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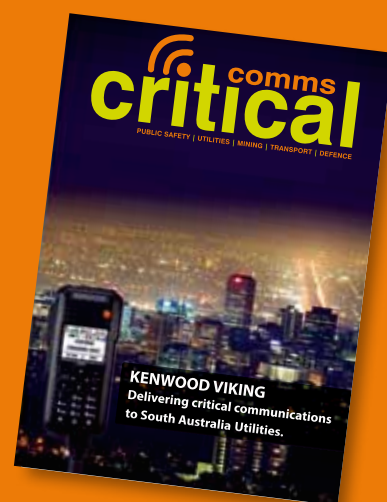
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## ON THE COVER



Critical communications within the utilities industry is the key to providing great service and keeping the lights on. Over the past 18 months Kenwood Viking radios have been doing just that by helping keep critical utilities in South Australia up and running.

Kenwood Viking radios were the first radios introduced on to the SAGRN after its initial rollout period and have been working nonstop since their introduction.

Kenwood Viking radios are continually undergoing development to provide end users and dealers with new feature options. In the latest update we've provided the ability to include CB channels on both portable and mobile terminals. Along with this, our new groundbreaking feature was also introduced to Viking multi-deck mobile units — the ability to operate under a single ESN across UHF and VHF networks thus providing seamless operations when roaming between networks.

Combining this with our leading Fleet management, onboard voice recording options for off network incident review and much more, the Kenwood Viking radios quickly become the clear choice for critical communications.

Contact us if you want to know how Kenwood Viking radios can help to bring your fleet into the future.

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After the hindsight of 2020, we hit the reset button for 2021 — but neither attempt to return to normality has appeared to work.

As we gingerly step into the potential minefield of 2022 we tentatively prepare for Comms Connect Melbourne, early in the year, March 8 to 10.

With a couple of months still to go there is, already, a great round-up of interesting speakers lining up at the conference from all over the world and from all aspects of the industry: from manufacturers to government; from visionaries to end users.

None more so than the keynote plenary speakers, with representatives from the USA's ambitious FirstNet program and First Lead for Microsoft Azure alongside Australia's own Shane Fitzsimmons from Resilience NSW and Neal Richardson from our partners across the ditch at Next Generation Critical Communications Lead Agency New Zealand.

Running in two streams the conference will feature 25 presentations looking at all aspects but featuring the massive future that is arriving in critical communications; from drones to 5G, the growth of satellite connection and the incredible growth and potential of digitisation. We live in interesting times.

At time of writing there are still some speaking slots available.

Adding to the forum action, there is also the exhibition with over 40 exhibitors already guaranteed. Personally, I love a good expo; nowhere else is there such an opportunity to get such a one-on-one with knowledgeable staff while not feeling you are in a sales meeting and under pressure.

There are product demonstrations, toys to play with and the possibility of a free cap, pen or mug! Maybe all three.

As editor of *Critical Comms* this will be my first Comms Connect. Had to miss the New Zealand show held earlier this year, unfortunately, but since Melbourne is my home town, I am looking forward to getting



down there and getting my hands dirty as I learn more and more about this dynamic industry.

Where else can you have a conference that discusses bushfires, space satellites and drones? What is there not to like.

See you there.

**Phillip Ross, Editor**  
cc@wfmedia.com.au

## March

Comms Connect Melbourne 2022  
8-10 March 2022

Melbourne Convention & Exhibition Centre  
melbourne.comms-connect.com.au

Bapco Conference and Exhibition  
8-9 March 2022

Ricoh Arena, Coventry, UK  
www.bapco-show.co.uk/

IWCE 2022

21-24 March 2022  
Las Vegas Convention Center, USA  
www.iwceexpo.com/

## May

Comms Connect New Zealand 2022  
11-12 May 2022

Te Pae Convention Centre, Christchurch  
www.comms-connect.co.nz

## July

Disaster & Emergency Management Conference  
25-26 July 2022

Royal Pines Resort, Gold Coast  
https://anzdmc.com.au

## August

APCO 2022  
7-10 August 2022  
Anaheim Convention Centre  
www.apco2022.org

*For a full list of industry events, see  
criticalcomms.com.au/events*





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Visit us at Comms Connect Melbourne at stand **108** for a conversation around your critical communication requirements to find out what could Velocity do for your organisation.





THE FUTURE OF 5G  
AND MINING  
INDICATIONS ARE THE  
POSSIBILITIES ARE MASSIVE  
BUT A LOT OF WORK STILL  
NEEDS TO BE DONE



A white paper analysis, conducted by 5G Americas, on the technical and market requirements of the mining industry, relevant to 5G.

**5** G technology is an anticipated game changer in mobile networking, promising exponentially faster download speeds and data sharing in real time.

The last generation of wireless cellular, 4G LTE, enabled connectivity of billions of smartphones with data service capabilities that have ushered in a new era of mobile applications, changing the way billions of people live around the globe. Now, 5G is promising to use the same LTE packetisation technology with significant improvements in the radio and packet core to connect things beyond phones.

Current 5G thinking is focused on details of technology such as ultra-low latency wireless connectivity or slicing of provider networks. While these details are interesting there are even larger effects looming on the horizon.

Another foundational enhancement in parallel with 5G lies in the application layers, made possible due to the availability of greater processing power more widely available through cloud hosting. This increased computational capability enables the application of intelligence to compute at nearly real time for many user interactions, such as: analytics, artificial intelligence and augmented reality.

Over the next several years, these transformational waves of high-powered computation are expected to change the way cellular networks are designed and cellular services are consumed. New business to business (B2B) relationships are expected to create novel opportunities and new types of service providers will likely emerge. New consumer form factors that enable new unimagined types of interactions will come to the market, such as wearables that take User Interface (UI) from primarily text/voice/video to new levels — much like what happened with 4G LTE and smartphones.

As enterprises consider their digitisation plans, they are keen to understand alternative and complementary wireless options. This is where discussions on private cellular networks start with enterprise verticals. Private cellular networks operating on 4G LTE have been in existence for many years, but mostly in limited venues where Wi-Fi is not a suitable option or where public cellular is not offered at the right price and required SLA in the right vertical — such as in mining. However, the introduction of 5G has been creating a renewed interest

in private cellular in recent years, due to its ability to improve wireless connectivity everywhere, both indoors and outdoors.

With that in mind, let's take a closer look at what enterprises are looking for in a 5G private cellular solution.

## Radio frequency spectrum

The first topic in virtually all wireless discussions in an enterprise involves the choice of radio frequency (RF) spectrum, specifically in terms of its characteristics for providing coverage and throughput at acceptable cost.

Sources of spectrum include:

### Unlicensed spectrum

Powers Wi-Fi networks: free and highly suitable for indoors and many outdoors venues, remains the primary choice for wireless among almost all enterprises. Enhancements introduced through IEEE 802.11ax (Wi-Fi 6) as well as expansion of the RF range through introduction of 6E aims to solve many existing problems with Wi-Fi, including congestion and interference. Wi-Fi range of coverage is limited due to its lower power requirements, and as such, it is considered not useful in vast areas where many access points will be needed to cover the same area that a macro cell can cover.

### Shared spectrum

A new category of spectrum that is issued by the regulators in which there is an existing incumbent who takes priority for usage of spectrum. These bands can provide more expansive coverage for outdoor use cases at a lower cost than licensed spectrum. However, there is additional complexity of potential interference with incumbent users which needs to be managed by a spectrum management system.

### Licensed spectrum

Owned and managed by cellular providers, it presents a rich and versatile set of spectral bands that can offer high throughput and expansive coverage for a fee.

Any combination of the above can be used to support complex use cases for an enterprise.

Availability of suitable RF spectrum enables or limits any wireless deployment and more spectrum is needed as wireless use cases grow in scale and complexity. Additionally, there are a few points about spectrum that do come up in discussion with enterprises, which include:

- higher frequency bands, eg, mmWave, that offer higher throughput at shorter distances and are sensitive to environmental factors, such as metal fuselage or caging. mmWave use cases can be similar to Wi-Fi 6 in terms of coverage

and performance, but mmWave uses licensed spectrum versus unlicensed spectrum used in Wi-Fi 6;

- lower frequency bands offer larger area coverage and lower throughput, but they are also capable of penetrating through RF challenged environments;
- mid band frequencies are very versatile as they can provide a good amount of throughput, a decent latency and resilience to environmental factors;
- most immediate outdoors use cases that can benefit from 5G involve mid band and lower band spectrum.

In all spectrum-related discussions, cost of ownership and operation is top of mind. Enterprise IT teams will often consider the most readily available solutions at lower costs before moving on to more complex and costly solutions. For all cases, switching from one wireless mode to another requires significant cost analysis to demonstrate improved bottom lines.

### Mining example

Companies looking at deploying private cellular and private 5G networks, focus on the challenges outlined above. Mining has been using 4G LTE technology for several years, there are many lessons to be learned from past experiences of these deployments.

The mining vertical is one of the early adopters of private 4G LTE. Communication in remote mining venues, need for automation and worker safety in isolated and dangerous terrain, as well as lack of reliable carrier-based cellular coverage has promoted mine operators to build and operate their own 4G LTE networks.

Going forward, modernisation and digitisation of the mining vertical is putting additional demands on these early 4G LTE networks and promoting them to expand and evolve to accommodate additional functionality. For any mine operator primary goals of deploying a communication solution can be summarised in the following:

- prevent failures/breakdowns/unplanned downtime
- enhance worker safety
- improve efficiency
- reduce energy consumption
- meet environmental requirements.

Mining sites are usually located in isolated geographic areas where spectrum coverage by cellular providers is limited or non-existent. Sites can include massive areas of undulating terrain that may be constantly changing due to excavation and rock removal activities. Venues can be over ground or underground. Underground mine shafts can be extensive and deep with unusual environmental characteristics that may cause wireless spectrum to behave differently.



Communication services using Wi-Fi mesh or 4G LTE platforms have been in use in mining sites for many years. These are usually simple standalone platforms that enable basic services for connectivity, worker safety, automation of haulage or drilling equipment, and monitoring of site and activities for security purposes.

Demand for more and better wireless has increased by orders of magnitude with the evolution of the mining industry. Specific use cases can include:

- innovative worker wearables and tools, beyond existing push-to-talk (PTT), to enable more intelligent monitoring and hands-free richer interactions of workers remotely. Wearables may be sensors located on hard hats, body cams and remote expert goggles. These devices need to be ruggedised and functional in hard-to-reach places such as mine shafts;
- extensive use of environmental sensors to ensure early detection of dangerous chemicals for both safety reasons as well as conformance to emerging environmental protection requirements;
- fleet management solutions for task scheduling and routing of haulage vehicles;
- automated haulage solutions and automated drilling solutions;
- massive live video and light detection and ranging surveillance via either static or using drones, combined with other venue surveillance for security and safety purposes is top of mind in mining, as well;
- general connectivity in changing terrains: eg, mine shafts, mine pits, wireless set-ups need to be able to change and adapt to these topographical changes.

In addition to the benefits, there are also certain considerations regarding the use of 5G networks in mines, which can include:

- spectrum sources for mines have been either private or leased carrier spectrum. Any outage at the mine can result in mas-



THESE EARLY DISCUSSIONS WITH ENTERPRISES ARE HELPING PAVE THE WAY FOR UNDERSTANDING POTENTIAL REQUIREMENTS; HOWEVER, ONE SHOULD NOT LOOK AT THESE DISCUSSIONS AS A FINAL STATE.

sive revenue loss or decreased worker safety. As such mine operators prefer to have full control of their spectrum and radio sources to prevent outage;

- other spectral considerations can relate to how spectrum behaves in different mine locations, such as a mine shaft where higher frequency spectrum does not propagate very well due to weaker reflection capability. For all use cases, a complete RF analysis of mine site and venues is necessary to assess effective spectrum performance and outcomes and ongoing RF analysis and expertise may need to be applied due to the changing terrain of a mine site;
- mining venues will tend to cost optimise for all needs, as with other legacy venues such as oil and gas. Any 5G equipment and solution will have to prove its value for enabling overall cost saving. Existing Wi-Fi mesh and 4G LTE solutions are just being deployed and put to trial. It is not clear how much cost saving 5G will bring;
- the choice of a privately operated network versus a managed service through a carrier operated network is a question, as with other verticals. So far, large complex mining operators have chosen expert IT and network operations firms who are very familiar with nuances of the mining vertical to set up and operate private networks for the mines while smaller and simpler mining sites have used carrier services;
- lack of approved hardened 5G hardware for mining venues. 5G adapters or industrial routers with 5G adapters will need to be ruggedised and integrated into AHS

and ADS, and these systems will then need to be tested for performance and reliability in specific mine venues.

### Summary of findings and recommendations

Perhaps the most important conclusion that can be drawn from considerations of 5G and 4G LTE in private cellular contexts is that there remains a great deal of innovation to be considered and expected as 5G rolls out and becomes more effectively available. 4G enabled a set of capabilities that were not imaginable earlier, 5G too will be enabling a set of capabilities that may not be imaginable today but are coming.

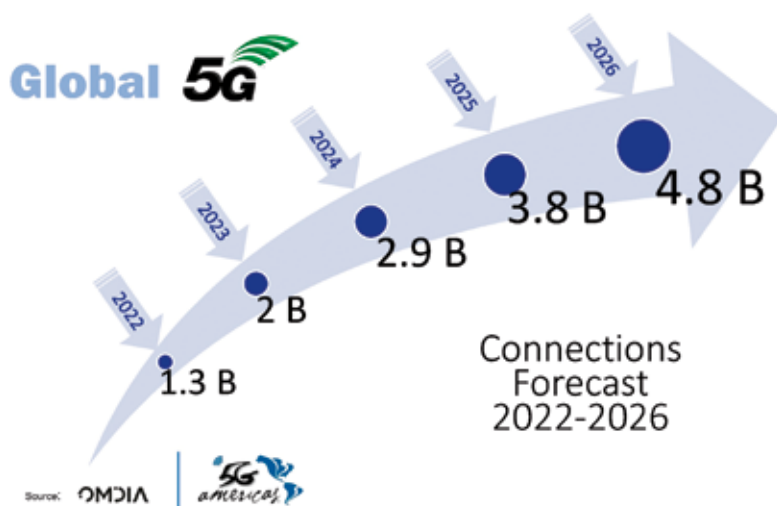
These early discussions with enterprises are helping pave the way for understanding potential requirements; however, one should not look at these discussions as a final state. All venues and use cases are evolving in several directions, with many possible combinations.

