SkyWay-Mobile
Broadband Wireless Solution
Wonderful World of Wireless

The era of ubiquitous communication has arrived. Region by region, country by country and continent by continent, wireless connectivity is being delivered to the people of the world. This fundamental human need to stay connected is being addressed by increasingly more powerful and cost-effective communication devices, delivering always-on connections to the masses. Information, in the form of voice and data, is now at the world’s fingertips.

Solectek Broadband Tradition

For 20 years, Solectek has been at the forefront of this revolution. We have brought concepts, equations and theories from drawing board to product, and from the laboratory to the towertop. Now, in our 20th year, Solectek brings its latest product line, a true broadband, mobile platform, to our customers.
Despite the variety of available BWA systems in the market today, there remains pent-up market demand for a solution which delivers true broadband data and toll-quality voice in a long-range, non Line-of-Sight (NLOS) indoor environment. Further, this solution must be easily scalable and expandable with minimal spectrum cost.

The SkyWay-Mobile system rises to meet these challenges with a single platform. By offering no-compromise performance in network capacity, coverage, and scalability for both voice and data services, SkyWay-Mobile represents an unprecedented value proposition for a new generation of competitive network operators.
4G Mobile High Density Data Service

The SkyWay-Mobile system is capable of true mobile deployments with hand-off capabilities and superior propagation characteristics ideally suited to dense, urban environments. The large capacity of the system is capable of more than 300 broadband/voice subscribers per base station sector. The integrated voice transport protocol is 2-3 times more efficient than VoIP, and can use cost-effective analog phones, if needed. The USB-connected modem device can be used with laptop computers in a nomadic fashion with the operator's coverage area.
Rural Broadband Service

Rural areas are characterized by sparse population covering a large land area. This low density subscriber base makes it impractical to deploy traditional, short-range, base stations. The upfront infrastructure CAPEX associated with the base station hardware and backhaul creates an untenable business model.

The SkyWay-Mobile solution is ideally suited for rural deployments because of its unique, long-distance capability. Specifically, base station deployments using frequencies less than 1GHz can reach subscribers located 20 km away. Further supporting a low density deployment, the SkyWay-Mobile is available with an omnidirectional antenna package, used to provide 360 degree coverage with a single base station. Multiple sectors are only required if and when additional capacity is needed.

Rural broadband deployments often require signal penetration through dense foliage. The SkyWay-Mobile solution operating below 1 GHz is particularly effective in such areas where higher frequency systems are often limited. Indoor deployments even in these settings are possible.
Public Safety Mobile Data

Public safety agencies need data on the go. Police cruisers, ambulances and fire engines are all now equipped with IT equipment which requires broadband, in the field connectivity. These agencies require reliable high speed connections ubiquitously within their coverage area, unhindered by buildings, structures or trees.

The SkyWay-Mobile solution can provide near-ubiquitous coverage in these demanding areas. The mobile police/emergency units can be equipped with a small, terminal device and omni-directional antenna to provide uninterrupted coverage while in the field. The sub 1 GHz operation and handoff capability offers best-in class coverage area.
Largest Coverage Area
The economics behind a carrier's deployment is largely driven by the upfront infrastructure CAPEX that must be amortized over time. This means that minimizing the number of base stations for a given coverage area becomes a key issue in site planning and equipment selection.

The Solectek SkyWay-Mobile solution provides a best-in-class coverage area using the latest smart antennas, powerful amplifier arrays and sub-1GHz operation. The resulting gains boost the coverage radius 8 times more than otherwise achievable by competing systems.

Indoor Coverage
Unlike previous generation systems, the SkyWay-Mobile solution is based on self-provisioning, indoor desktop CPEs with simple “rubber-ducky” antennas. The operator is not burdened with “truck-rolls to get each subscriber running.

Cost-Effective Terminal Devices
The SkyWay-Mobile terminal devices themselves are cost-effective, allowing the fastest payback of customer acquisition costs for operators. The USB companion device provides a direct connection to a computer and can be used in a nomadic fashion with the operator's coverage area. The standard desktop CPE uses features an Ethernet data port and an analog, POTS telephony port. The coverage distance can be extended even further by using an external antenna with the same standard CPE.

Base Station Capacity
The base station delivers a payload capacity of 15 Mbps per 5 MHz spectrum, multiples of today’s 2G/3G services, enabling operators to offer a mix of voice and broadband data services to a large number of subscribers without sacrificing quality. And QoS features allow the administrator to configure various levels of services by customer, traffic and grades of service.

Efficient Voice Protocol
Spectrum and capacity is at a premium in any wireless access systems. As such, the system design must provide as efficient transport mechanism as possible.

