the need for multiple RF packages. Surely there's an IEM system for performers which they can rely on? Working 'behind-the-scenes' we will never know what it's like to be a performer and suddenly feel isolated, because your IEM receiver has entered an RF dead patch. Some fresh thinking has been required for some time, and Wisycom may just have the answers . . .

FROM F1 TO STAGE

The systems we are already using in live sound have been significantly improved through their generations, but it's no secret there are limitations and performance issues. There are, of course, boundaries that simply go hand-in-hand with RF technology, but as with any technological advancement, we need something that will work within these boundaries whilst providing enhanced performance. We might think running a show with 25 cast members, all on wireless microphones and IEMs, is a challenge, but of course we haven't got it quite as bad as some broadcast applications. Specifically, Formula 1.

F1 proves to be the ultimate testing ground for wireless applications. Broadcasters from all around the world attend every F1 stage, and the racing teams themselves use wireless comms and data links to the cars. Each broadcaster uses several channels for wireless microphones,

IEM monitoring and comms, with the pit lane becoming an RF soup. On top of the fight for clean RF bandwidth there are, of course, the inherent challenges of covering such a large area, often littered with inconvenient physical obstacles.

Wisycom has been designing and delivering wireless solutions for the broadcast industry, in particular providing RF solutions to F1 since 2012 via Wisycom's UK official partner, Raycom. This is proven technology which has cut its teeth in the broadcast world, including on some big productions such as major film sets, *I'm A Celebrity* and, of course, F1. Thanks to the RF challenges faced at such events, Wisycom's technology presents some significant benefits over what I will refer to as 'our' current tech in the live sound world.

The great news here is that Wisycom believes it can answer some of the troubles we face in live sound and has released a number of products for our industry. This includes its latest IEM system, which comprises the MPR50-IEM belt-pack receiver and the MTK952 dual-channel stereo transmitter. I have been lucky enough to try this system and to understand, within the limits of my sound engineering knowledge, the benefits that it offers.

SYSTEM OVERVIEW

At first glance, the MPR50-IEM belt-pack receiver and MTK952 dual-channel stereo transmitter look just like any other professional IEM solution. They offer all the usual features and methods of operation that we're already accustomed to; anyone who knows their way around a Sennheiser or Shure IEM system will immediately feel at home with this. I think that's really important and will help our industry adopt what is, underneath the user interface, quite different technology. Many broadcast products try and venture into the live sound world and fail, simply because not enough effort was put into the front end.

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The first difference we notice, however, are two antennas on the belt-pack receiver. Sennheiser, for example, states that the headphone cable plugged into its belt-packs act as a second antenna. There are, of course, other dual antenna receivers around. The major difference with the MPR50-IEM is that this is the first true diversity receiver we've ever had. This means that as well as the two antennas, there are also two receivers inside the pack. The strongest signal from the two receivers is then calculated and sent to the headphone amplifier.

The MPR50-IEM is ever-so-slightly larger than perhaps some other brands, but it is still very compact and extremely robust. The build quality is excellent, with a smart screen and front panel controls. I also found the simple belt clip to be really effective and easy to use. A small detail, but a big one when it comes to running around on stage with one.

The only surprise for me is that they've built a true diversity unit, but placed the antennas only a few centimetres apart. However, during my testing I can certainly say that it works. I had to go a very long way from the transmitter before any slight RF noises



➔ MPR50-IEM receiver



➔ Front and rear of the MTK952 transmitter



were apparent, and walking around several buildings with complicated structures had hardly any effect on the reception, if at all. Raycom claims the true diversity technology roughly provides "40% more range and greater reliability".

The obvious way to increase coverage is to emit a stronger radio signal. This is, of course, limited by regulations - in our live sound world, the limit is a standard 10mW signal (or 50mW for body-worn). However, the MTK952 transmitter is capable of providing a signal up to 2W, which - according to the experts - should easily cover three miles. The power output can be managed from the front panel of the transmitter, but of course you would need to check the regulations for your event and acquire any necessary licenses. However, it's good news that the power is there.

As a slight side note for a few, Wisycom is also developing an RF-Over-Fiber solution in the form of the MFL Fiberbox BX1-4U. This is, again, new technology which the majority of our industry isn't likely to need, but it might prove useful for stadium shows, multi-stage festival sites or even to transmit broadcast signals from a site. However, it's interesting to note these advancements and that the tech isn't just coming, it's already here.

Another, as yet unseen feature this IEM solution offers is the wide tuning range. Every system ships with a 232MHz bandwidth in the 470-798MHz range. This answers so many issues we face on a daily basis when it comes to which channels we can use where. In particular, it will permit any touring shows and any rental equipment crossing from one territory to another, able to fall in line with different regulations. The tours that have to travel with two sets of RF racks plus all their redundancy could make huge savings with a system like this, only requiring a single rack. Wisycom is also at the forefront of working with the authorities for more available RF spectrum. Apparently, the company is already in talks to look at using a new DME band, where more channels might become available. This might not effect us now, but certainly places confidence in Wisycom.