As we gaze at the horizon of possibilities, we should all agree to stay open to change and embrace new solutions. Directions that are becoming clear include: virtualisation and disaggregation of all network components, including the radio networks, movement of application to clouds of all shapes and forms (private, public, hybrid), emergence of new modes of human interaction a la wearables and applications such as AR/VR, automation at a scale that was not possible before, more machine intelligence at venues that we may not have ever considered, flexible hybrid service offers provided in part by a private network and parts by a public provider, and other unforeseen application combinations.

The possibilities are endless. The only firm, unchanging set of requirements are for a solid foundation of security and data sovereignty, as well as an acceptable cost-to-benefit ratio for all. The 5G wireless ecosystem continues to progress as this next generation of innovation continues to address new use cases, applications and vertical markets.

*5G Americas is an industry trade organisation composed of leading telecommunications service providers and manufacturers in the Americas. The mission is to advocate for and foster the advancement and full capabilities of LTE wireless technologies and the evolution to 5G.*

5G Americas  
<https://www.5gamericas.org/>





# 5G Connectivity

## Taking Peplink Technologies to the Next Level



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supports Gigabit LTE. For future technologies, the MBX features a swappable cellular module, so when you need to upgrade to 5G, you can simply swap your old one with a new one. The MBX is also capable of 2.5Gbps of throughput, giving you plenty of bandwidth for Gigabit Ethernet, 5G, or any future mobile technologies.



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Hot Failover maintains secure tunnels over all available WAN links to keep the network up and running when a connection drops out. If a WAN link fails, SpeedFusion instantly routes traffic to a working tunnel for uninterrupted VoIP sessions.



SpeedFusion is carrier agnostic and our products are certified with multiple carriers. By combining the coverage network of several mobile carriers, chances of running into a network blindspot or congestion is minimized.



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Unit 1, 63-79 Parramatta Road  
Silverwater NSW 2128



## 5G ON THE RADAR AT COMMS CONNECT IN MARCH

The 2022 Comms Connect Melbourne conference program will deliver information and insight into the possibilities and opportunities that 5G technology will bring to the critical communications and public safety sector in the months and years ahead.

Verizon's Robert Le Busque will share the lessons learnt from that organisation's deployment of a private 5G industrial network for the Port of Southampton in the United Kingdom.

Closer to home, ACMA has been busy facilitating a variety of licence types in the 26 GHz and 28 GHz bands (mmWave) for the deployment of 5G technology.

The conference program will also feature the federal government's 5G Innovation Initiative, outlined by Dr Jason Ashurst, Assistant Secretary in the Australian Government Department of Infrastructure, Transport, Regional Development and Communications. This session will focus on companies that have so far received funding on this program, and cover the reasons behind the government investment in 5G.

Azure Space's country lead, Lynn McDonald, will discuss how space-enabled tech is set to drive 5G innovation both locally and globally in her day two keynote presentation. Whether it is using the tremendous communications capacity that space provides or leveraging rich geospatial data, space-enabled tech is set to be at the forefront of comms innovation now and into the future.

These are just three of the 40+ sessions that will feature on the Comms Connect Melbourne conference program in March. See the full program here.

Early Bird discounts are available until 17 December and offer up to 25% in savings.



## Wi-Fi 6 USB 3.0 adapter and mesh router

D-Link has launched the DWA-X1850 AX1800 Wi-Fi 6 USB 3.0 adapter along with the DIR-X3260 AX3200 Wi-Fi 6 mesh router to power the number of high-bandwidth devices and support high-intensity data traffic for remote workers, students and families.

The DWA-X1850 is a slim and compact wireless adapter that plugs into any USB port and provides instant connectivity to a laptop or PC. It delivers Wi-Fi 6 performance for existing desktop and notebook computers. Featuring the latest 802.11ax Wi-Fi 6 technology, it delivers combined speeds up to 574 Mbps + 1200 Mbps, for large file transfers. The adapter also features 128-bit WPA3 encryption giving security over network and device protection.

Its multi-user or MU-MIMO technology provides upstream and downstream transmission and orthogonal frequency division multiple access where small data packets destined for multiple devices are transmitted together and never have to queue up again. Installation is simple and the dongle can also easily be carried around when out and about.

The DIR-X3260 EXO AX AX3200 Wi-Fi 6 mesh router provides 2400 Mbps on the 5 GHz and 800 Mbps on the 2.4 GHz band, for applications such as high-quality videoconferencing, VR, 8K video streaming and more. The durable 1024-QAM boosts throughput to devices by up to 25% and its 160 MHz contiguous channel width supports a larger number of devices.

Wi-Fi mesh technology provides simple syncing with compatible D-Link mesh extenders. As a result, users can roam seamlessly around their home on a mobile device without fearing signal degradation or a dropped connection. Firmware upgrades are automated, and in the unlikely event an upgrade fails, the system retains the pre-existing configuration.

**D-Link Australia Pty Ltd**

[www.dlink.com.au](http://www.dlink.com.au)

## Microwave indoor/outdoor backhaul

Nokia has introduced additions to its Wavence product portfolio with a range of indoor and outdoor backhaul solutions targeting mobile operators and mission-critical service providers. The new products cover all use cases including short-haul, long-haul, E-Band and SDN, offering a scalable, high-capacity solution.

Wavence MSS-XE is a scalable, compact indoor split mount solution that addresses high-capacity coverage requirements. MSS-XE's small size supports a range of installation and deployment scenarios as well as indoor rack space constraints. It hosts seven 10 gigabit ethernet and four 1 gigabit ports for good flexibility, scalability and capacity.

It has low power consumption and can handle a temperature range spanning -40 to 65°C. MSS-XE also provides an edge aggregation capability for both rural and suburban scenarios.

An enhanced edition of the Nokia UBT-T XP dual-carrier radio has also been released with a dual-band option for the spectrum bands 6 and 11 GHz.

Nokia has also introduced a Simplified RAN Transport (SRT) solution that complements the RAN with additional transport capabilities by leveraging the existing BTS transport resources and RAN management architecture. This delivers end-to-end service management and automation from RAN to core throughout the whole transport network.

**Nokia Solutions and Networks Singapore Pte Ltd**

[www.nokia.com](http://www.nokia.com)



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## PRIVATE WIRELESS NETWORK ADOPTED AT FINLAND MINING OPERATIONS

Nokia is working with Finnish mobile operator Telia and its partner, Digita, to deliver a 5G standalone (SA) private wireless network for Agnico Eagle Finland Oy. The company operates the Kittilä mine in northern Finland and the network will support Industry 4.0 use cases at the mine to accelerate its digital transformation.

The Kittilä mine is the largest primary gold producer in Europe and is located 900 km north of Helsinki and 150 km north of the Arctic circle, in the Lapland region of northern Finland. The network will support both above- and below-ground operations, reaching depths of up to 1 km. It will cover an extensive tunnel system to connect people, equipment, sensors, devices and vehicles leveraging the low-latency capabilities of 5G.

The Kittilä mine will benefit from real-time data processing at the network edge, supporting autonomous vehicles, high-precision positioning and group communications, to further enhance operational reliability, safety and quality.

The Nokia 5G SA private wireless network, based on the Nokia Modular Private Wireless solution, will incorporate Nokia 5G RAN AirScale base station technology and critical edge computing capabilities, together with the Nokia Compact Mobility Unit-based 5G core. The network will be deployed in phases and is expected to be completed in October 2022.

## Body worn camera

Hytera's latest body worn camera (BWC), the VM750D, is designed to capture, store and upload evidence such as pictures, video and audio recorded in the field. BWCs can play a vital role in building trust with the public by promoting better police officer accountability and by enhancing the transparency of incidents involving police and citizens.



The camera serves as a push-to-talk over cellular (PoC) two-way radio operating over 3G, 4G or WLAN networks. The BWC has two 1.5 W speakers to deliver clear audio during the call. It can also be paired with a narrowband two-way radio to act as a remote speaker microphone (RSM). After connecting the BWC to a radio via Bluetooth or a data cable, users can make voice calls by pressing the oversized PTT key. This helps reduce the burden on the user, as they do not have to carry another RSM.

The wide-angle camera allows users to capture more objects in a broader scope. Even at a distance of 1 m away, the VM750D can capture a person's hand actions. The camera incorporates the multifunctional sensor that will automatically send an alarm to the control centre in case the camera is blocked, stays still beyond preset time, is disassembled without authorisation or the officer lies on the ground. This allows the dispatcher to know the conditions of the BWC in the field.

The unit supports global positioning configurations such as GPS, GLONASS, AGPS and indoor Bluetooth positioning. This means that even in places with poor signal availability, such as parking lots, tunnels, underground shopping malls and the like, it can still track the location of frontline personnel in real time. This capability can help end users complete tasks more conveniently and efficiently.

**Hytera Communications Co. Ltd**

[www.hytera.com.au](http://www.hytera.com.au)

## Leaky feeder power supply

The Helios Power Systems AMP-K4310 Leaky Feeder Power Supply is a battery-backed, convection-cooled (no fans) power supply designed for harsh underground mining applications.



With an input of 180–300 VAC, the unit is capable of handling transient spikes; it is designed to provide 30 VDC (other options also available) for the leaky feeder and a separate output for battery charging (24, 48 or 110 VDC backup batteries). Can also be suited for lithium batteries.

Designed in a 2RU rackmount enclosure, it features: battery circuit breakers, meters, remote monitoring via TCP/IP, active relays to turn loads on/off, email alerts and high operating temperature.

**Helios Power Solutions**

[www.heliosps.com.au](http://www.heliosps.com.au)





NEW



## DAMM Service Box SB422

A powerful service box for complete base station functionality

The compact, flexible DAMM Service Box SB422 is designed to ensure full functionality of up to two DAMM MultiTech Outdoor Base Stations BS422. It includes a power supply, a PC and an ethernet switch and allows connection of an external backup battery.

The SB422 is fully backwards compatible with the DAMM Service Box SB421. Additionally the SB422 and the SB421 can be used together on the same node.

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- Easy installation and maintenance
- Maximum resilience and capacity
- Optional redundancy

For more information please contact:  
[info@damm-aus.com.au](mailto:info@damm-aus.com.au)



[WWW.DAMM-AUS.COM.AU](http://WWW.DAMM-AUS.COM.AU)

Critical communication made easy





*EOS demonstration vehicles. Third from right EOS demonstration vehicle with CBG Systems HF antenna and EM Solutions Taipan Satcom-on-the-move antenna.*

## C4 EDGE SHOWCASES DEFENCE MILESTONE

The Australian Army-sponsored sovereign industry initiative — Command, Control, Communications and Computers – Evolutionary Digital Ground Environment (aka C4 EDGE) — recently achieved a battlegroup and below prototype demonstration milestone at Majura Field Firing Training Range, ACT.

The sovereign Battlegroup and Below Battlefield Command System prototype was demonstrated in a combat team environment, integrating mounted/dismounted and uninhabited platforms in a single network. Matthew Jones, CEO of EOS Defence Systems Australia, said, “C4 EDGE incorporates locally sourced combat radios, satellite terminals, cryptography, networking middleware, command applications, user interfaces, batteries and power management into a coherent and fully Australian-controlled system.”

The initial success of C4 EDGE would not have happened without the sponsorship and extensive support from the Australian Army. Army Head of Land Capability Major-General Simon Stuart said C4 EDGE is an example of strategic partnership between army and industry characterised by engagement earlier in the Capability Life Cycle: “The initiative is a \$35m mobile tactical communications capability proof-of-concept involving a consortium of 18 Australian companies, led by Electro Optic Systems.”

Critical communications companies involved in the C4 EDGE group include: Barrett Communications, CBG Systems, Codan Communications, Electro-Optic Systems, EM Solutions, Etherstack, GME, Insitec and Solinnov.

## Indoor/outdoor team location app

Sepura has added to its portfolio of its AppSPACE applications for mission-critical organisations with SmartView, an application that allows team leaders to get a real-time view of the team's indoor or outdoor location.

The application will provide operational assistance to organisations operating complex sites such as airports, utilities plants and sports stadiums, as well as those working in public safety.

The application uses GPS positioning to visualise outdoor positions, then supplements this by reporting the indoor location using either Bluetooth beacons or from Wi-Fi access points. By combining both technologies in an efficient solution, SmartView enables team leaders to instantly see where their staff are located and how they can best be deployed to respond to everyday tasks or emergency situations.

The application can be deployed in sites with complex infrastructure such as airports, underground mining facilities or chemical processing plants, where staff may be working in underground tunnels or car parks, maintenance facilities or emergency rooms out of reach of a GPS signal. By using SmartView, these workers could still quickly be located in an emergency or efficiently redeployed based on changing resource requirements.

SmartView can also be used to improve staff safety, eg, by limiting access to restricted areas such as secure rooms, or ensuring that part of a site is clear, eg, a blast zone within a mining site.

The SmartView application benefits from software integration options, allowing organisations to install a full turnkey system or, for example, just integrate SmartView's Indoor Location capability with an existing third-party GPS location and mapping system. Deployment costs are further minimised by utilising low-energy and low-maintenance Bluetooth beacons that require no wiring and can be installed within minutes.

**Sepura**

[www.seapura.com](http://www.seapura.com)



## 2-in-1 tablet

Zebra's ET80/ET85 rugged 2-in-1 tablets are designed for use in public safety, utilities, critical field service and manufacturing.

They feature a thin, flexible design with a friction-hinged keyboard, optional built-in barcode scanner for data capture and a touch screen usable with glove and wet modes. They are rugged tested to military standard (MIL-STD-810H) and are drop, dust and waterproof. They also have IP65 certification (with ports open) and feature a fanless design to avoid spreading contaminants.

They support 5G, 4G networks and Wi-Fi 6E for the fastest WLAN access. Furthermore, they contain an Intel 11th generation CPU, 3 USB ports and an expansion connector, and 3 antenna passthroughs for strong GPS and wireless signals.

They come with a range of software, including push-to-talk and battery management applications to improve productivity, and accessories including shoulder and hand straps, extendable hard handle and auxiliary batteries with hot-swap capabilities.

They also offer a universal docking solution that offers 9 additional ports, and customisable security features including facial recognition, fingerprint reading and insertable CAC readers.

