newave®

plug&play Portal

Product Overview

About newave®

- Develops optimized RFID solutions for today's most challenging medical, supply chain, retail and supply chain applications
- newave's patented wave® antenna embodies a radically new concept in antenna design providing true item-level tracking
- Platform based on the breakthrough patented wave® RFID antenna technology is the first and only antenna specifically designed for RFID use
- Technology developed by the world–class ElectroScience Laboratory of The Ohio State University
- Dr. Dennis Burnside, former Director and Professor Emeritus at ESL and The Ohio State University is the newave Chief Technology Officer
- Wistron NeWeb Corporation (WNC), the Taiwan-based global leader in electronics manufacturing is a significant investor and supplier
- newave's management team leverages a strong heritage in RFID solutions

newave® superior rfid accuracy

newave® Partnerships
Ohio State ESL and WNC

THE OHIO STATE UNIVERSITY
ELECTROSCIENCE LABRATORY

Advanced Research
and Testing

WNC
Wistron NeWeb Corp.

Strategic Investor
and Manufacturer

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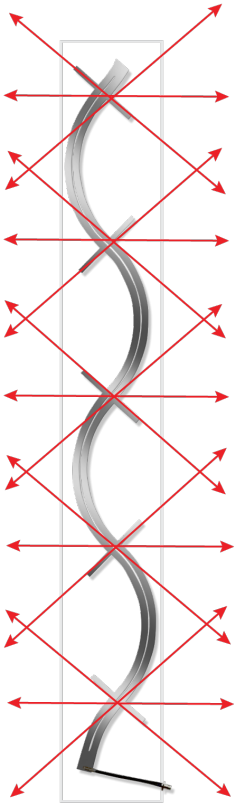
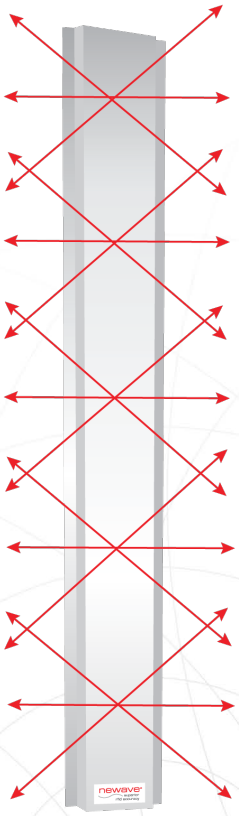
The wave® antenna



wave antenna
Radiator showing
distributed radiation

- The patented newave antenna embodies a radically new concept in RFID antenna design.
- Instead of radiating a beam in a single direction, the antenna is designed to uniformly illuminate a volume of space.
- When installed in pairs the antennas complement each other and provide spatial, beam and polarization diversity.
- Zone size 3 to 10 cubic feet
- Lightweight, comes in 3', 5', or 7' lengths
- Highly flexible to provide complete coverage in harsh environments such as metal, liquids, etc.



wave antenna
in ABS frame

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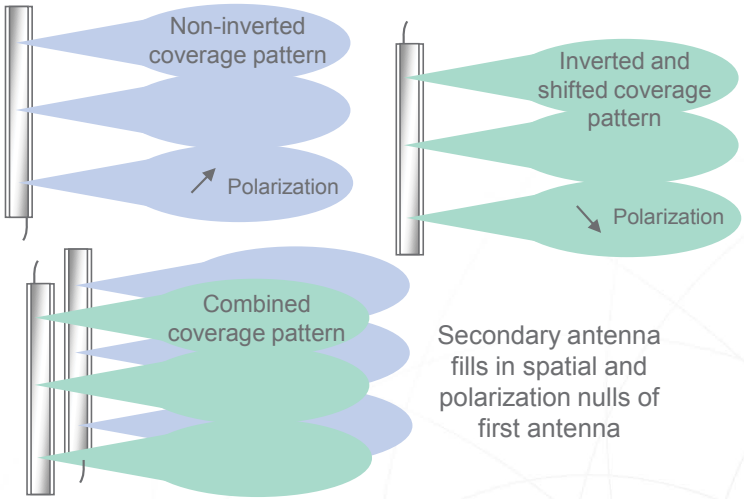
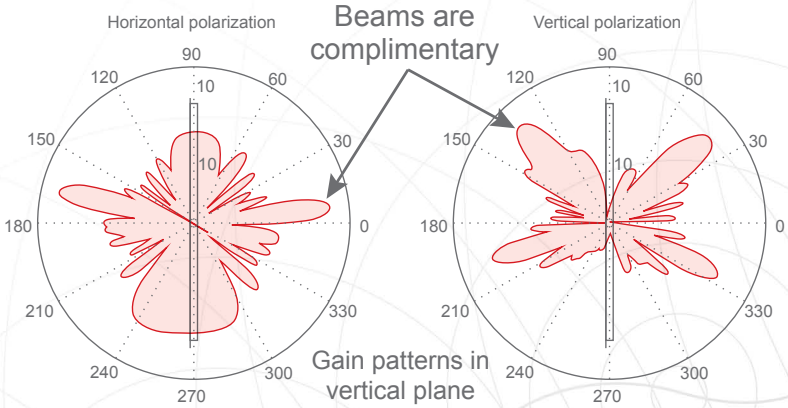
Density coverage of the wave® antenna