When it comes to setting up and tuning these units, they operate in the same way as most other modern wireless equipment. Scanning a location for available

frequencies is possible, of course, and each unit comes with pre-programmed inter-mod channels for the entire bandwidth. For the 232MHz bandwidth, that's a total of 40 groups of 60 channels. Setting the transmitter and receiver to the same channel is done via the IR sync method we're already used to. Coming soon (I understand as an update available for these units) is a narrow bandwidth option. This new technology will take the standard 200kHz bandwidth for each channel down to 100kHz, providing twice the number of channels. This has been achieved by significantly reducing the RF noise floor. This is quite exciting considering the reduction of channels.

MUSIC TO MY EARS

All the technicalities about bandwidth, coverage and avoiding drop-outs thanks to true diversity is fair enough, but none of this would matter if the units



sounded terrible. IEMs in particular are required to give a performer the full sonic bandwidth, a good dynamic range and low latency. These are areas that have historically been overlooked, or sacrificed for technical reasons, in the broadcast world. However, Andy Clements and Piers Easton at Raycom are keen to explain that these latest products place a great deal of focus on sonic performance.

- From top:
- The system in use for Lukas Graham at Østerbro Stadion
 - ACM50 Rack Battery Charger
 - CSI16T RF combiner
 - LNNA wideband UHF antenna

Pyers used the phrase "only as strong as its weakest link", when discussing the technicalities involved in designing such transmitters and receivers. The problems all manufacturers face when designing a wireless IEM system (or wireless microphone for that matter), are the various stages required to 'move' the audio signal. For example, just to mention a few stages: there's an AD converter followed by data compression, RF transmission, detection and data expansion, DA converter and, finally, the headphone amp. This very basic outline demonstrates the number of instances for signal degradation, especially after appreciating the gain staging required throughout as well. Pyers was confident in explaining that Wisycom has invested a lot of effort in all these areas and believes the results speak for themselves.

I'd certainly have to agree with Pyers. The resulting sound from these units is excellent. With my 'studio ears' on I could be picky, but that isn't fair. In comparison to my experience with other IEM systems and the world of live sound, this system is very impressive. There is a very clear stereo image with a good dynamic range. Sometimes, as I'm sure we all have, I've had singers in particular ask to remove the compressor from their voice - even if you haven't used

WISYCOM IEM SYSTEM TECH SPEC

FEATURES

- ▶ Up to 232MHz bandwidth in 470 to 798MHz range
- ▶ True Diversity Receiver with two whip antennas
- ▶ 200mW peak audio power
- ▶ Separate release/attack compander
- ▶ Miniature design with 2 AA battery pack integrated (body-pack form factor) or rechargeable lithium pack
- ▶ Dedicated function buttons & frequency scan function
- ▶ 128x64 OLED (white) display
- ▶ FM Stereo MPX decoding with mix-mode function
- ▶ Automatic transmitter programming through infrared and micro-USB
- ▶ Weight: 100g approx. without batteries

one at all. Equally, tonal changes don't always get reflected on some lesser standard IEM systems, without dramatic EQ curves. With these I was able to make EQ adjustments and clearly hear the effect of the EQ.

The idea that the complete chain of events in these systems has to be high quality and accurate isn't new thinking. We all know as sound professionals that your signal chain has to be as good as possible from start to finish. The efforts that Wisycom has put into all the tech inside these units is apparent. There's a lot of different technology that the company had to get right and pull together for these to be a success. Wisycom's experience in this field is certainly clear to the ear.

As well as the impressive dynamic range that has been achieved in AF and RF transmission, the headphone amp on the MPR50-IEM belt-pack is very clean and powerful. The amp is rated at 200mW peak audio power at 32 Ohms. You can even change the resistance setting of the headphone output to 16 Ohms. With this power and the extended dynamic range, I didn't experience any clipping or negative side-effects when using this system. There's plenty of headroom to play with, which is a pleasure compared with trying to squeeze an IEM mix that actually makes any sense into a singer's transmitter.

CONCLUSION

This is a more exciting product for the live sound world than many will realise. The technical advantages of the true diversity receiver and the system's extended bandwidth speak for themselves. This is a really reliable product that has been tested and proved in some of the most demanding scenarios. There are cost savings too, particularly for larger shows which may have otherwise required more than one RF rack to comply with different regulations. This will also be a benefit to rental companies, who will be able to offer a wide coverage of the usable RF spectrum with any number of these units.

Thanks to Wisycom's user interface and great build quality, it doesn't feel like this is an entirely new and alienating system. These units are ready for life on the road with any tour tomorrow, and the technicians won't need to spend ages learning about the new kit. Performers too are able to start using the belt-packs with ease, benefiting from the high sound quality. This is new tech that delivers a much-needed answer to several issues we are facing with wireless technology. What's really smart though, is how easy this will be to integrate. ☺

- ▶ www.wisycom.com
- ▶ www.raycom.co.uk