**Zebra Technologies**

[www.zebra.com](http://www.zebra.com)





## Hytera's H Series of next generation digital radios and repeaters

**H**ytera has released its H Series range of digital mobile radios, which answer the increasingly-complex communication challenges

posed by public safety, energy, transportation, utilities and other commercial industries.

Going back to the basics, Hytera engineers and designers have re-imagined the hardware platform and software architecture to further improve performance and user experience.

From audio engineers redefining noise cancellation algorithm software to improve voice audio clarity, through industrial designers redefining what professional radio users require in the handling of a radio, to structural engineers ensuring each unit withstands the rigours of whatever situation and conditions it is tasked to perform, the performance of each Hytera H Series radio optimises the user experience while being practical and easy to operate.

There are two handheld models in each H series handheld plus an H Series mobile radio. Each radio is more compact, lighter and delivers increased battery capacity and battery life.

Other innovations include using the vibration of the speaker to expel water through a specially designed cavity to ensure clear audio even in pouring rain. Direct mode communication range is extended by 25 per cent in open environments, while signal quality is improved at the edge of the network when in trunking mode.

Raising an alarm triggers top priority to other radios with a pre-programmed emergency mode, identifying the person issuing the alarm. A 'man down' feature will let others know if the radio has been tilted past a certain angle. This may happen for instance if the radio user has fallen over or is unconscious or injured. The alarm will be triggered after a warning is issued to the user.

Each radio is GPS-enabled and has Bluetooth wireless connectivity to audio devices to improve user experience.

The HP6 series has two models, the HP682 and HP602, specifically designed for business-critical users. While small and light and easily-pocketed, each model packs 20 hours of lithium polymer battery life in its IP67 waterproof casing built to military specifications.

The HP7 Series comprises of the HP782 and the HP702 radios built to slightly more robust specification than the HP6 Series. Still relatively compact and light they each have higher milspec and waterproofing capability with a full 24 hour battery life. These radios are made for the tough industrial environment.

The HM782 mobile radio delivers similar performance enhancements as the portable terminals. The addition of an Ethernet port allows the radio to function as a gateway for narrowband networking, while also making it much easier to co-operate with outside third-parties and platforms.

Features include six programmable keys for customised operation, a five centimetre screen with

a simple user interface and an accessory port and Ethernet port.

An improved case design greatly enhances heat dissipation for use in hot and humid environments. The HM782 is also Hytera's first DMR that can support the IP Transit Solution feature.

The head-mounting supports flexible deployment options to suit different environments and deployments, such as vehicles, motorcycles or fixed control rooms. It sports a standard single control head and remote control head (single or dual) to suit different environments, delivering efficient, flexible communication options.

Finally, the HR1062 compact digital repeater completes the Hytera H Series line up. Reduced to half the size of the previous Hytera model, the repeater includes a telephone gateway, a router and a power adapter in its compact footprint.

It also features an internal AC power supply with DC battery back-up, an Ethernet port for access to IP networks, improved receiver sensitivity and comes with a 64 channel capacity.

For further information about the Hytera H Series of next generation DMR terminals: Hytera H Series



**Hytera Communications Co. Ltd**  
[www.hytera.com.au](http://www.hytera.com.au)

# Industry Talking

Welcome to 2022; we hope you had/are having a relaxing festive season with family. A chance to catch up after such a long year is always welcome.

ARCIA finished off 2021 with an online celebration to recognise members nominated for regular awards. The association congratulates all the winners:

- Professional Sales award – Adam Burrridge
- Engineering Elegance – Mick Hughes
- Technical Excellence – Phill Rogers
- Customer Service – Andrew Bradfield
- New talent – Brendan Spano
- Apprentices – Thomas Gangi & Toby Maughan

2022 begins with our annual planning day in early February. While online meetings are fine, you really cannot beat face-to-face collaboration and this year it will be Sydney's turn to host the event. We have a lot to get started on in 2022 including the learning management system, two Melbourne events and other state get-togethers.

In March we will all gather in Melbourne for Comms Connect and the delayed 2021 annual gala dinner. During this event we will recognise the 2021 Peter Wallace and Johnathon Livingstone Seagull awards. We are also planning a celebration of our industry so we are really hoping that COVID will be clear and many of us can join the celebrations.

Following this busy first quarter the committee will be planning the rest of 2022 and a series of events around the country.

A huge effort will be required by the committee and many members and partners to kick our new learning management system into action, starting with simple courses and, over time, more challenging technical content. The system will become a key tool that provides value to members.

The benefits for people coming into the industry or indeed for long-term participants will be long-lasting. It is not just technical members either; the lunchtime learning sessions conducted in 2021 had numerous participants in administration, customer service and sales roles. In total, from the first five lunchtime learning sessions, we had 196 individual log-ins, with many being involved in more than one session and often with multiple people sitting around as a group for the experience.

During 2021, ARCIA participated with the ACMA and the ACCC on the market need for private LTE. Our view remains that private networks of various technologies will always be needed and therefore it is incumbent on regulators to provide spectrum for this purpose.

Spectrum is about the productivity of the nation. With evidence growing every day of the success of new spectrum mechanisms such as CBRS in the United States, ARCIA continues to advocate for these measures in Australia. The ACMA will be conducting some market research during the coming months on the Private LTE issues and we encourage as many industry personnel and companies to be involved in this important research exercise. It should be part of our future.

Finally, we hope that 2022 is the recovery year for Australia and, of course, our industry. As always we welcome membership input that can lift the industry.



*Hamish Duff, President,  
Australian Radio Communica-  
tions Industry Association*



## Broadband vehicle device

Sepura launched its first mission-critical LTE solution at Critical Communications World in Madrid. The SCU3 broadband vehicle device has been designed for use in vehicles and/or fixed office locations and supports mission-critical voice (MCPTT), video (MCVideo) and data (MCData) features.

Built on the Android operating system, the device provides compatibility with a wide range of applications, which have been designed to run on existing Android smartphones and tablets.

It features an optional TETRA modem, enabling narrowband voice and data services while also supporting Bluetooth, Wi-Fi and ethernet, providing connections to a range of accessories and ancillary systems.

In combination with the Sepura accessory hub (SAH3), the SCU3 can be connected to a wide range of Sepura and third-party accessories, providing flexibility for vehicle and fixed installations, including a vehicle control unit, which gives the user complete control with ergonomic buttons designed to enable safe, error-free use in vehicles that may be moving at speed. The option to reuse existing Sepura accessories means the cost of ownership is minimised and training requirements are significantly lowered.

### **Sepura**

[www.seapura.com](http://www.seapura.com)





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# SPACE INNOVATION WILL BE A COMMS CONNECT KEYNOTE

## HOW THE SPACE INDUSTRY CAN TRANSFORM THE CRITICAL COMMUNICATIONS MARKET

*Phillip Ross, Editor, [pross@wfmedia.com.au](mailto:pross@wfmedia.com.au)*

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Microsoft Azure Lead will present how working in partnerships makes innovation bigger and better.

**T**here is no doubt the digital transformation of communications and data is a massive growth area across all industries.

At the next Comms Connect in Melbourne, in March of next year, the Microsoft Azure Space Lead for Australia, Lynn McDonald, will discuss how space technologies and digital transformation are changing the way industries connect and operate, and how innovation is fundamental to these changes.

Lynn's keynote presentation on Thursday, March 10, will be titled: 'The new frontier: how space-enabled technology will drive critical comms and 5G innovation.'

"I'm focused on building breadth in capability through partnerships and depth through innovation," McDonald said. Collection of data is the easy part; the challenge is in managing and analysing that data and rapidly putting that value-add output into practice.

With space-enabled technology and connectivity, data and communications can be rapidly accessed from large geographic regions. It's then imperative to quickly draw out the business or operational value from this incredibly rich data through advanced analytics, like machine learning and artificial intelligence, and get these insights to end users and customers. The use of satellite technology for ubiquitous connectivity and access to unique datasets is ripe for innovation in business and operational applications.

Microsoft Azure Space is working with partners in Australia to innovate and deliver on these capabilities. One of these partners is Nokia. Microsoft and Nokia are partnering to bring Space and 5G technologies together to deliver high-capacity, low-latency connectivity and compute to the edge, with remote capabilities for customers in sectors like defence, mining and agriculture.

"The evolution of technology in hi-tech industries like space is intense and exciting" McDonald said. "With this evolution, there is a huge appetite for rapid innovation to bring new ideas and capabilities to market. To keep pace, a company's culture needs to support a 'fail fast' approach to innovation, where people are empowered to try, fail, learn and grow — and do it fast."

Eminently qualified to present the Comms Connect keynote, Lynn has 25 years of space expertise in defence, the intelligence community and industry. She retired as a Colonel from the US Air Force in 2019 and joined Microsoft in 2020 to help initiate their efforts in the space industry.

McDonald has experience in satellite operations, space launch, operational test for space programs like GPS, space-based intelligence and cloud capabilities for space missions. She has held several military command positions leading large operational space organisations with complex satellite missions.

With that history and knowledge, Lynn understands the need for innovation to keep pace with the market.

## AT A GLANCE

**What:** Comms Connect Melbourne

**When:** 8–10 March 2022

**Where:** Melbourne Convention & Exhibition Centre

*Check out the full speaker line-up at*

<https://melbourne.comms-connect.com.au/speakers>

## Comms Connect Melbourne

The 2022 Comms Connect Melbourne conference will be held at the Melbourne Convention and Exhibition Centre on 8–10 March 2022.

Day one on 8 March will feature four technical half-day training workshops before the conference starts on 9 March.

Two conference streams will run on the following two days. Each day will begin in the main auditorium with the welcome address, followed by keynote sessions before splitting into the two streams.

The program will include information and insight into the possibilities and opportunities that 5G technology will bring to the critical communications and public safety sector in the months and years ahead. Verizon's Robert Le Busque will share the lessons learnt from that organisation's deployment of a private 5G industrial network for the Port of Southampton in the United Kingdom. Closer to home, ACMA has been busy facilitating a variety of licence types in the 26 GHz and 28 GHz bands (mmWave) for the deployment of 5G technology.

The conference program will also feature the federal government's 5G Innovation Initiative, outlined by Dr Jason Ashurst, Assistant Secretary in the Australian Government Department of Infrastructure, Transport, Regional Development and Communications. This session will focus on companies that have so far received funding on this program and cover the reasons behind the government investment in 5G.

Azure Space's country lead, Lynn McDonald, will discuss how space-enabled tech is set to drive 5G innovation both locally and globally in her day two keynote presentation. Whether it is using the tremendous communications capacity that space provides or leveraging rich geospatial data, space-enabled tech is set to be at the forefront of comms innovation now and into the future.

These are just some of the 40+ sessions that will feature on the Comms Connect Melbourne conference program in March.

As the number one event for the critical communications industry in the region, the exhibition will run each day.



*Lynn McDonald, Microsoft Azure Space Lead for Australia.*



## NSW EMERGENCY OPERATIONS CENTRE OPENED

A new telecommunications operations centre to support critical communications during bushfires or floods has been opened by the New South Wales Minister for Digital and Customer Service Victor Dominello.

The Sydney-based centre would give the NSW Telco Authority's Telecommunications Emergency Management Unit (TEMU) real-time information on potential impacts to telecommunications infrastructure for emergency services organisations. By tracking the likes of severe weather in real time with the telco authority, the centre will be able to update first responders and telecommunication carriers with accurate information on the location of critical infrastructure that might need protecting.

The centre will be managed by the telco authority's TEMU team and will be used to monitor, gather information, analyse data and geospatial mapping by utilising the Joint Intelligence Management System (JIMS). JIMS will enable real-time identification of risks to telecommunications infrastructure within NSW and across neighbouring states.

The operations centre provides critical support during an emergency as well as offering facilitation capabilities for long-term operations requiring significant coordination between multiple agencies, such as the COVID-19 pandemic.

## Remote video streaming solution

Speedcast has launched SmartView, a remote video and audio communications solution designed for energy, maritime, enterprise, telecommunications and government customers. Industries with critical operations can accelerate their digital transformation for remote access and field collaboration.

Powered by Speedcast partner Harvest Technology's ultra-low bandwidth network optimised livestreaming solution, Speedcast SmartView allows secure, high-definition video and audio to be

streamed in real time via satellite at a fraction of the bandwidth previously required. Organisations looking to move to digitalisation can use SmartView to conduct inspections and repairs for assets operating anywhere in the world, without requiring technicians to travel and work at remote sites.

Available in multiple formats, Speedcast SmartView can be used on remotely operated vehicles (ROVs) for subsea inspections and research, at remote sites for monitoring, and on wearable devices.

### Speedcast

[www.speedcast.com](http://www.speedcast.com)



## Radio solutions for emergency services and defence communication

Amber Technology is able to provide the StreamCaster solutions for emergency services and defence communication requirements from Silvus Technologies. The range enables critical mobile communication and temporary network requirements for projects on land, at sea and in the air.

The SL4210 compact, narrowband radio is designed for applications where smaller size and lower operating bandwidths are required. The SL4210 is available in S-band and C-band versions.

Representing the latest in GaN power devices, the Silvus SC42x0EP and SC44x0E radios are capable of producing up to 20 W total output power for the SC44x0 and 10 W for the SC42x0. This will increase range, provide more robust links to support advanced data rates and increase penetration in challenging urban and dense vegetation environments such as forests and jungles.

Narrowband (1.25/2.5 MHz) operating modes for SC series radios are now available as a licensed feature. This supports applications when bandwidths are not available, not approved or not suitable for optimal performance. Wideband (10/20 MHz) operating modes for SL series radios are available to support applications for wider bandwidth requirements to increase the network throughput and to interface at higher bandwidths with networks equipped with SC radios.

The mobile ad hoc network spectrum monitoring (MAN-SM) enables continuous, real-time monitoring on eight pre-selected channels across the network. Now available on SC4200EP and SC4400E radios, this feature means the optimal operating frequency can be easily selected to avoid impact to, or on, other wireless devices.