- Any single antenna covering a given area will have fading nulls caused by multi-path interference.
- The newave antenna is designed to overcome fading by mounting the antennas in pairs.
- The unique design produces a complementary coverage pattern simply by inverting and shifting one of the antennas.
- The inverted antenna is also cross-polarized with respect to its partner.

Complementary Coverage Pattern



Polarization Beam Diversity



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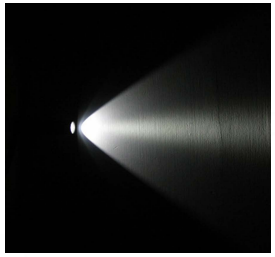
A Key Difference: wave® antenna vs. Traditional Patch Antennas

wave antenna analogy

"The wave Antenna, like a fluorescent light, creates a cylindrical pattern that illuminates the entire antenna length and a volume of the surrounding space as defined by the user"

VS.

Traditional Patch Antenna analogy



"Patch antennas perform similar to a flashlight. A conical pattern that is far reaching"

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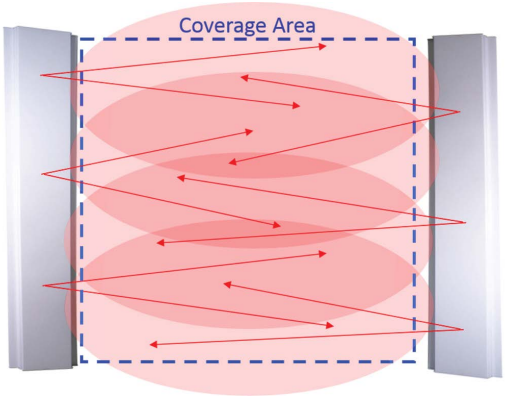
wave® vs. Patch Antenna Comparisons

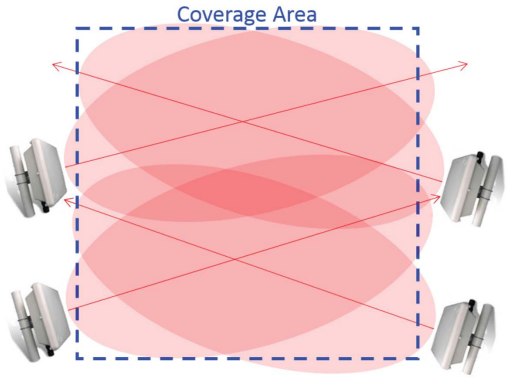
wave antenna



- Spatial, beam, and polarization diversity
- 5 beam illumination
- 2 antennas required to cover a specified area (on opposite sides or placed side-by-side)
- Distributed illumination
- Uniform medium range coverage
- Ideal for item level zone coverage of densely populated regions of RFID tagged products

VS.

Patch Antennas



- Spatial and polarization diversity
- Single beam illumination
- At least 5 patch antennas required to provide the same number of overlapping beams
- Long range capability

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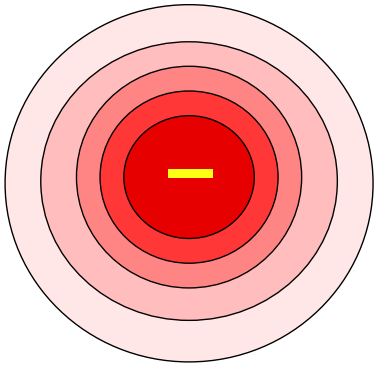
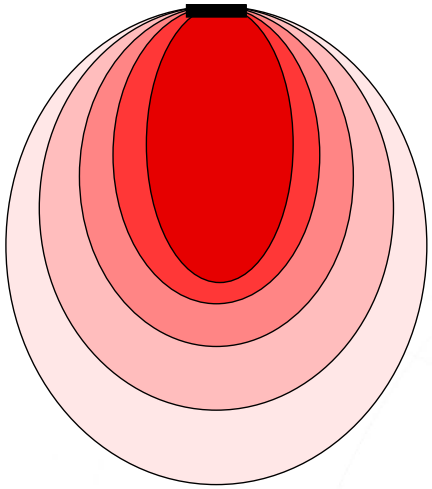
Top View of Coverage from wave® antennas and Portals

