The New Standard for In-Building Wireless
The Wireless World Indoors

- The most innovative DAS vendor
  - The only truly wideband Distributed Antenna System (DAS)
  - All cellular bands and all public safety bands
  - Any future bands

- Based on technology developed at Cambridge University and University College London

- Solution targeted at multi-service, multi-operator
  - Cellular and public safety
  - Wider range of buildings and applications than competitors

- Key Tier 1 customers across 5 continents

Part of McWane inc.
- Financial strength
- Global reach
- Best-in-class procedures and customer service

About Zinwave
The only TRULY future-proof in-building wireless coverage solution

No costly upgrades – No disruption to business – No re-installation or re-deployment

The most flexible and innovative coverage solution available

Only solution supporting all cellular and all public safety bands on a SINGLE hardware layer

The lowest total cost of ownership

No future upgrade costs, low power, low maintenance and low running costs

The only solution with a SINGLE hardware layer

All protocols, all current and all future MNO bands, all modulation schemes, on ONE layer

Simple to design and fast to deploy

ONE design for all services using fibre end-to-end for fast deployment and commissioning
The only TRULY future-proof in-building wireless coverage solution

Install UNItivity to meet current indoor wireless requirements safe in the knowledge that ALL future wireless technologies in the 150MHz – 2700MHz range will also be supported. UNItivity supports both FDD (2G, 3G, 4G, PMR, etc.) and TDD (LTE – current and future) technologies today. UNItivity is the ONLY solution that enables any mix of FDD and TDD across all global allocation to operate simultaneously.

What does this mean to you?
- No additional hardware is needed when adding new services
- Users experience no service disruption or down time when adding new services
- No future hardware costs
- Minimal or no disruption to the building
- No hidden mobilisation costs
- The ONLY DAS to support any mix of FDD (2G/3G/4G), TDD (4GLTE, 5G?) in SISO or MIMO (high capacity/high throughput).
UNItivity simplifies in-door wireless coverage

UNItivity DAS consisting of only 4 system elements, UNItivity has greatly simplified in-door wireless technology.

1. The Hub
2. Service Module – connection to base station
3. Optical Module – connecting Hub to Hub and Hub and RU
4. Remote Radio Units (RU)

What does this mean to you?
- Fastest deployment and commissioning.
- Less building disruption at installation.
- Low maintenance and running costs.
- Simplified system design.
- Low spares holding.
UNItivity runs over fibre optic structured cabling

Fibre optic cabling is now the infrastructure of choice for all new build construction and refurbishment projects. UNItivity is the ONLY in-building wireless solution which uses fibre end-to-end.

What does this mean to you?

Allows UNItivity to provide limitless capacity over a low cost infrastructure with the most flexible system design available because:-

- Fibre optic cable is a 50%-75% lower cost than coax.
- High performance infrastructure.
- FO installation is fast to install & causes minimal disruption to the building.
- Uses existing containment.
- Fibre optic cable has a transmission distance measured in kilometres while coax and Cat5/Cat 6 is measured in 10s of metres. This greatly increases the flexibility of in-building system design and means a single Zinwave system can cover a whole campus not just a single building.
The Wireless World Indoors

Simple UNItivity DAS structure

Zinwave Active Wideband DAS

- RF Services come from the Mobile Network Operators (MNOs), normally EE, O2 and Vodafone. Services can also come from Private Mobile Radio (PMR) used by security companies for their 2 way radios.
- The RF services are introduced to a UNItivity Primary Hub via coax cabling.
- The Primary Hub connects to Secondary Hubs or Remote Units (RUs) using fibre optic cable.
- Secondary Hubs, when used, connect to RUs using fibre optic cable.
- RUs are the remote radios which transmit and receive the RF signal within the building.
The Component Parts

UNIhub Chassis
- Primary and Secondary with common chassis
- 4 service modules
- 8 link modules
- Unique routing matrix
- Power control
- Self calibration
- Auto setup
- Remote management

UNIhub Modules
- Hot swappable
- Fiber based
- SMF/MMF
- Remote Unit or SH link
- Service or Remote Unit Link
- 2 x N-type RF ports

UNIremote
- Fiber based
- SMF/MMF
- PoE or local PSU
- 150MHz-2700MHz

The Wireless World Indoors
Total Cost of Ownership

Industry Leading TCO

ONE hardware layer supports any mix of services
- More service connections strengthens Zinwave’s commercial advantage
- The cost does not escalate when adding service to Zinwave, as they would with a traditional solution
- Wireless and IP

Unique future-proof benefit
- No costly upgrades
- Install now knowing any future service is supported

Fibre optic cable distribution throughout
- 50%-75% lower installation costs compared to coax cable
- Faster to install
- Minimal disruption to the building

Just 4 components
- Reduced maintenance spares holding
- Reduced support costs

Lower cost design and commissioning
Unique Solution for Elevator Coverage

- The only DAS that can provide this future-proof solution
- Small form factor
- One device allows all services, including WiFi
- Dedicated to each lift carriage
- Dedicated sector if required
- No service quality variation
- No cell handover issues
The separation between the dual-port antennas at the same location needs to be sufficient to provide at least 40dB of isolation between the TX and RX ports of the same remote unit. The integrated isolation in a dual port omni antenna such as the Kathrein 80010709 will provide > 30dB isolation between V and H polarisations. At 2.6GHz, physical separation would need to be in the order of 2M to achieve 40dB isolation.
Switch Matrix

- 4x4 distribution matrix both Primary and Secondary Hubs
- Configurable via the management system
- Enables routing of services into Hub

Inputs (Rear)

Outputs (front)

12
Warranty & Product Returns:
- In Warranty product return rate is only 0.7% across all 4 component parts
- Total return rate during the last 7 years is only 1.36% for all 4 component parts

MTBF:
- Operational MTBF is calculated on real field failures as per the return rates above.