### Amber Technology Limited

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- ▶ Battery management features include state of charge, runtime remaining, equalization charging and battery discharge testing
- ▶ Up to 12 output load distribution with remote power cycling



## PLATINUM SERIES

- ▶ 800 or 1600 watts of output power
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- ▶ Network security protocols include HTTPS, TLS 1.2, and SNMPv1/2/3
- ▶ Optional battery backup with adjustable low voltage disconnect
- ▶ Battery management features include state of charge, runtime remaining, equalization charging and battery discharge testing



## DISTRIBUTION SERIES 3

- ▶ Supports 12, 24 and 48 volts DC applications
- ▶ Remote monitoring and power cycling of connected load devices
- ▶ Automatic load shedding of non-critical loads (user defined)
- ▶ E-mail alarm notifications
- ▶ Network security protocols include HTTPS, TLS 1.2 and SNMP v1/2/3



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## BUSHFIRE SPREAD PREDICTION MODEL KEEPS FIREFIGHTERS AHEAD

Australia's national science agency CSIRO and the NSW Rural Fire Service have released Australia's most advanced model for predicting the speed and behaviour of eucalypt forest fires, helping to save lives and property during bushfires. Eucalypts make up more than 70 per cent of Australia's forests, and some of Australia's most extreme fire events — such as the 2009 Black Saturday fires and the most severe of the 2019/20 bushfires — occurred in this type of vegetation.

The Vesta Mark 2 model, a mathematical description of how a fire responds to environmental conditions, will be rolled out nationally this summer and will help fire control rooms across the country to predict and suppress bushfires as they spread across the landscape, and to warn the public.

Data inputs such as forecast weather and wind information come from the Bureau of Meteorology, while information on the state of fuels within the forest and existing behaviour of a fire can come from vegetation databases and fireground reports. Fire behaviour analysts in an incident management team, often stationed at an operations centre near the fire, collate this information and then run the model to generate a prediction of the likely progression of the fire across the landscape.

The original 'Project Vesta' in the 1990s was the largest ever experimental program studying forest fire behaviour in Australia.



## Spectrum analyser

The Rohde & Schwarz SpectrumRider FPH is designed to suit both field and lab applications in indoor and outdoor environments. Most of the basic models have a unique frequency extension concept via keycode and the analyser supports a wide frequency range up to 44 GHz.

Large buttons and a multifunction rotary control allow operation even with gloves and the battery lasts an entire working day. The backlit keypad makes the analyser usable in the dark, and the bright non-reflecting display allows for readability in sunshine. An on-screen keyboard and many other functions make the life of the user easier.

The light weight and small form factor of the FPH allow it to be carried easily and the rugged design makes it a suitable companion even in harsh and difficult-to-reach environments.

Being fanless, the analyser operates noise-free and is clean and operates well since no dust or water can slip in through the vent guard.

With solid RF performance, a short boot time and overall ease of use, the SpectrumRider FPH is a useful instrument for spectrum measurements in the lab or in-service applications. It is suitable for use in various industries such as aerospace and defence, wireless communications, broadcasting, spectrum regulation and education.

**Rohde & Schwarz (Australia) Pty Ltd**

[www.rohde-schwarz.com.au](http://www.rohde-schwarz.com.au)

## Mission-critical radio

Motorola Solutions' newest radio for firefighters, the APX NEXT XN, is a mission-critical radio designed to meet stringent fire industry standards for use in hazard zones and conditions.

For use in hazard zones, including those related to heat exposure, immersion and drop/impact acceleration, it also meets requirements for software safety, including automated checks of battery capacity and accessory connections. Testing included heating devices to 260°C for five minutes and direct flame exposure for 10 s. It can be connected to Motorola Solutions' XVN500 remote speaker microphone, which is also designed for hazardous environments.

It combines mission-critical communications with broadband capabilities for applications that provide essential information to help firefighters respond to an emergency. The radio includes interactive maps with firefighter locations to coordinate response, multimedia messaging to share pictures and videos, and GPS location information that updates every few seconds to enhance safety for every firefighter. It also features ViQi voice control, which enables users to control their radio through simple and intuitive voice commands.

**Motorola Solutions Australia Pty Ltd**

[www.motorolasolutions.com.au](http://www.motorolasolutions.com.au)



# NSW Police working with Valen

**N**SW Police are responsible for multiple Radio Communication systems, including both remote off-grid and mains powered sites across NSW and reached out to Valen in 2016 looking for a better supply of batteries to support their Radio Communication systems.

## Scope/challenges

NSW Police have an extensive network of communication sites containing both mains powered and solar systems. Unfortunately, batteries in both site networks were failing prematurely, costing NSW Police valuable time and money in maintenance. This site downtime meant service restrictions and communications loss.

## Solution

Valen Partnered with NSW Police and utilised the range of Valen ENDUROGEL Front Terminal batteries across the NSW Police communication sites. The Valen ENDUROGEL Front Terminal's slimline design allows the battery to be retrofitted into 19-inch racking for a compact and effective battery system. Stringent quality-controlled manufacturing and in-house testing give the Valen ENDUROGEL Front Terminal Battery the ability to deliver a 15-year design life and the Front Terminal battery of choice in mission-critical cyclic applications. The ENDUROGEL battery was especially prevalent in applications where intense cycling or high temperatures were at play.

## ENDUROGEL

The Valen ENDUROGEL battery range features a rechargeable, deep cycle, Valve Regulated Lead Acid (VRLA) battery. Genuine Gel technology allows this battery range to offer the cyclic benefits of the Valen GEL range. However, the Valen ENDUROGEL battery also outshines the standard gel battery by incorporating both advanced lead plates and the Catalyst. High purity virgin lead plates with 1.6% tin extend the longevity of the Valen ENDUROGEL battery.

The inclusion of the unique Catalyst Life Extender substantially reduces sulphation, thermal runaway, delamination and battery dry out, all major killers of VRLA batteries. Furthermore, the Catalyst can provide a longer and greener life by recombining hydrogen and oxygen ions. This innovative combination makes the Valen ENDUROGEL battery the preferred choice for use in mission-critical cyclic applications, such as radio telecommunication sites, data centres, road



signage, rail communications, solar applications, mining and telemetry.

Maintenance-free design minimises technician time spent at site and on battery-related callouts. Thixotropic gelled electrolyte, genuine gel separators, quality lead plate and the Catalyst Life Extender allow the Valen ENDUROGEL range to offer a 12-year design life for the Mono Bloc and 15 years for the Front Terminal Batteries. The Valen ENDUROGEL range for mission-critical cyclic applications are FAA and IATA Approved safe for air transportation.

## Outcome

Valen saved NSW Police money by providing a battery that Valen could guarantee would exceed performance expectations. The Valen

ENDUROGEL saves NSW Police money over the total lifetime cost and reduces technician time on site. By solving this problem for NSW Police, Valen has become the supplier of choice when it comes to battery procurement and support. Contact the team today for more information on how Valen can help you with your next project.



**Valen Power Pty Ltd**  
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## MCX CONFORMANCE TESTING HITS TARGET

Funded by the US National Institute of Standards and Technology (NIST), the Mission Critical Services - Testing as a Service (MCS-TaaS) project has announced that 60% of mission-critical push-to-talk (MCPTT) conformance test cases have been formally verified. This is the trigger required by certification organisations to activate their MCX conformance certification programs to meet procurement requirements from mission-critical operators and users.

The certification program helps to establish a stable market for mission-critical services deployment and is essential to ensure that critical broadband devices and services conform to the 3GPP standards. Conformance testing is required to verify the correct operation of key interfaces between devices and between the device and the mobile network. Field trials are used to complement laboratory testing and witness the device and services behaviour in live multi-vendor commercial networks.

Test case verification is achieved using 3GPP's RAN5 Working Group's-defined MCX IPCAN model, the only accepted standards-based process for full verification of MCX test cases. 3GPP defined the MCPTT, MCDATA and MCVideo services ecosystem — known collectively as either MCS or MCX — and both the industry and end users have been calling for clear certification programs that use standardised conformance testing tools in order to accelerate trusted deployments.

3GPP's RAN5 Working Group works on the specification of conformance testing at the radio interface for the user equipment and defined the test cases to assess the mission-critical-related functionality.

Using ETSI's TTCN-3 language ensures the guidelines designed by 3GPP and certification bodies are followed. These compliance testing processes are widely adopted in the consumer mobile world and typically require the evaluation of the underlying LTE network and associated signalling. In order to adapt those requirements to the needs of mission-critical operators and users, the MCX IPCAN model was defined, resulting in significant additional complexity in the tester.

## Push-to-talk over cellular radio

Hytera has launched its latest push-to-talk over cellular (PoC) radio at CCW202: the PNC360S, designed to help business users communicate effortlessly and efficiently.

Traditional PoC radios suffer from a number of challenges, including unclear audio in noisy environments, intermittent voice call issues in areas with a weak signal, a short battery life and unstable performance in humid and dusty conditions. The Hytera PNC360S has been designed to deliver reliable PTT communications. The radio features a built-in 3 W speaker with a 36 mm diameter to ensure loud audio. The implementation of noise cancellation and patented distortion suppression technologies assists voice clarity. Plus, a feedback suppression algorithm stops feedback howling when radios are close together.

The PNC360S weighs only 170 g and is just 26.5 mm thick. The one-sided key layout allows the user to operate it with one hand. The over-sized PTT key helps the user locate it by touch alone, while an orange ring around it gives the user an extra visual cue, especially useful when operating in low light. The anti-slip texture surface can reduce the number of accidental drops even in moist conditions.

It is designed with a rugged structure, is constructed out of waterproof materials and is IP67-certified.

**Hytera Communications Co. Ltd**

[www.hytera.com.au](http://www.hytera.com.au)



## ARINC USB 3.0 interface

Metromatics has released a small, rugged cable assembly from Alta Data Technologies, the NLINE-UA429. It connects ARINC devices to notebooks, desktops and servers via USB 3.0 SuperSpeed. In addition to 4 or 8 channels of ARINC RX/TX message controls, it can generate or capture (o-scope) raw bus signals for protocol and electrical troubleshooting, and cybersecurity modelling.

The device provides the latest interconnect technology for ARINC buses, along with the widest selection of ARINC interface boards. All units are accompanied with the AltaAPI SDK and AltaView Windows analyser providing quick integration for ARINC applications. For most existing applications, the NLINE-UA429 can be used with little or no code changes.

With the release of Thunderbolt appliance TBOLT, providing PCI Express backplane performance for ARINC and 1553 connections, Alta Data tested the USB 3.0 SuperSpeed and was pleased with throughput rates available for most ARINC applications. Unit products provide ARINC and 1553 customers the convenience of USB without having to perform a 'program then run sequence' typical of USB 2.0 products.

The unit is suitable for both lab and deployed applications.

**Metromatics Pty Ltd**

[www.metromatics.com.au](http://www.metromatics.com.au)







# Icom IC-SAT100

Stay connected, with push-to-talk, one-to-many satellite communications

**W**hether you're working in a remote area where there is no communications infrastructure or need communications during an emergency or disaster where all the communications are down, the IC-SAT100 has your back. This satellite push-to-talk, one-to-many, handheld radio is born from a collaboration that combines Icom's over-60 years expertise and knowledge in the radio industry with Iridium's satellite experience, providing a professional radio communications solution that will enable you to communicate whenever you want and wherever you are in the world.

Satellite push-to-talk lets you stay connected, even in the most remote parts of Australia or the Pacific ... in fact, this is the only push-to-talk device that would enable someone standing on the South Pole, to speak with someone standing on the North Pole with the push of a button. It is truly global push-to-talk.

Using satellite push-to-talk, you can communicate with other IC-SAT100 radios assigned to the same Talk-Group. The coverage area of a Talk-Group is

selectable from five sizes. The smallest talk group covers 100,000 square kilometres. For perspective, Tasmania is about 64,000 km<sup>2</sup>. The largest talk group is 2.25 million km<sup>2</sup>, which is bigger than the state of Queensland.

The Iridium constellation consists of 75 satellites (66 of them are operational satellites and 9 are in-orbit spares) and is in low earth orbit, approximately 780 kilometres above the earth. Low earth orbit provides strong signals, fast connections and low latency through smaller antennas and has lower power requirements. Most other satellite networks use geostationary orbit, which is about 35,000 kilometres from our planet. Iridium's network uses L-Band frequencies, which are more resilient to weather than the frequencies used by most geostationary orbit networks, providing reliable communication even in adverse conditions, in the air, on the sea or on the ground.

In space, each satellite is cross-linked to four others, providing redundancy and advantages in reliability and resiliency.

The best part is that there is no infrastructure required. The IC-SAT100 is a perfect communication tool for governments, humanitarian and multinational organisations, energy exploration expeditions and adventurers. It suits any users that need communication in remote or isolated areas, or for emergency assistance where terrestrial communication infrastructure is damaged or does not exist. The IC-SAT100 is incredibly durable and reliable. It was built and tested to MIL Standard 810 and features IP67 waterproofing and dust protection. The supplied BP-300 lithium-ion battery pack provides 14 and a half hours of operation and the USB port allows for charging on the run. This radio has advanced encryption standard (or AES) 256-bit, providing extra security in communication. There is also a short-data message function, built-in Bluetooth, an integrated GNSS receiver, an SMA type antenna connector for an external antenna as well as an AquaQuake™ function that clears water from the speaker grill.

To get started, all you need to invest in is the radio terminals and airtime. Communication rates are typically charged at a flat rate through a monthly plan and carry no additional call charges. The fees differ depending on the coverage area or talk-groups. Icom have a comprehensive range of accessories available for the IC-SAT100, including speaker microphones, handsets and more.



*IC-SAT100 users can immediately start talking to all the radios in the same Talk Group, with just a push of the transmit button. This means that someone standing on the North Pole could talk to someone standing at the South Pole. There is no other two-way Push-To-Talk device that can do this.*



**ICOM**

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# HOW TECHNOLOGY CAN OVERCOME EMERGENCY SERVICE CHALLENGES

## EFFECTIVELY MONITORING DISPARATE NETWORKS

*Sean Newman, director and principal consultant, Kalibre and Matthew Bertram, business consultant, Micro Focus*



Modern applications can be used to bring together fault and performance data into a 'single-pane-of-glass' view of the overall network.

**M**ore than ever before, public safety network providers depend on technology that provides visibility into their network to ensure they can support mission-critical communications.

We have seen in the last few years the additional pressure that natural disasters such as bushfires and extreme weather events can place on these networks. Telecommunications outages can severely impact the critical communication required to coordinate resources and keep emergency services personnel safe.

A modern public safety communications network is incredibly complex and diverse, with a broad range of devices that need to be monitored alongside the radio network itself. This can include DC power systems, generators, batteries, air conditioners, microwave and other backhaul transmission equipment, plus now even cameras that provide security monitoring at remote locations.