The VoIP protocol, while popular in IP-based access systems, is not ideal to deliver voice in a bandwidth-constrained environment. The SkyWay-Mobile system offers a proprietary protocol that is two to three times more efficient than VoIP for carrying voice traffic which translates into more users, calls and data capacity per base station. For those operators with existing VoIP investments, the SkyWay-Mobile system will seamlessly operate with any standard VoIP infrastructure.
The performance of the SkyWay-Mobile solution is derived from a number of latest technology developments with the following specific goals in mind.

- Providing the best-of-class link budget
- Frequency reuse (N=1) for adjacent cell deployment
- Best bit efficiency for high network capacity
- Scalability for capacity and cell expansion

**Smart Antenna Array**
Successful wireless deployments require an ample RF link budget. Typically, the base station antennas are “broadbeam,” covering all subscribers in a sector, simultaneously. The wide area coverage, however, wastes energy as not all subscribers are accessed at the same time. By contrast, a smart, beamforming antenna array directs the RF energy to the intended target subscriber unit on a packet-by-packet basis. The net effect is a significant gain in link budget over standard antennas.

**High Power Amplifier Array**
To boost the link budget further, the smart antenna system is driven by an array of tower-top power amplifiers. Each amplifier element has an output of 2W (33dBm) and together with the smart antenna, enables the Skyway-Mobile system to have a best-in-class, indoor coverage area.

**CD-OFDMA**
The SkyWay-Mobile system implements the latest OFDMA modulation, much like other current generation BWA systems. However, it overlays a CDMA component to address the problem of “signal fading” commonly associated with OFDMA systems. Signal fading problems are usually corrected with strong coding techniques, which add complexity and reduces the data rate of the system. By introducing code spreading, the SkyWay-Mobile system combines the best attributes of both modulation methods for optimal RF signal propagation, even in difficult channel conditions.

**Frequency Options**
The Skyway-Mobile solution is available in multiple frequency bands that range from 400 to 3.3 GHz. The system is currently available in frequency bands including 400, 700, 1800, and 2500 MHz. This wealth of frequency band choices allows the operator to pick a particular frequency band whose characteristics are ideal in terms of RF performance, available licenses and regulatory requirements.
### SPECIFICATIONS

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
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<tbody>
<tr>
<td><strong>Frequency of Operation:</strong></td>
<td>336-344, 400-430, 698-746, 1785-1805, 2150-2180, 2525-2560, 3300-3400 MHz</td>
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<tr>
<td><strong>BTS Payload Throughput Rate:</strong></td>
<td>15 Mbps, 4.8 bps/Hz bit efficiency</td>
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<td><strong>Multiple Access Method:</strong></td>
<td>CD-OFDMA</td>
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<tr>
<td><strong>Modulation:</strong></td>
<td>QPSK, 8PSK, 16QAM, 64QAM</td>
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<tr>
<td><strong>Signal Bandwidth:</strong></td>
<td>1, 2, 3, 4 or 5 MHz, user configurable</td>
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<tr>
<td><strong>Duplexing:</strong></td>
<td>TDD, with configurable up/down ratios</td>
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<tr>
<td><strong>RF Power:</strong></td>
<td>2W (33dBm) per amplifier at RF port</td>
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<tr>
<td><strong>Smart Antenna:</strong></td>
<td>8 element smart antenna array, Omni / Sectoral</td>
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<tr>
<td><strong>Link Budget:</strong></td>
<td>&gt; 163 dB</td>
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<tr>
<td><strong>Handover:</strong></td>
<td>Fast handover (Make before Break)</td>
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<tr>
<td><strong>QoS (Quality of Service):</strong></td>
<td>3 control class – Real Time, High, Best Effort</td>
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<tr>
<td><strong>GoS (Grade of Service):</strong></td>
<td>8 Service Classes</td>
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<tr>
<td><strong>Dynamic Modulation:</strong></td>
<td>Switching based on SNR figures</td>
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<td><strong>Frequency Reuse:</strong></td>
<td>N=1 for adjacent cell deployment</td>
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About Solectek

Founded in 1989, Solectek has long been a leader in the broadband wireless networking industry. Headquartered in San Diego with offices/partners worldwide, Solectek has installations in over 90 countries. Solectek manufactures a full line of broadband wireless connectivity products from last-mile access, video surveillance transport to high capacity backhaul up to 1 Gbps in 400 MHz to 70 GHz frequency bands. For more information, visit www.solectek.com.

Other Products from Solectek

• 3.5 / 3.65 GHz Fixed WiMAX
• 5 GHz High Capacity PTP Links
• 5 GHz Multipoint for Last Mile Access
• 4.9 GHz Multipoint for Video Surveillance
• 6 - 26 GHz Licensed Microwave Backhaul
• 70 GHz Gigabit Ethernet Link