<table>
<thead>
<tr>
<th>Operational MTBF (Hours)</th>
<th>Years</th>
<th>HUB</th>
<th>OM</th>
<th>ORU</th>
<th>SM</th>
</tr>
</thead>
<tbody>
<tr>
<td>295289</td>
<td>34</td>
<td>516</td>
<td>139</td>
<td>1003</td>
<td>8783025.6</td>
</tr>
<tr>
<td>4521744</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1221364</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8783025.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ISO9001:
- Zinwave recently achieved ISO9001 certification.
- Plexus Corporation (Zinwave’s factory) is also ISO9000 certified.
Plexus is a proven GLOBAL leader in advanced microelectronics manufacturing and assembly solutions and is uniquely positioned to manufacture and deliver microelectronic products that exceed our customers’ expectations.

Plexus provides

- State-of-the-art microelectronics Centre of Excellence in Boise, Idaho, USA
- Certified to ISO 9001 & ISO 13485 quality standards
- ISO-7, 10k cleanroom
- Leading edge processing and metrology equipment
- On-site failure analysis and reliability testing lab
- Complex higher level assembly
• Tested and Approved by:-
  • APPLE – Zinwave is THE global supplier of in-building wireless systems
  • NOKIA NETWORKS – Zinwave is the only DAS supplier to Nokia
  • Vodafone – Intend to offer Zinwave instead of Commscope
  • Verizon – US national network operator chose UK technology
  • IBM – Global supplier of wireless sport stadia systems

• Milestone projects
  • APPLE Headquarters – Largest building in the world
  • Rialto Towers – Largest building in the southern hemisphere
  • UK NHS – Supporting voice and data in clinical, life dependent areas
  • Saudi Airports – All 3 of KSA’s large airports chose Zinwave
  • Battersea Power Station – The UK’s largest single development project
  • Land Securities – UK’s largest corporate land owner chose Zinwave
  • MGM Grand Macua – MGM chose Zinwave
  • US Nuclear Power – Zinwave installed at US nuclear power plants
  • Erasmus Hospital – Europe’s largest hospital chose Zinwave
  • Westfield, Land Securities, Hammersons – Large shopping malls
Mobile Network Operators & Network Manufacturers

- Approved by all UK network operators
- Vodafone’s in-building wireless coverage system of choice.
- System of choice at Optus Australia.
- Installed in Singtel’s network.
- Actively sold by Telefonica
- Approved by Telstra
- Sole supplier of DAS to Nokia Networks worldwide
ANIXTER as a global distributor

- Relationship founded in Europe and the USA
- Distribution across 50 countries
- Created new Wireless Business Group to develop wireless “systems” business rather than component/product distribution.
- Zinwave is the preferred DAS product line, selected before Commscope, Cobham Wireless and Corning.
- Partnering Zinwave in major projects such as Battersea Power Station (UK) the largest single development in the UK.
- Head of Wireless Business Group is Colin Abrey, ex-Zinwave.
APPLE Headquarters

- 13,000 Apple employees will be based in the doughnut-shaped, four-story building that is located in Cupertino, USA.
- The building will be larger than the Pentagon, the previous largest single occupancy building in the world.
- Zinwave has been awarded the contract to install a multi-operator DAS. A project worth over $9 million.
- Zinwave is APPLE’s sole supplier of in-building wireless coverage systems for mobile cellular. This is a global agreement.
Rialto Towers

- The tallest buildings in the Southern Hemisphere.
- Multi-use occupancy for 3500 professionals in the financial, law, technology, media and consulting industries; retail and leisure.
- Consist of 2 mirrored towers located in Melbourne, Australia.
- Zinwave installed a multi-operator DAS with a mix of SISO and MIMO configurations.
- Tests performed by RFI confirmed Zinwave as the best performing DAS system with the highest throughput.
UK National Health Service

- Mid Essex Health Trust
- Addenbrookes – The UK’s largest Hospital.
- St Barts Health Trust London
- Pending – Papworth Hospital & Royal London Hospital
- Installed in all areas including clinical care (e.g. operating theatres)
- Chosen because once installed, no further building disruption will occur for the operational life of the system.
- 4G data over Zinwave’s DAS is used instead of WiFi because of budgetary limitations.
All 3 Major International Airports in Saudi Arabia

- Zinwave has been awarded the contract to install in-building wireless coverage at Jeddah.
- Jeddah is the largest single structure airport in the world.
- The Jeddah contract is worth in excess of $9 million.
- Zinwave has already installed systems at Riyadh airport and Dammam airport.
- Systems support Tetra and all local mobile network operators.
Thank you for your attention

Nigel Hopper
Sales Manager – Europe
Nigel.hopper@Zinwave.com
www.Zinwave.com