To provide radio coverage where emergency services need it, service providers often need to build towers in remote and difficult-to-reach locations. These remote locations, coupled with the severe weather conditions faced there, can place additional strain on power supply and air-conditioning systems, impacting on the ability for these systems to continue functioning.

On top of this complexity, service providers are being asked to meet increasingly stringent and rigorous service levels from state and federal government customers

that demand high levels of network availability and performance. These service levels are backed by mandatory monitoring, measurement and reporting requirements to demonstrate compliance.

Against this backdrop, service providers face challenges in being able to effectively monitor these disparate network elements. Traditionally, the various devices and technologies are monitored with multiple discrete monitoring systems, resulting in a proliferation of screens and applications within the network operations centre (NOC). Couple this with the tendency for network devices to generate high volumes of alarms and the result is the NOC struggling to stay across the faults occurring within their networks. Fault diagnosis becomes very time-consuming, often requiring NOC operators and engineers to manually sift through an overwhelming volume of fault information to try and find the root cause.





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The good news for service providers is that technology that can assist with this difficult task. Modern applications can be used to bring together the fault and performance data from multiple disparate technologies and systems into a single-pane-of-glass view of the overall network. These systems provide broad and flexible integration options that can ingest and normalise data from across the diverse technologies deployed in these communications networks.

Correlation technology has revolutionised how radio networks are monitored by bringing multiple disparate data streams together and correlating them into meaningful, actionable faults. This drastically reduces the number of events that operators need to process, reducing the manual handling of events. This lets network operators see through the noise to the actual impact and root cause of network faults.

Automation technology can reduce the workload on NOC operators in escalating and actioning faults once they are detected. Faults can be automatically escalated to notification and service management systems, based on highly configurable business rules. This eliminates the 'swivel-chair management' tasks where operators need to manually enter fault tickets into separate systems for customer notifications and field technician workforce management.

Real-time service health monitoring technology lets network operators identify the real business impact of infrastructure faults as they occur. The faults are mapped to the impact they have on the services they provide to customers, which means the NOC can more effectively prioritise restoration efforts to those faults having the greatest impact on customers.

Mobile-responsive web-portal technology is used to extend network status and performance information to the actual users of the networks. Emergency services members can view the availability and load on the radio network where they are, whether accessed from desktops, laptops, tablets or smartphones.

Modern data visualisation techniques can be used to present meaningful data to users in a way that can be quickly digested and understood. This data visualisation technology can also be used by emergency service control centres to manage network load during major events. Real-time network usage data is presented to operators using advanced data analytics techniques for fast decision-making to ensure that congestion of the radio networks is minimised, allowing communications to continue flowing during crisis situations.

Where technology has improved access to and sharing of information, data governance becomes an important element of a modern monitoring technology solution. Secure access to data coupled with a flexible authorisation model is required to ensure that only the right people have access to the data, and only the data that is relevant to their operational needs. Authentication technology provides flexible options for authentication and authorisation, including both push and token-based multi-factor authentication, along with a role-based authorisation model that provides granular access to system data and functions.

Vertical and horizontal scaling technology allows monitoring solutions to grow in order to meet the changing needs of these public safety networks. As these networks grow from covering limited parts of the

country to encompassing entire states, the monitoring solution is also able to grow in size and capability to keep pace with service provider requirements.

As extreme weather conditions continue to be experienced across the country and around the world, effective and reliable emergency services communications will continue to be a vital part of the response. Technology also will continue to play a greater and greater role overcoming the challenges faced in managing these communications, for greater reliability and visibility of these networks.



*Matthew Bertram is the go-to-market business leader and solution specialist for Micro Focus Software-as-a-Service (SaaS) across Asia-Pacific and Japan. Matthew is responsible for enabling the sales and technical*

*team to sell SaaS solutions and the development of sales initiatives. He works collaboratively with product group leaders, sales management teams and SaaS delivery teams. Matthew has spent over 25 years working in IT and with enterprise software. His experience as a manager, change agent and solution consultant at Hewlett Packard Enterprise, HP, Mercury and Accenture has given him a comprehensive background in application delivery, project and portfolio management, IT operations, information governance, process improvement and sales. Matthew holds a Bachelor of Applied Science (Information Management) from Deakin University in Australia. He is married with two daughters and is based in Melbourne.*



*Sean Newman is a highly experienced consultant specialising in the analysis, design and deployment of operational and business intelligence solutions for customers ranging from small to medium enterprises*

*through to large corporate, government, public safety and telecommunications providers. Sean's experience in network and systems monitoring in the critical comms space spans 20 years, including Hewlett Packard, TUSC Computer Systems, Ucity and the last 13 years as one of the directors at Kalibre.*

Kalibre Pty Ltd  
www.kalibre.com.au

# Motorola Solutions delivers a safer community in Brazil



The Secretariat of Public Security and Social Defense (SEGUP) of Pará, Brazil, chose Motorola Solutions for its mission-critical communications to connect all public safety agencies across the country's second-largest state, Pará. The deployment is part of the 'Speaking for all Pará' initiative that is focused on equipping Pará's public safety and government agencies with Motorola Solutions' Apco P25 radio technologies to enable a fast, effective emergency response to reduce crime and better protect the region's eight million citizens.

Pará's diverse landscape, spanning more than 1.2 million kilometres, from populous cities to the remote and dense Amazon rainforest, presents challenges for emergency services that further highlight the criticality of reliable and trusted communications for frontline workers. Now, public safety agencies can rely on effective coverage, management and dispatch at mission-critical communications standards, whereas previously, their communications were limited to commercial networks.

Motorola Solutions' Apco P25 network is focused on making sure Pará's first responders and personnel are connected with secure and resilient communications across hundreds of kilometres statewide. The solution, which includes 2000 APX900 portable radios and 23 repeater stations, will enable critical

interoperability between the state's different agencies, including military and civil police, military firefighters, prison site services and traffic agents.

All integrated on one network, teams across agencies will be able to coordinate their everyday essential services, as well as quickly mobilise and scale to respond to large events.

"We have already reaped benefits in the first phase of the project with greater operability in our police actions benefiting the north and north-east regions of Pará and later we will have full coverage of the state," said Lieutenant Colonel Odiney Nogueira, head of the Information Technology and Telecommunications Directorate (Ditel).

"Integrated, clear and secure communications are essential to fight crime and keep communities safe, especially in a state as large as Pará where resources must be managed efficiently to provide services where they are needed most," said Elton Borgonovo, territory director, Motorola Solutions Brazil. "The State of Pará has a clear mission to protect its citizens and we're proud to work as their partner and deliver the technology to help make Pará a safer state."

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## NSW MARINE RESCUE GETS SOME NEW KIT

NSW Minister for Police and Emergency Services David Elliott welcomed a million-dollar boost for boating safety on the far north coast, with the delivery of a rescue boat and the fit-out of premises for the Marine Rescue Point Dangar unit.

Elliott was joined by MRNSW Commissioner Stacey Tannos, MRNSW Deputy Commissioner Operations Alex Barrell, MRNSW Deputy Commissioner Corporate Services Todd Andrews and Point Dangar volunteers to officially welcome Point Dangar 31, a 12.5-metre Naiad, to the MRNSW fleet.

The Minister also welcomed the announcement of a \$200,000 hi-tech fit-out of the Marine Rescue base. The fit-out will see a new antenna, VHF radios and radio equipment, emergency generator and office fittings; creating a space to coordinate emergency communication and response on local waterways.

Built by Yamba Welding & Engineering on the NSW north coast, the Point Dangar 31 is equipped with the latest search and rescue technology including radio direction finder, radar and side scan radar. The vessel also features a full first aid fit-out, including a defibrillator and oxygen kit.

## Signal chains development kit

Teledyne e2v has expanded the scope of engineering support accompanying its EV12AQ60x analog-to-digital converter (ADC) series. The EV12AQ600-FMC-EVM development kit is a tool for those implementing mixed-signal subsystems.



Intended for prototyping work relating to avionics, military, space, telecommunications, industrial and high energy physics applications, this kit may be used for evaluating the operation of the company's EV12AQ600 and EV12AQ605 12-bit quad-channel ADCs. It means that engineers can quickly construct functioning prototypes and check that the expected operational parameters can be achieved.

Each board features either an EV12AQ600 or an EV12AQ605 device, along with four single-ended signal inputs and an FMC connector for interfacing with an appropriate programmable logic device. In addition, a high-speed internal clock (supporting 6.4 GHz operation), a 12 V-rated power supply unit and an ESI-stream serial interface have also been incorporated, plus provision for the connection of an external clock and a temperature monitor.

The new development kit adds a further dimension to the existing portfolio of hardware based on the EV12AQ60x series. This also includes the previously introduced demo kit and the multi ADC synchronisation kit, both of which have built-in FPGAs. By the EV12AQ600-FMC-EVM allowing engineers to add their own relevant FPGA, consistent with what will be specified in their actual system, it is possible for them to begin creating the necessary code at the prototyping stage. This means that they don't have to start again from scratch after the prototyping work has been completed. The kit is compatible with a wide variety of FPGA plug-in boards from different vendors. By utilising the ESI-stream interface, there is the possibility for multiple kits to be synchronised together to assist with the development of more complex arrangements, such as phased-array antennas.

The integrated cross-point switch can be used to sample the cores of each EV12AQ600 and EV12AQ605 ADC independently of one another or interleaved together. This results in a 1.6 GSps sampling rate when in 4-channel mode, a 3.2 GSps rate in 2-channel mode or a 6.4 GSps rate across a single channel. The bit rate and the input analog bandwidth can also be adjusted as required.

**Teledyne e2v Asia Pacific Limited**  
[www.teledyne-e2v.com](http://www.teledyne-e2v.com)

## Private 4.9G/LTE network solution

Nokia has released its MulteFire Alliance certified 4.9G/LTE private wireless networking solution. It is designed to open up private wireless for mass adoption by specialist customers, applications and markets worldwide. The router 700 user equipment is available for deployment with Nokia Digital Automation Cloud for use with the Nokia DAC platform, enabling simple set-up of private wireless connectivity.

The private wireless solution is suitable for both permanent networking and temporary deployments in use cases such as sporting and cultural events, media broadcasting, construction sites, field hospitals and public emergencies.

It is an LTE-based technology that operates in unlicensed spectrum, including the global 5 GHz band. With deployment available globally, it can be used by customers currently without access to licensed spectrum, or bring additional capacity as a complementary layer to wireless networks.

**Nokia Solutions and Networks Singapore Pte Ltd**  
[www.nokia.com](http://www.nokia.com)



# Over-the-air testing of 5G millimeter-wave radios



After years of hype, the world is quickly being introduced to 5G. Country by country and provider by provider, this can mean different things. Much of the world is focusing initial 5G rollouts on the 3GPP defined FR1 bands (those carriers with frequencies below 6 GHz). The widest allotment of spectrum for FR1 5G is 100 MHz or less.

While this amount of bandwidth will provide much higher performance over legacy wireless standards, it isn't the best 5G can do. FR2 — or millimeter-wave (mmWave) — frequencies typically operate around 24, 28 or 39 GHz and can support single carriers up to 400 or 800 MHz channels made up of side-by-side aggregated carriers.

In addition to the practical differences between FR1 and FR2 signals, there are also technological differences that will impact performance and testing. Per the 3GPP standard, mmWave 5G NR signals have subcarrier spacing of either 120 or 240 kHz, compared to only 30 or 60 kHz for FR1. FR2 signals also have more SSB beams.

All 5G NR base stations transmit SSB beams through the antenna's transmission sector, but mmWave radios use between 12 and 64 beams, whereas FR1 radios are limited to 4 or 8 beams. With 64 beams, the radio can transmit narrower beams with more power, which improves the efficiency of the radio and helps avoid interference. However, more beams requires decoding more bits from the PBCH in order to read out all 64 beam indexes in their correct position. It also requires a greater number of antenna elements in the antenna array used for beam forming. This makes it

impossible to do connected testing and verification of the radios, forcing users to do all testing OTA. Finally, mmWave signals have shorter wavelengths (as hinted in the name), which will cause greater propagation loss through both air and most physical objects — including windows, which are often coated with UV protective films, which strongly attenuate mmWave RF. This means 5G mmWave service will require greater radio density and strategic placement/alignment. It will also make signals more vulnerable to interference, and requires test equipment with lower noise floors and faster sweep speeds in the mmWave bands.

The Field Master Pro MS2090A handheld real-time spectrum analyser provides several valuable solutions for spectrum clearing at mmWave. To begin, users can use the instrument in conjunction with Anritsu's Mobile InterferenceHunter to map out their coverage area and identify any hot spots with potential RF energy. They can then pinpoint the location of the potential interference and work to clear it out.

The instrument also offers 110 MHz of real-time spectrum analyser (RTSA) bandwidth and power density display to watch out for difficult-to-find, intermittent interference. With an omnidirectional antenna, the instrument can be set up in an infinite persistence and left to run for minutes or hours to ensure no signals are present. Once spectrum is clear and radios are going up, it will be key to ensure the radios are configured correctly and performing per standard. The Field Master Pro MS2090A offers a full 5G NR demodulation suite, which decodes the SSB beams to provide the following information:

- Cell ID, Sector ID, and Cell Group — important for verifying the configuration of the radios
- Frequency error — where less error promotes greater signal quality and faster throughputs
- Time offset — all 5G NR signals should be tightly synchronized to GPS to avoid interference between cells
- Individual beam RSRP, RSRQ, and SINR — key indicators of radio performance and signal quality
- EVM of the individual SSB parts
- Multi cell measurements — a measurement of multiple radios in the same to identify radio handoff points and possible gaps in coverage
- Channel power / occupied bandwidth.

Anritsu's Field Master Pro MS2090A is specially designed to handle the challenges of mmWave installation and maintenance. The Field Master Pro MS2090A gives users the most accurate, robust measurements possible and is the first solution to provide full, uninterrupted frequency coverage from 9 kHz up to 54 GHz. It allows users to test any 5G NR signal — from FR1 to FR2 and anything in between.

**Anritsu** Advancing beyond

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## SUCCESSFUL MESH RADIO DEMONSTRATION CONDUCTED

South Australia-based C4 Edge partner Solinnov has demonstrated the mesh capability of its BlueBottle multi-mission, software-defined radio, capable of RF signal detection and countermeasure generation.