wave antenna Alone



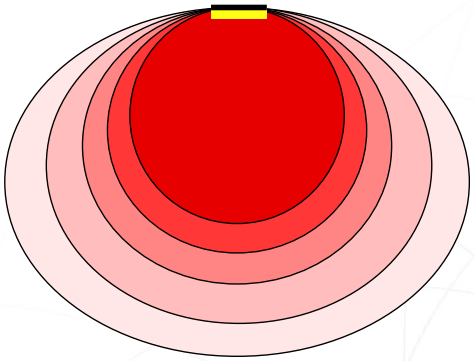
Omni-directional coverage intensities forming circles around the whole length of the antenna. Thus, it covers a full 360 degrees around the antenna.

newave Portal



Coverage is further focused to the front of the portal. Thus, it covers about 100 degrees in front of the portal.

wave antenna Ground Plane



Coverage is limited to the front half of the antenna by the ground plane placed on the backside of the antenna. Thus, it covers about 180 degrees in front of the antenna.

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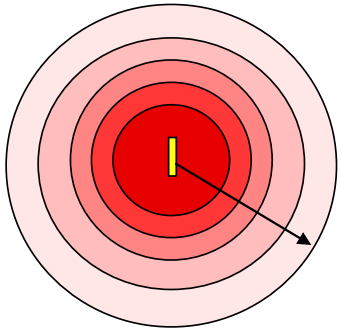
High Power (30dBm) Coverage

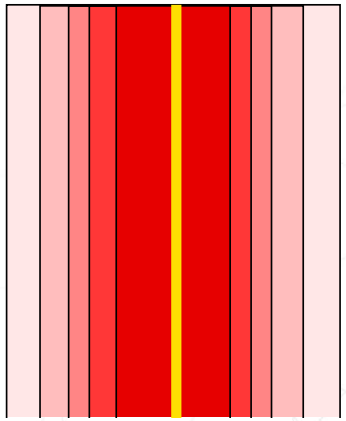
The normal operation for the patch antenna is high power so that it can provide maximum tag reading capability. Emanation rings indicate power levels at various read distances. Tag sensitivity and the object being tagged will also impact the effective range. Note that the patch has the same coverage in both the top and side views. The wave® antenna has full coverage around the antenna for its full length. Thus, it clearly has more coverage than the patch antenna as shown in the side view. Thus, the wave® antenna is more like a wide angle lens versus the telephoto lens representation of the patch antenna.

wave antenna

The coverage zone is about 12' diameter and 10' tall



Top View

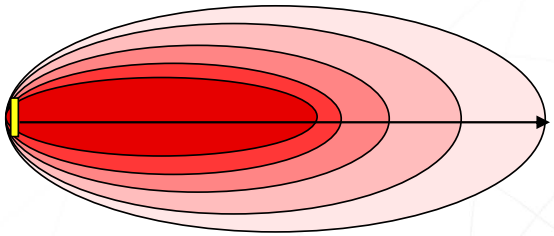


Side View

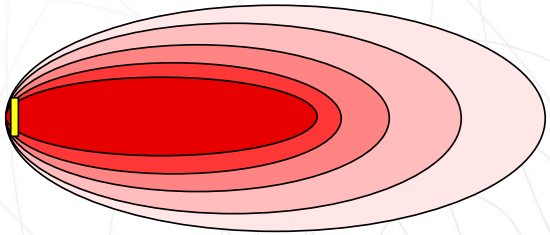
VS.

Patch Antenna

The coverage zone is about 30' in range and limited cross-range



Top View



Side View

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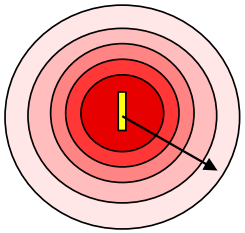
Medium Power (25dBm) Coverage

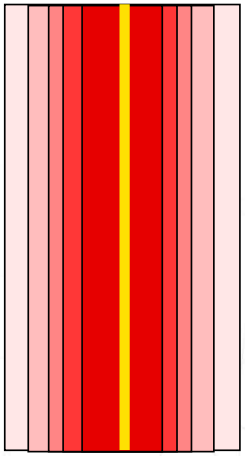
As the power is reduced to medium levels, the top view of coverage is about the same, the side view shows a significant reduction for the patch antenna. The wave antenna maintains good coverage along its whole length because it is unique design. This means that as the size of the coverage area is reduced, the wave antenna provides superior coverage in that the length of the wave antenna is chosen to fit the desired zone size.

