Ultra-Wideband RadWire III Distributed Antenna System

An improved version of the unique RadWire DAS (Distributed Antenna System) that provides low-cost in-building wireless coverage. RadWire™ III replaces radiating coaxial feeders, coaxial cable and individual antennas with a single-wire leaky surface-wave transmission line system that serves as a high-efficiency distributed antenna in the wireless spectrum from 800 MHz to 5.8 GHz. This third-generation system has been optimized for Wi-Fi networks and now features compact ultra-wideband transition cones at both ends of the wire for improved performance.

Components of the third-generation RadWire III Distributed Antenna System installed above the suspended ceiling to provide wireless coverage of the area below. The compact Transition Cone at left connects to a RF Access Point or BDA via an adapter cable and launches a leaky surface wave along the aluminum wire. Wireguides that support the wire are quickly attached to the ceiling-grid channels with screws. The wire is pressed into a slot in the dielectric part of the guide. A second cone at right re-radiates the residual signal power in the surface wave; thereby improving coverage at the far end of the wire.

- **Transition Cone, Near-End** The RF signal is transformed from coaxial cable into a wire-guided surface-wave. The new cone is much smaller in size yet extremely broadband. It covers wireless spectral allocations from 800 MHz to 5.8 GHz.

- **RadWire III Wire** Specially processed 12-gauge lightweight aluminum wire is easily installed and much lower in cost than systems using coaxial cables. The wire serves as a low loss leaky surface-wave transmission line in the wireless frequency bands. An ordinary Crimping Pliers is used to attach and splice the wire.

- **Wireguide** Composite steel and dielectric wireguides attach to the sides of ceiling-grid runners with screws. These guides define the wire-path and elevate the wire away from the ceiling tiles to provide access. Also available are tubular wireguides for turning corners.

- **Transition Cone, Far-End** A second cone at the far end of the wire recovers residual surface-wave signal power and re-radiates it to improve coverage toward the end of the wire run. The coaxial connector on the cone is terminated by a small antenna that is included with the cone.

RadWire™ is now a compact easy-to-install distributed antenna system that offers wider bandwidth and higher radiation efficiency. RadWire™ III enhances in-building coverage not only for Cellular, PCS and 3G applications, but also for the IEEE 802.11Wi-Fi Standards including 2.4 GHz ISM, 5.2 GHz UNII and 5.8 GHz ISM. RadWire may be directly connected as an external antenna to increase the coverage of WLAN Access Points without exceeding the gain limits currently specified by the FCC. Use it to extend Wireless Internet coverage inside offices, colleges, warehouses, factories and “hotspots.”
SUMMARY OF RF SPECIFICATIONS

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<tr>
<td>SMR/Cellular/Page (800 – 960 MHz)</td>
<td>3.0 dB</td>
<td>4.8 dB/100 ft</td>
<td>50 +/-6 dB</td>
<td>2.0:1 – 3.0:1</td>
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<tr>
<td>DCS/PCS/3G (1.7 – 2.1 GHz)</td>
<td>1.4 dB</td>
<td>6.0 dB/100 ft</td>
<td>55 +/-6 dB</td>
<td>1.2:1 – 1.4:1</td>
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<tr>
<td>2.4 GHz ISM</td>
<td>0.4 dB</td>
<td>6.4 dB/100 ft</td>
<td>59 +/-6 dB</td>
<td>1.3:1</td>
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<tr>
<td>5.2 GHz UNII</td>
<td>1.4 dB</td>
<td>10.0 dB/100 ft</td>
<td>65 +/-6 dB</td>
<td>1.4:1</td>
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<tr>
<td>5.8 GHz ISM</td>
<td>1.5 dB</td>
<td>10.8 dB/100 ft</td>
<td>66 +/-6 dB</td>
<td>1.5:1</td>
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Note 1. Loss from coaxial input to surface wave on the wire or visa versa.
Note 2. Attenuation measured without wireguides in open area with transition cones on both ends of wire.
Note 3. Coupling Loss measured with co-polarized receiving test dipole at 20 ft (6 m). Does not include the radiation from the transition cone.
Note 4. Input VSWR measured with Terminated Load at the end of 20-ft run of wire without wireguides.

ELECTRICAL & MECHANICAL SPECIFICATIONS including ACCESSORIES

Transition Cone (TC-WB)
Coaxial Connector: N-type Female
Cone Dia: 4.0 in. max. [10.1 cm]
Cone Axial Length incl. Connector: 7.8 in. [19.8 cm]
Construction: Spun Aluminum
Radome Cover: G-10 Epoxy Laminate
Approximate Weight: 5.0 ozs. [142 gms]
Std. Mounting Bracket: Bendable Steel Strap 1 x 5 in.
Optional Mount: Ceiling-Grid Clip for mounting below the Drop-Ceiling

RadWire III Wire (RW-3)
Matl: Aluminum
Outside Dia: 0.080 in. [2.0 mm.]
Weight: 0.6 lb/100 ft [8.9 gms/m]
Max. Tension: 10 lbs [4.5 kg]
Spool (RW-3S/50): 50 m. on 5-in dia spool
Spool (RW-3S/250): 250 m. on 5-in dia spool

Universal Wireguide Spacer (WG-3A)
Above Drop-Ceiling Installation
Insulator: 1.0 x 5.0 in 1/8-inch Polycarbonate
Extension Strap: 1.0 x 4.0 in 22 ga. Galv. Steel
Misc. Hardware: Drop-Ceiling Mounting Kit

Ceiling Grid Wireguide (WG-4)
Below Drop-Ceiling Installation
Matl: Clear Polycarbonate Plastic
Size: ½” square base x 2” support rod
Mounting: Double-sided 3M Scotch-Mount Foam Tape

Tubular “Elbow” Wireguide (WG-EL)
Above or Below Drop-Ceiling Installation
Encloses wire to make up to 90-degree arcs.
Matl: Clear Extruded Acrylic Tubing
Size: ¼-in O.D. x 3-ft length
Supports: Quick-Attach Clear Plastic (2)
Mounting: Double-sided Tape or Screws

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