Solinnov's BlueM infrastructureless network was used to demonstrate a Blue Force Tracking scenario and the geolocation of emitters at an event attended by representatives from Army Headquarters (Land C4), the Defence Science and Technology Group, electronic warfare company DEWC, and fellow C4 Edge partners Shoal Group and Acacia Systems.

Traditionally, cellular 4G would be used for networking to demonstrate geolocation capability, but that has limitations as the infrastructure is not always readily available. A BlueM network is a self-forming and self-healing network made up of BlueBottle radios, each one integrated with a transmit-receive module and an antenna, using Solinnov's Halite orthogonal frequency-division multiplexing waveform.

Solinnov plans to continue to enhance the network to be immune to electronic warfare, making it harder to detect, geolocate and jam. There are also plans to extend the capability to become an adaptive radio that optimises to the operating environment.

The C4 Edge program is an Australian Army-sponsored sovereign industry initiative involving more than 20 Australian businesses across the country. Initiated by army in 2019 to understand the breadth of local C4 industry capability, the program has progressed to the design, development and manufacture of a sovereign Battlegroup and Below Battlefield Command System prototype for demonstration in the coming months.



## Portable spectrum analyser

New base models for the Rohde & Schwarz Spectrum Rider FPH analysers take spectrum analysis capability up to 44 gigahertz. They combine the functionality of benchtop instruments and the lightweight portability of a handheld instrument, with features to make performance measuring simple.

Large buttons and a multi-touch gesture screen make it easy to operate. New higher frequency models enable the Spectrum Rider to perform a broader range of measurement tasks. The analyser has high sensitivity of  $-160$  dBm and measurement accuracy of typically 0.5 dB between 10 MHz and 3 GHz, offering RF 1/2 performance. The new models support field applications such as verification of 5G, broadcast, radar, defence and satellite communications links.

Weighing just 3.2 kg for the 44 GHz model, its battery lasts up to 4.5 h, making it a suitable handheld spectrum analyser for any field task. The backlit keypad allows users to work in the dark and the non-reflective display supports a daylight mode for improved readability in direct sunlight.



The handheld spectrum analyser family boasts a large-format capacitive touchscreen that makes it easy to adjust settings such as frequency, span and reference level and to set markers. Plus, large buttons and a practical multifunction wheel facilitate operation with gloves in outdoor environments.

The analyser can be remotely controlled via USB, or LAN and the R&S MobileView app for iOS or Android.

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# Radio Matters

Well here we are into a new year already.

In January, RFUANZ launched a new website — much more streamlined and easier to navigate through the various pages and services we have to offer. One of the pages I would especially like to draw attention to is our upcoming Comms Connect/RFUANZ Exhibition and Gala dinner to be held at Te Pae in Christchurch, on 11/12 May 2022.

The site is now open for you to easily register for our Gala Dinner and nominate worthy recipients for the Industry Awards. Please visit [www.rfuanz.org.nz](http://www.rfuanz.org.nz) for this information and more.

An area that has not been well used in the past is the 'Stolen Equipment' register. As we all know, many of us have at some time been victims of theft; much of our expensive equipment being lost forever. We would like to encourage all members and non-members to use this page to report any stolen equipment, so others in the industry can keep an eye out for it and hopefully recover for you.

In 2014, with frequencies 174–230 MHz becoming available, RFUANZ made submissions to New Zealand's RSM for use in various parts of this spectrum. We were finally granted access to 174–184MHz, or G Band as we call it.

At the time, while considerable advertising was undertaken to encourage use of this part of the spectrum, it has been sadly underutilised. We appreciate that equipment is limited to use this band; however, if we do not use it, there is a very real fear of this spectrum allocation being taken away. I urge you all, especially city/local councils, to use this spectrum.

Lastly, I would like to take this opportunity to wish you a very prosperous 2022 and look forward to seeing many of you at the conference.



*John Laughton, Chairman Radio Frequency Users Association of New Zealand*

## Ethernet ARINC server

Metromatics has released the Alta Data Technologies ethernet ARINC-429 server. Built directly in-line to a small, rugged cable assembly, the NLINE-EA429 connects ARINC devices to notebooks, desktops and servers via 10/100/1000 ethernet.



In addition to 4 or 8 channels of ARINC RX/TX message controls, NLINE-EA429 can generate or capture (o-scope) raw bus signals for protocol and electrical troubleshooting and cybersecurity modelling. It is accompanied with the AltaAPI SDK and AltaView Windows analyser to provide quick integration for ARINC applications. For most existing applications, the NLINE-EA429 can be used with little or no code changes.

The server can auto convert (bridge) ARINC-429 RX label groups to ethernet without any programming. NLINE designs are FPGA hardware-based UDP thin servers that provide real-time ethernet/ARINC bridging/conversion, reducing threats of viruses or internal hacking.

The server provides the controls of traditional ARINC and 1553 interfaces and can simultaneously auto bridge time-stamped ARINC-UDP packets without any programming. There is a fast auto-boot feature and RX/TX controls can be managed through standard socket communications as implemented in almost every OS, even DO-178 compliant systems.

**Metromatics Pty Ltd**

[www.metromatics.com.au](http://www.metromatics.com.au)

## Mission critical services radio

Hytera has launched the PDM680, its first ruggedised 3GPP-compliant mission critical services (MCS) radio. It is equipped with push-to-talk (MCPTT), video (MCVideo) and data (MCData) services to support those working in challenging conditions.



The radio's IP68 rating and MIL-STD 810H certification ensures it will continue to operate reliably in extreme environments. The radio is designed to enable first responders to hear and be heard clearly. Audio technology can reach a maximum SPL of 118 decibels. Moreover, AI-based noise cancellation, echo cancellation and wind noise cancellation technologies minimise background noise and boost audio clarity.

The radio provides eMBMS and 40 ms MCH scheduling period (MSP) functionality, which allows users to initiate a multi-cast session with a quality of service and without user congestion.

The LTE performance (TRP/TIS) of the PDM680 in key frequency bands is improved by about 2 dB compared with off-the-shelf broadband devices to help maintain stable communications even in situations with weak signals. The priority quality of service (QoS) of the HyTalk MC solution ensures first responders are given high priority over any other commercial users. With DMR technology, the PDM680 can provide device-to-device (D2D) communications whenever LTE connectivity is unavailable.

Its MCS-DMR simulcall can call both MCS devices and DMR radios simultaneously; this helps commanders initiate the MCS and the DMR calls at the same time with the press of the PTT key.

**Hytera Communications Co. Ltd**

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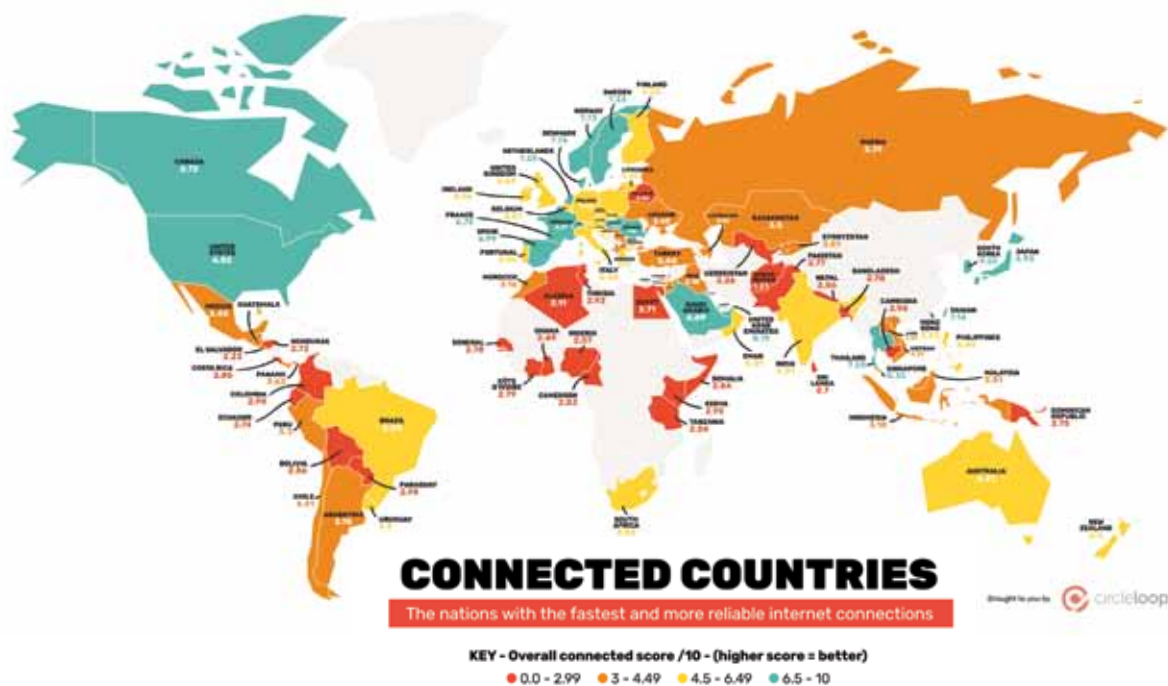
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# THE WORLD'S MOST CONNECTED COUNTRIES

## WHICH NATIONS HAVE THE FASTEST AND MOST RELIABLE INTERNET CONNECTIONS?



One company's research returns interesting results, especially regarding Australia.

A United Kingdom company decided to research and compare the different internet speeds for countries around the world. The results were intriguing from an Australian point of view.

Circleloop analysed the connection speeds, as well as the availability of mobile internet services such as 4G and 5G, in 97 countries. Each of the six factors studied gave each country a normalised score out of 10, then an average of these six scores determined the overall score out of 10.

The clear winner was South Korea, with a score of 9.55 out of 10 across the six factors researched. South Korea scored highly across the board, being the top-ranking nation when it came to average fixed broadband upload speed (227.26 megabitpixels per second) and narrowly

missing out on top spot when it came to the availability of 4G, with 98.3%.

Supposed industrialised and connected countries did not fare so well: the USA, Australia, UK and Canada all missed out on a place in the top 10. The US came 15th, Canada ranked 19th, Australia was 23rd, the UK came in 28th place and New Zealand came in 21st.

A reliable and fast internet connection is vital these days, especially in a world where more are working from home than ever, with some choosing to abandon the office altogether and work while travelling the world as 'digital nomads'. A good connection enables personnel to work effectively whether working remotely or from the office and stay with colleagues right around the world via video or conference calling.

Another Asian country with a well-developed economy came in second: Singapore. It had the fastest download speeds when it came to fixed broadband and boasted the second-highest fixed download speeds, along with good 4G coverage: 94.2%. The

United Arab Emirates was the third country to fill the top three, with an overall score of 8.19 out of 10. Switzerland was the first European country coming in at 4th with a score of 7.81.

Australia's score of 6.21 came from the mix of results from being 6th in mobile download speeds, 40th in broadband download speeds, 18th in mobile upload speed, 57th in broadband upload and 8th in 4G availability.

Data for the average download and upload speeds of both mobile and fixed broadband internet were sourced from the Speedtest Global Index, using April 2021 data. 4G availability was sourced from Opensignal's State of Mobile Network Experience 2020 report and refers to the average proportion of time Opensignal users spend with a 4G connection on their operator's network. Whether 5G had been launched or not was sourced from the European 5G Observatory.

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# Sydney Airport upgrade



L3Harris Technologies has been awarded the initial planning and design phase of a potential US\$343 million, 10-year contract to modernise Airservices Australia's enterprise-wide telecommunications network, working with Australian partners.

Under the first phase, L3Harris will design organisation-wide voice and data networking, VHF radio communications and automatic dependent surveillance-broadcast (ADS-B) surveillance capability to Australia's air navigation system. In partnership with Airservices, L3Harris will lead a consortium to plan and design an integrated, enterprise system to support all telecommunications, radio communications, ADS-B surveillance and network services for the National Airways System, including support for civil aviation, aviation rescue and firefighting services.

For the initial planning and design phase of the program, the consortium members will provide the following services: NTT Australia will provide overall network and site design for the enterprise and operational, air traffic network and telecommunications; Thales Australia will provide system design for the new ADS-B surveillance service and engineering services to ensure safe and secure implementation; Rohde & Schwarz Australia will provide design services to modernise the nationwide VHF radio network with their latest version of voice-over-IP VHF air traffic control radios; and Ventia will provide site audit, system site design and installation planning services for this initial phase of the program.

**L3Harris**  
<https://www.l3harris.com/en-au/australia>



## Impedance battery tester

The Tekon 960 impedance battery tester from Valen Power provides impedance testing of individual cells through to large battery banks (200 VDC). The tester can be used in critical battery bank applications to identify defects and battery ageing before a crisis occurs and help prevent site downtime and unexpected battery failures.

Designed to make technicians' field service maintenance effortless, the Tekon 960 has many advantages which allow the user to effectively test, diagnose and evaluate the health of the individual cell and battery bank. The tester is designed to produce fast and accurate results, saving technicians time onsite and increasing productivity. These results can be effortlessly transmitted to a mobile app while onsite or computer and exported to CSV/Excel for analysis. Additionally, all results are effectively recorded and stored, with no risk of lost data.

Features include: the ability to measure impedance on individual battery cells and battery systems of up to 400 VDC; measures AC voltage of up to 200 V for UPS; measures ripple voltage, current and temperature; diagnoses ageing batteries and predicts the life span based on historical data allowing the user to time the battery replacement; can store historical battery results in its 8 MB memory; auto-hold and data storage; prints out measurement data in reports; transmits measurement data via Bluetooth to a mobile app and computer software.

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## META'S TIP COLLABORATES WITH WBA FOR WI-FI 6E

The Wireless Broadband Alliance (WBA) announced an expansion of its relationship with the Telecom Infra Project (TIP) that will further TIP's Open AFC Software Group and help spur global adoption of Wi-Fi in the new 6 GHz unlicensed band. The partnership will maximise the benefits of 6 GHz Wi-Fi today and the near future Wi-Fi 7, and all types of use cases that can benefit from it — including indoor and outdoor venues that have adopted OpenRoaming.

Over 41 countries worldwide have already designated 6 GHz for unlicensed use, and many others are actively working to open up the band. Many of these countries see the value of enabling standard power operations that would require automated frequency coordination (AFC). The goal of Open AFC is to develop an open-source reference implementation of an AFC system.