wave antenna

The coverage zone is about 6' diameter and 10' tall



Top View

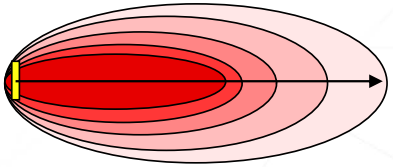


Side View

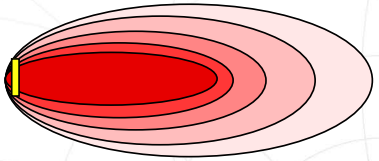
VS.

Patch Antenna

The coverage zone is about 15' in range and very limited cross-range



Top View



Side View

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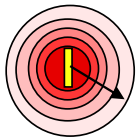
Low Power (20dBm) Coverage

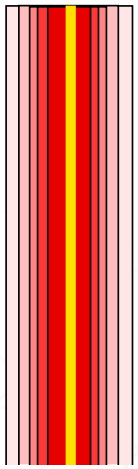
As the input power is further reduced to low levels, the patch antenna's coverage region tends to collapse back onto the patch in both the top and side views. Again, the wave antenna maintains very good coverage along its whole length to provide good coverage across the side view of the zone. There are many application where is coverage is very important. Consider a portal example where one wishes to control the coverage range away from the portal but the portal still must cover the full height of the portal.

wave antenna

The coverage zone is about 4' diameter and 10' tall



Top View

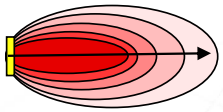


Side View

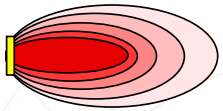
VS.

Patch Antenna

The coverage zone is about 10' in range and extremely limited cross-range



Top View



Side View

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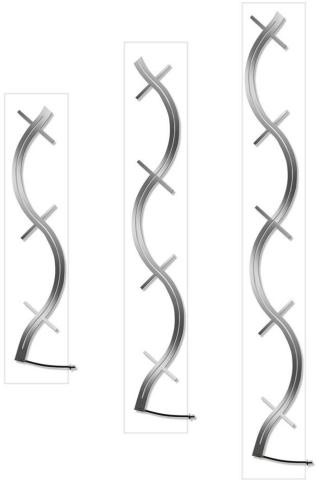
The wave's Unique Design allows Expansion of RFID Applications

Lightweight enclosures



Thin and flexible antenna elements

Used in infrastructure portals

Embedded in composite materials

Tracking items on retail shelves

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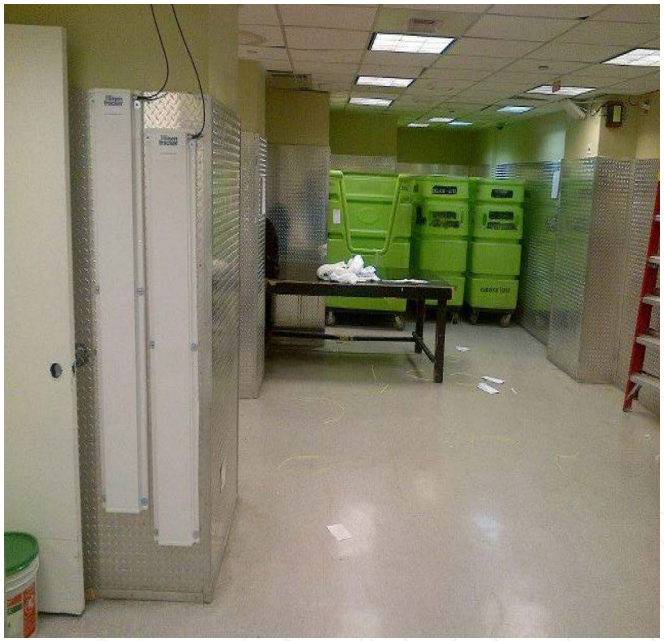
Basic newave® antenna Portal

Characteristics

- Lightweight
- Lowest Cost
- Available in 3,5 or 7 foot lengths
- Easily installed using plastic lip
- Mounts vertically or horizontally
- User defined zone coverage area: 3'x3'x3' to 10'x10'x10' Applications
- Interior doorways and hallways
- Wall read points
- Economy applications