This framework will enable unlicensed devices in the 6 GHz band to operate outdoors as well as increase their indoor range while ensuring that existing services are protected from interference. Enabling the full benefits of 6 GHz Wi-Fi with an AFC system will deliver all the public Wi-Fi benefits of OpenRoaming including automatic friction-free onboarding for users while managing privacy and security and enabling different identity options.

In May 2021, TIP adopted the WBA OpenRoaming standard, which enables users to securely roam from location to location without the need for logins, registrations or passwords. WBA will collaborate with TIP to define how Open AFC will work and how public and guest Wi-Fi based on OpenRoaming can benefit from the full capabilities of Wi-Fi 6E.

Open AFC also complements TIP OpenWiFi. This initiative reimagines the way Wi-Fi networks are built and deployed by leveraging open-source development and automated testing to allow Wi-Fi service providers to confidently deploy APs, cloud controllers and smart analytics from different vendors.

## Handheld radio

The Motorola Evolve is a purpose-built handheld radio suitable for Wave PTX broadband push-to-talk users.

Due to an expanding choice of data networks, radio users now have more ways to connect with a business than before. The communications landscape evolves quickly and needs are always changing. Keeping a fleet of user devices and in-field teams up to date and ready for the future is a challenge.

Built for business- and mission-critical environments, the Evolve LTE handheld device combines intuitive user experience and open platform architecture with ruggedness and reliability expected of a critical communications device. It enables communications across different locations and networks.

The device is designed for teams to use the cutting edge of technology today and be ready for the innovations of tomorrow.

**Ace Communication Distributors Pty Ltd**

[www.acecomms.com.au](http://www.acecomms.com.au)



## Long-range PoE switches

D-Link has expanded its selection of long-range (250 m) Power over Ethernet (PoE) switches with the addition of a full gigabit range (DGS F-Series) to complement the existing 10/100 Mbps products (DES F-Series) on offer. Designed for surveillance systems integrators and companies who deploy camera and monitoring solutions.

Designed as part of D-Link's entry-level unmanaged PoE switching solutions, the DGS F-Series sports Gigabit (1000 Mbps) on all ports, whereas the DES range comes with 100 Mbps per port, as well as Gigabit uplinks. All models have features including long-range PoE, VLAN, QoS and auto PoE reset functionality.

The 250 m PoE capability of the switches assists with deployments where a camera or a Wi-Fi access point needs to be installed at a distant location where the standard 100 m cable length is a limitation. When mixing video traffic with other traffic, users often want to apply priority to video streams to avoid video stutter and dropped frames. The switches offer a simple VLAN whereby users can easily isolate ports from each other, without the need for additional configuration, alongside automatic QoS to prioritise video and voice traffic.

The units include the ability to reset connected PoE devices using the automatic PoE reset function, or AI PoE. If a device, for whatever reason, stops responding, the switch automatically detects this and resets the electric current supplied to the device momentarily, causing the device to reboot itself.

**D-Link Australia Pty Ltd**

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## How technology can protect lone workers

**L**one workers are employees that cannot be seen or heard by a colleague for either all or part of their working day. Think of in-home carers that visit vulnerable people.

Or technicians that visit a site on their own. But that definition has broadened significantly through the pandemic. Workers that were traditionally in an office or working closely with others are now operating independently, making them more vulnerable to risks that they previously weren't exposed to.

Organisations have a growing number of lone workers to whom they owe a duty of care. While much of the initial focus of the rapid shift to remote working targeted productivity, worker safety is equally, if not more, important. There are a number of key issues for organisations to consider as the number of lone workers has increased. The most obvious changes are that the time and place of work has shifted. Instead of working in centralised offices, people are working from home, libraries, cafes and other locations. And their work hours are more flexible. Many workplaces, especially more progressive ones, have shifted their thinking from people working fixed hours to focusing on outcomes. Communications have always been important but need to be adapted to increasingly remote work.

For workers exposed to potentially hazardous situations, having the ability to easily respond to a message with a single tap or click, or having a duress alarm that can be easily activated can ensure that workers are safe. And that can include automatic escalation of an issue if a worker doesn't respond to an alarm in a timely way. When it comes to ensuring people's safety, understanding where people are during an incident is vital. During an emergency, knowing where people are can make a marked difference in the nature and speed of the response. Instead of spending time looking for people, location-aware apps and services can tell you whether someone is in the danger zone so they can be notified. It also ensures people not directly impacted aren't flooded with unnecessary messages. The focus on location can be extended through the concept of a 'safe corridor'. A safe corridor is a way that a worker can transit with enhanced duty of care. As they are moving between two locations, if they don't check-in with a defined time, a distress message is automatically triggered. In addition, it can trigger the automatic capture of audio and video so a quick reconnaissance can be carried out to assess the situation to ensure anyone coming to help the worker is not exposed to a dangerous situation without being properly prepared. This type of geofencing can also be used to alert people when they enter a potentially hazardous

environment. For example, if a field worker is entering a site that has poor ventilation or a requirement for specific personal protective equipment (PPE), they can receive an automatic alert as they enter the area. While there may be concerns about privacy, these can be allayed by only enabling these fences when they are required and by ensuring the employee proactively shares their location.

With more and more people working independently and remotely, organisations need to ensure they maintain their duty of care obligations. They can no longer rely on most team members being in the same place or that traditional communications methods will reach people in a timely way. Services, such as those offered by Everbridge can be used to provide panic button capability on smartphones, tablets and wearables and automated check in using geo-location and safe corridors.

The right technology can help organisations mitigate the risks of a growing number of lone workers.



**Everbridge Australia**  
[www.everbridge.com](http://www.everbridge.com)



# PUBLIC TRANSPORT CALL FOR BETTER CONNECTIVITY

## 2500 PASSENGERS SURVEYED IN GLOBAL REPORT

Post-pandemic public transport passengers indicated record levels of support for government investments to make transport safer.

**B**AI Communications published a white paper report revealing an intensified need for continuous connectivity on public transport systems amid the global COVID-19 recovery. In 2021, global public transport passengers indicated record levels of support for government investments in wireless and fibre network infrastructure (93%), 5G networks (89%) and technology applications and services designed to create a safer and a more connected journey.

The connectivity outlook report highlights findings from a recent study commissioned by BAI, which surveyed more than 2500 rail, subway, light rail, bus and ferry transport passengers across five major cities: New York, Sydney, Toronto, Hong Kong and London. In its third year, this report indicates that passengers want three core things: improved safety and cleanliness, advanced technology to support high-quality connectivity on-the-go, and increased spending on communications infrastructure to improve the overall transport experience.

Among the top findings:

- Just over half (51%) of passengers say

they would take public transport more if it were safer, a significant jump from 42% in 2020.

- 68% of passengers would like to see connectivity-related safety features in the public transport system.
- 43% of passengers increased their use of public transport thanks to safety and public health improvements.

Public transport systems are increasingly expected to provide a seamless and connected experience for passengers, a fact that has only intensified in the aftermath of COVID-19. From stronger Wi-Fi signals to enable remote work during commutes, to contactless booking and payment applications and services, public transport users want better technologies to enhance their trips.

Additionally, passengers in all cities noted an increased desire in 2021 to use apps to alert them to environmental conditions along the commute, such as temperature and pollution levels, as well as emergencies. They are also not opposed to their anonymised data being used to personalise their experience and improve transport service overall:

- 91% of passengers think seamless mobile coverage above and below ground is a feature of a world-class city.
- 83% are comfortable with their anonymised data being used to improve public transport systems.
- 91% are comfortable with their data being used to deliver customised alerts about service changes, disruptions or delays.

BAI's research suggests that passengers recognise the critical role of transport networks as an enabler of connectivity across cities and increasingly support government spending toward improvements. Most passengers (93%) support government investment in new and reliable wireless and fibre networks for transport. Further, 89% would support their city investing in a 5G network, up from 83% in 2020. 49% would pay more for public transport that offered uninterrupted mobile coverage and high-speed internet across the entire trip — a consecutive increase during the past three years.

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# NBN ANNOUNCES EMERGENCY MANAGEMENT PREPAREDNESS

**T**he NBN Co is calling on Australians to put safety measures in place this disaster season and follow some simple tips to help maintain communications during emergency and disaster events. It is backing this up with a rollout of emergency equipment Australia-wide ready for emergencies across the country this summer.

While it is always important for households to be prepared in the event they lose connectivity, disaster season provides an opportunity for companies to refresh contingency plans and make sure employees are aware of safety procedures. NBN has temporary network infrastructure, which may be deployed, where it is safe, into communities following emergency events to provide temporary internet services at community hubs and relief centres.

This season's recovery efforts will be boosted by the addition of 58 new pieces of temporary infrastructure, including multi-technology trailers (MTT), network on wheels, wireless mast trailers and hybrid power cubes, which will be stationed in

different locations across the country for potential deployment if needed.

The \$6 million worth of infrastructure equipment, which was partially funded by the Australian Government's Strengthening Telecommunications Against Natural Disasters (STAND) package, joins NBN's fleet of Sky Muster trucks and portable satellite kits, which also help provide communities with connectivity in the aftermath of emergencies.

NBN also continues to roll out the disaster satellite service, with up to 2000 satellites to be deployed as part of the federally funded STAND package. These satellite service units are being installed at designated emergency management sites and evacuation centres across the country. The services provide a back-up communications connection using satellite technology and can be switched on during an emergency event, providing free full satellite broadband functionality, including Wi-Fi and video streaming.

MTT trailers are self-powered via hybrid battery and generator with optional solar. They have a base capability to support fibre to the node, with the option to bolt on fixed wireless and hybrid fibre coaxial (HFC) capability.

The wireless mast trailer is a transportable pneumatic mast trailer primarily used to support the fixed wireless network. It can be used to replicate a small 18-metre-high tower, allowing quick and temporary installation of antennas and microwave radios in an emergency event. It can also be used to boost wireless access point signals if deployed in conjunction with other capabilities such as a satellite flyaway kit.

Hybrid Power Cubes are hybrid technology power generation units that combine solar, battery and compact diesel generator technologies to primarily enable NBN fixed wireless facilities to operate for long periods of time without a power grid connection. These can also be used to support TNI deployments and other NBN technologies.

The Network on Wheels trailer is a towable enclosed trailer containing rack space, cooling, power systems, fibre distribution and devices for a small exchange. It can be used to support fixed wireless and fibre to the premise, node and/or curb networks.

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# ETSI LAUNCHES RECONFIGURABLE INTELLIGENT SURFACES OPTIMISING ANY PRODUCT INTO WIRELESS NETWORKS



The intent is to leverage smart radio surfaces with thousands of small antennas or elements to dynamically shape and control radio signals.

European agency ETSI has launched an industry specification group on reconfigurable intelligent surfaces (ISG RIS). The group has been created to review and establish global standardisation for RIS technology. The outcome is to improve network performance with cost-effective, low-power and sustainable technology for future wireless systems.

RIS is a new type of system node leveraging smart radio surfaces with thousands of small antennas or metamaterial elements to dynamically shape and control radio signals in a goal-oriented manner. The technology will effectively turn the wireless environment into a service, inspiring a host of new use cases.

These include enhancing key performance indicators for various systems such as coverage and capacity, as well as enabling new applications such as localisation and sensing. As an example, an RIS can reconfigure the radio environment to sense human posture and detect someone falling, a useful application for elderly care.

RIS, thanks to its associated characteristics, is expected to serve as a key technology in future wireless systems, including for 6G.

Reconfigurable intelligent surfaces can be implemented using mostly passive components and, as such, the cost to produce, deploy and operate RIS may be lower compared to fully stacked cells relays. RIS can be potentially deployed for both indoor and outdoor usage, including offices, airports, shopping centres, even

lamp posts and advertising billboards. They may take any shape or be integrated into and onto objects. Additionally, the characteristics of RIS may result in low energy consumption, making it a sustainable, environmentally friendly technology solution.

RIS can be configured to operate at any part of the radio spectrum, including frequencies from sub-6 GHz to THz, and may use tools from artificial intelligence and machine learning (AI/ML) to enable systems operation and optimisation.

While extensive research efforts continue around RIS (also known as reflecting intelligent surface, large intelligent surface, smart repeater and holographic radio), global standardisation remains in its early stages. ETSI's ISG will work towards defining use cases, covering identified scenarios and clearly documenting the relevant requirements with a view to paving the way for future standardisation of the technology.

"There are, however, many technical challenges that need to be adequately addressed before RIS can be adopted into future standards, towards commercialisation of the technology, and the ETSI ISG RIS aims to identify and address some of these challenges," said Arman Shojaeifard, Chair of ISG RIS.

Reconfigurable intelligent surfaces will be a real value-added technology for services that will benefit society at large.

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## NSW Ambulance chooses Vertel to implement P25 radio network



Vertel has designed and implemented the NSW Ambulance service's Far West Project 25 (P25) radio network upgrade to improve coverage and network performance for critical communication operations.

NSW Ambulance has more than 6000 staff, including paramedics, doctors, nurses and corporate personnel, who provide communities with emergency health care and support, clinical care, and rescue and retrieval services across the state. Each year, one in six people in the state receive care from NSW Ambulance, with a call for help every 26 seconds. April 2021 marked 125 years of operation for the NSW Ambulance service.

NSW Ambulance needed a partner to redesign its P25 network to ensure that all geographical locations across NSW had coverage; that it had adequate safety measures in place for staff; that and the network remained resilient, without outages. Vertel won the tender by providing a solution that demonstrated an understanding of the requirements needed for NSW Ambulance's critical operations. From previous projects, Vertel was already a proven supplier to NSW Ambulance.

Worker safety is an ongoing concern for NSW Ambulance due to the number of assaults and other violent incidents involving frontline responders. Taking this into consideration, Vertel designed the platform to have GPS tracking on all vehicles and a duress button for paramedics. In the case of an emergency, the control

centre knows exactly where the personnel are and can dispatch appropriate resources to assist immediately.

The network has also been designed with the user in mind, with just one channel to ensure paramedics are always on the correct channel.

Vertel also considered the critical nature of the services NSW Ambulance provides and created multiple levels of redundancy in the network to ensure a single failure will not collapse the entire network. This involves two control centres, with the primary control centre based at Dubbo and the backup centre based near Wollongong.

NSW Ambulance covers an area larger than 800,000 km<sup>2</sup>; however, some locations struggled to receive coverage with the old network. Vertel adapted the design to overcome these issues and provide coverage throughout the state, while also implementing remote network monitoring to monitor any faults in real time and rectify them straight away.

NSW Ambulance also recently received an International Critical Communications Award (ICCA) for the Best Use of Critical Communications in Public Safety Category. This award recognised the work NSW Ambulance undertook with Vertel to build its Far West P25 radio network.

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# Talkpod

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The Talkpod N5 Smart series is exactly what the Australian PoC radio / Network market has been screaming out for: well-engineered, fast, great looking Android devices that look and feel like traditional two-way radios and function in a way that more than meets consumer expectation. Talkpod devices are extremely well engineered, deliver a great 'in hand' feel and provide a durability level that assures user confidence.

The Talkpod N5 Smart Series include Android 9.0, Open API, Google Play, Dual SIM, Man Down/Gyro, Vibration Feedback, Bluetooth 4.0/BLE, Wi-Fi 802.11 B/G/N, GPS, front & rear camera (N59 only), crystal

clear audio, all Australian 3G/4G bands including Band 28, and an IP66/67 waterproof rating.

One of the many qualities that separate Talkpod devices from their competitors is their ability to roam between different cellular sites, bands and technologies for the best signal with the greatest bandwidth to rapidly deliver an optimal level of service. The speed at which this roaming occurs leaves competitors in their wake setting new standards in the Australian PoC market.



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The past has seen a growth spurt with half of Australian enterprises invested in mobile technology, but most admit only partially integrated or not at all.

**P**oor integration is threatening businesses' potential in a defining year for enterprise mobility, a global research report from SOTI has found.

Half (50%) of Australian enterprises have invested in mobile technology or mobile security in the last year, with 71% saying the mobile technology had provided a positive return on investment (ROI). However, SOTI's 'A defining year: state of mobility 2021' report found that 63% of Australian enterprise leaders admit their technology is either only partially integrated or not at all, which is holding their businesses back.

The year 2021 has seen a mobility revolution, driving business growth and becoming a necessity to business continuity in the face of lockdowns and social distancing. The GSMA predicts that mobile operators

will invest US\$900 billion between 2020 and 2025 worldwide in upgrading services to meet ballooning demand for mobile connections and technology.

SOTI's global research has sought to understand the impact of mobile technology over the last year as well as how organisations can position themselves at the forefront of the post-pandemic mobile revolution. 1400 business leaders were interviewed from enterprises in eight countries across three continents, including Australia.

### Seizing opportunity or just surviving?

More than three-quarters (79%) of Australian enterprise leaders agree their organisation realises the importance of mobile tech much more now than before the start of the

COVID-19 pandemic, indicating that it has climbed up the boardroom agenda.

But, it has not all been smooth sailing. Two-thirds (66%) said that their organisation's portfolio of mobile devices has grown but managing the increased number of devices is proving difficult, indicating these Australian businesses might not have the right device management technology in place — or they have nothing at all. In fact, many existing tools do not adequately help organisations troubleshoot device issues or help to manage the devices. This leads to increased downtime, a loss in productivity and likely a loss in revenue as well.

Meanwhile, half (50%) say that their organisation is not using mobile technology to help it adjust well to the challenges of the post-pandemic marketplace. The challenge for these Australian companies is to fully



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integrate mobile technology into their core workflows to capitalise on the technology's potential to provide flexibility and intelligence across the whole enterprise.

The scope of this challenge is revealed in the answers given about aspirations and goals for the near future. In fact, 77% of Australian enterprise leaders agree that their company needs better business intelligence to navigate future unforeseen issues. Three-quarters (75%) also think they need better tools to diagnose issues before they become a problem and almost half (42%) would like to improve their ability to monitor data analytics.

### Planning for a post-pandemic marketplace

The pandemic, lockdown and subsequent changes in consumer behaviour have accelerated the digital transformation of business by up to six years. Businesses are faced with the prospect of a post-pandemic marketplace that is more fluid, more digital, more dynamic and marked by a rise in consumer demands.

The mobility revolution has scaled rapidly across all areas of business as they train for, adapt to, roll out and manage enterprise mobility. To prevent growing pains and ensure maximum uptime and productivity, as well as the best user experience, enterprises need to integrate and manage multiple form factors, operating systems and legacy systems. This is echoed in the findings with Australian enterprise leaders



**THE CHALLENGE FOR MANY BUSINESSES WAS THAT THE SPEED OF TRANSFORMATION MEANT THAT THESE MOBILE TECHNOLOGIES WERE OFTEN NOT INTEGRATED PROPERLY.**

saying their companies need the following post-pandemic:

1. Better business intelligence to help navigate future unforeseen issues — 77%.
2. Better tools to diagnose issues before they become a problem — 75%.
3. Improved security and user authentication across all mobile devices — 73%.
4. Ways to better manage their expanded portfolio of mobile devices — 66%.
5. Better data analytics, troubleshooting and issue resolution — 62%.

### Looking towards the future

In the immediate future, the recent pace of change looks like it will continue. Over the next 12 months, almost three-quarters (73%) of Australian organisations are considering increasing their expenditure on mobile devices, systems and/or security, while more than half (51%) of Australian organisations are considering increasing their expenditure on technology for better device and system integration and/or replacing legacy systems.

"The COVID-19 pandemic has forced businesses in Australia and beyond to become more reliant than ever before on mobile and

internet-connected technologies, to support a new way of working and operating," said Michael Dyson, VP of Sales, APAC at SOTI. "Many businesses had to invest in and roll out these technologies very quickly, while others that had already made investments in these technologies found themselves also having to scale up to meet the demands placed on them by fully remote operations. The challenge for many businesses was that the speed of transformation meant that these mobile technologies were often not integrated properly.

"Looking ahead, there is no doubt that the use of mobile technology will continue to serve as a lifeline for keeping operations moving in a post-pandemic world, so businesses will need to focus on improving integration to get the most out of their investments," Dyson continued. "Properly integrated technology will also prove crucial in helping organisations meet the changing demands of consumers, who have also become more digitally dependent during the pandemic."

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# NON-CELLULAR 5G TECHNOLOGY GAINS APPROVAL

## ETSI STANDARD SET TO CHANGE THE 5G INDUSTRY

The decentralised technology is designed for massive IoT networks.

**H**ailed as the world's first non-cellular 5G technology standard, DECT-2020 has been recognised by the WP5D of the International Telecommunication Union Radiocommunication Sector (ITU-R) and included as part of the 5G standards in IMT-2020 technology recommendation.

Released last year through ETSI, the standard sets an example of future connectivity: the infrastructure-less and autonomous, decentralised technology is designed for massive IoT networks for enterprises. It has no single point of failure and is accessible to anyone, costing only a fraction of the cellular networks both in dollars and in carbon footprint. It also enables companies

to operate without middlemen or subscription fees as well as to store and consume the data generated in the way they see best fitting for them: on premises, in public cloud or anything in between.

The ETSI 5G standard supports efficient shared spectrum operation enabling access to free, international spectrums such as 1.9 GHz.

Technology-wise, the non-cellular 5G is built on different principles from cellular 5G. One of the biggest differences and advantages is the decentralised network. In a non-cellular 5G network, every device is a node, every device can be a router as if every device was a base station. The devices automatically find the best route; adding a new device into the network routing works autonomously as well and if one device is down, the devices will re-route by themselves. It means reliable communication eliminating single points of failure.

A decentralised mesh with short hops and small transmission power also means a significantly lower carbon footprint of the communications system. A recent study in Tampere University in Finland saw an approximately 60% better energy efficiency at system level compared to traditional cellular topology with the same radio energy profile.

The ETSI DECT-2020 NR standard is suited for businesses such as smart meters, Industry 4.0, building management systems, logistics and smart cities. It will assist in the urbanisation, building and energy consumption in the construction of these smart cities.

It also opens opportunities for new use cases, scaling at mass the levels of communication for the future.

ETSI  
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## Wireless IVX mobile

The Auria Wireless IVX mobile platform enables users to seamlessly roam in and out of coverage from any of LMR, satellite, LTE and Wi-Fi bearers, all while maintaining secure encrypted P25 communications.

The unit does not decrypt or transcode the P25 stream, ensuring that client communications are not compromised and that critical P25 metadata are retained.

Example uses include providing communications coverage to users who stray out of LMR or cellular networks. By automatically providing fail-over to satellite services, users can continue their secure P25 communications all while retaining P25 caller IDs, location data and emergency calling features etc.

Least-cost routing (LCR) means that as soon as users re-enter areas of LMR or cellular coverage, satellite calls will automatically revert to those lower cost bearers, saving operators expenditure all while ensuring no black spots.

At only 0.4 kg, ultra-compact (approx. 14 x 4 x 11 cm) and ruggedised for industrial and harsh environment use, the platform also provides rich RF features, such as in-band/cross-band repeating, which are supported natively, as are P25 functional interfaces such as DFSI enabling P25 network augmentation.

The IVX is available today and field-proven by commercial, defence and public safety clients worldwide.

**Auria Wireless Pty Ltd**

[www.auriawireless.com](http://www.auriawireless.com)



## 5G edge server and accelerator

Adlink's MECS-61xx/72xx edge servers and PCIe-A100 FEC accelerator are designed to deliver processing power for reliability and expansion capabilities to 5G Open RAN.

5G Open RAN overcomes the limitations of proprietary designs that make interoperability between vendors difficult or impossible by introducing open architecture to the fronthaul of networking architecture. Built with cost-effective, commercial-off-the-shelf architecture, Intel Xeon Scalable and Xeon D processors, 4x10G SFP+ networking components and dual to four PCI Express x16 slots for processing, the MEC edge servers meet 5G needs for performance CPUs and GPUs with storage and memory for sustaining peak I/O rates.

The MECS-72xx series is a family of 2U 19" OTII-compliant and NVIDIA NGC-ready validated edge servers. NGC-ready validation means that MECS-72xx edge servers passed a suite of tests certifying ability to deliver performance running NGC containers and accelerate 5G Edge AI deployments across industries.

The MECS-61xx series is a family of 1U 19" OTII-compliant edge servers designed for the edge of 5G networks. It provides an open, white box platform for 5G Open RAN, private 5G networks and a wide range of 5G MEC applications. MECS-61xx edge servers meet multiple application and deployment requirements, enabling customers to focus on differentiating their end solutions.

The PCIe-A100 is a 5G forward error correction (FEC) accelerator based on the Intel vRAN dedicated accelerator ACC100 eASIC device. Supporting functions such as turbo coding and low-density parity check (LDPC), the accelerator increases channel throughput in edge applications while lowering data latency and overall platform power consumption.

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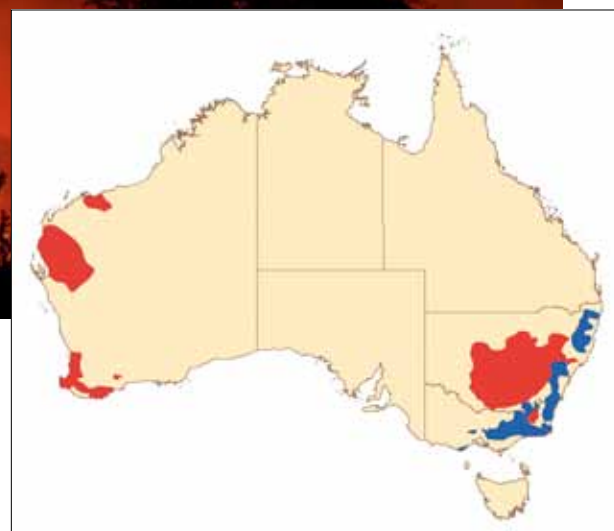
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## AFAC bushfire summer outlook

After a disastrous summer last year and La Niña drenching the east coast, are our firefighters in for another tough season?

AFAC, the National Council for fire and emergency services, has released its Bushfire Seasonal Outlook for Summer 2021, with varied fire potential for locations across Australia.

Recent rainfall has resulted in average to above average soil moisture and stream flows across large parts of eastern Australia. Influenced by the current La Niña event, the outlook for summer suggests above-average rainfall is likely over eastern parts of the country. The negative Indian Ocean Dipole, which has contributed to the wetter conditions over spring, is very likely to end in early December, as is typical of its seasonal cycle.

Despite this, the summer 2021 outlook presents above normal fire potential for large areas of NSW containing crop and grassland fuels, based on reports of high grass and crop fuel loads. Good growing conditions are forecast to continue with significantly above average yields from crops expected.

In Western Australia, the above normal fire potential in the north is driven by above average daily minimum and maximum

temperatures forecast across much of the state, combined with observed above average grass fuel loads. In the south of WA, increased grass growth has also increased the summer potential of bushfires.

Below normal fire potential is predicted in the ACT, NSW and Victoria due to increased rainfall and areas burnt during the 2019–20 fires.

While most of Australia shows normal bushfire potential during the summer outlook period, destructive and deadly fires can still occur during normal bushfire seasons across Australia. Fire potential can vary greatly, even at the smaller scale, between bordering states and territories. Each state and territory's assessment considers different land use types and vegetation types. This in turn is influenced by different forecasts for temperature and rainfall over these regions. The Outlook provides further detail on each state and territory's fire potential.

AFAC Director National Projects and Innovation Rob Webb said the Bushfire Seasonal Outlook is an important tool used by fire and emergency service authorities to prepare their operational response.

"Developed by fire and emergency services and the Bureau of Meteorology, the

Outlook provides a national picture of fire potential to assist operational and strategic planning for the coming months. This is especially important as they balance the risk of bushfire this summer with the risks associated with a La Niña event, such as an increased chance of rainfall and the number of tropical cyclones that form.

"Managing these concurrent risks reflects the complex environment that fire and emergency service professionals operate in. The Outlook is the result of fire agencies working together to map Australia's fire potential for the upcoming season, and provides the evidence base for agencies to make key decisions to keep communities safe this summer."

This Outlook was developed by AFAC, the Bureau of Meteorology, Queensland Fire and Emergency Services, the NSW Rural Fire Service, ACT Emergency Services Agency, ACT Parks and Conservation Service, Country Fire Authority, Department of Environment, Land, Water and Planning Victoria, Tasmania Fire Service, SA Country Fire Service, Department of Fire and Emergency Services and Department of Biodiversity, Conservation and Attractions WA, and Bushfires NT.



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