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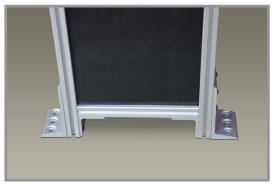
newave® plug&playPortals: Features and Benefits

The Unique Benefit of "Plug & Play":

- Two wave® antennas or the wave's radiating elements are embedded into the supporting portal structure
- This approach eliminates the need to adjust antennas to ensure tags are read, saving much time and installation cost
- Tag read rates with any newave Portal are in excess of 99%
- Being embedded the wave radiators will not go out of alignment even in very rugged environments thus requiring minimal follow-on maintenance
- Over 6,000 portals installed
- Installation time is five times faster than a traditional "patch" antenna portal

newave® plug&playPortal

Corner brackets are designed to fit in frame grooves and anchor to the floor



- This new portal was designed by Smart Label Solutions and is constructed with extruded aluminum frames, sturdy coroplast covers, and has two wave® antenna elements embedded in a composite structure
- Rugged enough for distribution centers but sleek enough for any business interior. Available in Gray, Safety Yellow, or White
- Simple installation. Nearly 6,000 portals are already installed
- Superior Accuracy and Performance. These antennas are designed to cover all three tag orientations and they never need to be adjusted.
- Very economical. Comes in 60 or 96 inch heights.
- Like our other NeWave Portals: They are Plug and Play
- http://www.rfidjournal.com/articles/view?14500

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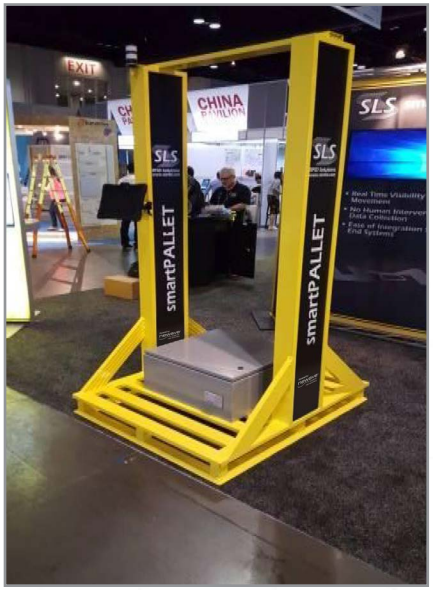
Specialized Portals

- Developed for Expanded Market Requirements
- Strong Aesthetics for Any Location
- Controllable Illumination
- Designed for Ease of Use and Installation

Pallet Portal



Office Portal

Direction of Motion Capability

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newave® Surround Portal

Characteristics

- Reads the most challenging RFID items
- Comes in various sizes. Newave does not provide portal walls.
- 4 wave antennas are easily installed on surround portal ceiling
- Illuminates at the highest allowable power density
- Light-weight composite materials, but very durable
- Easy to install Applications

Applications

- Great for reading densely packed items like towels, apparel, documents, parts
- Great for damp or wet items
- Loading docks, conveyors, distribution centers

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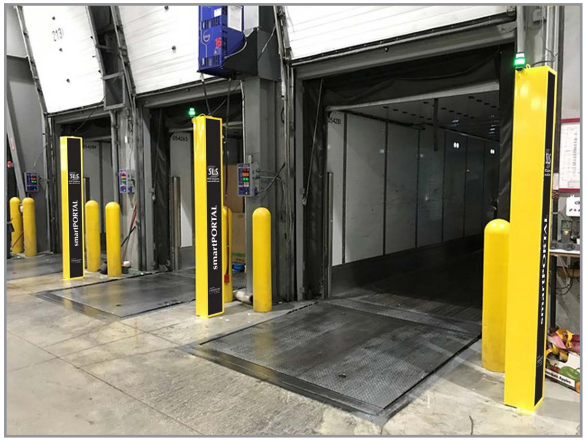
Install Examples



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newave® plug&playPortals Summary

- The wave antenna is unique, it is the only antenna designed specifically for item-level RFID
- The wave enables antenna radiating elements to be embedded into the portal structure which eliminates the need for on-site adjustment
- Precisely accurate with tag read rates exceeding 99%
- Great versatility, offered in numerous form factors, highly adaptable to a wide variety of situations and now provides direction of motion
- Installation is simple and five times faster that a traditional portal. Secure the portal structure, plug it in and it is operational
- Embedded radiators virtually eliminate the need for follow-on maintenance
- Highly Efficient - ROIs have proven to be consistently less than one year with the majority in the 9 month range

Thank You

Any Questions?

www.newaverfid.com

888-677-7343

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