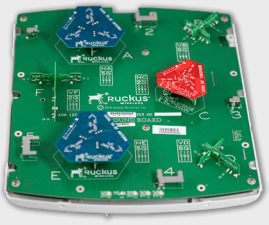
BEAMFLEX®

Smart antenna system



FEATURES

- Multiple directional high-gain elements
- Real-time optimization system
- Works with Wi-Fi 6
- Thousands of antenna patterns that are optimized via patented software to ensure the best path to the client
- Compatible with 802.11a/b/g/n networks and clients
- Continuous learning based on inputs from network layers 0 through 7
- On-the-fly antenna reconfiguration and transmission policy management per packet, per flow, per receiving device
- Up to 6 dBi signal gain and 15 dB interference mitigation

BENEFITS

- Requires fewer APs to deliver a higher capacity coverage over a greater area—delivering more reliable client connectivity
- Has a self-healing, self-optimizing antenna system proven in more than 3.5 million installations
- Mitigates interference in a high-density client and AP environment
- Extends Wi-Fi range and coverage by focusing Wi-Fi signals toward client
- Maximizes AP and client performance
- Eliminates dead spots
- Provides better reception and transmission for handheld clients that are both hard to hear and constantly change direction

The industry's only smart antenna system that delivers stable connectivity and higher performance

BeamFlex® is a combination of multiple high-gain polarized antenna elements and patented software algorithms that are combined in real time to offer an exponential increase in performance. With up to 21 high-gain, directional antenna elements, a BeamFlex smart antenna offers more than 4,200 unique antenna patterns to optimize the reception of a given client.

The RUCKUS® adaptive antenna technology also includes adaptive polarization diversity—further increasing signal gain. Translating to better reception and transmission, polarization diversity is particularly advantageous for handheld devices that are hard to hear and constantly change direction.

Completely standards based, and Wi-Fi 6, the BeamFlex smart antenna system works with any off-the-shelf 802.11a/b/g/n chipset and is integrated into every RUCKUS smart Wi-Fi access point.

How it works

Unlike omnidirectional antennas that radiate signals in all directions, BeamFlex directs transmit energy toward the best path to the receiving device. And, unlike fixed-position directional antennas, BeamFlex dynamically configures and re-configures its antenna pattern to achieve focused coverage with directional performance within a given environment—thus increasing signal gain.

The BeamFlex smart antenna is controlled by an optimization engine that automatically reconfigures the antenna patterns on a packet-by-packet basis—selecting the best performing and highest quality signal path and optimum data rate for each receiving device.

The expert software system within BeamFlex extracts important information from all 802.11 packets received, such as the sender's performance, the optimum data rate, RSSI, error rates and approximate location. It then ranks the optimum antenna patterns for each communicating device—keeping track of the best performing signal path at any time for any given client. The resulting antenna pattern shows RF energy directed toward the client, thus increasing performance while mitigating interference by removing energy where it does not need to go for each packet transmitted.

What's the big deal?

Consistent performance

By continuously steering transmissions to high-quality signal paths, BeamFlex maximizes and sustains Wi-Fi transmission speeds while minimizing transmission errors. BeamFlex stabilizes wireless network performance to enable consistent throughput at range.

Extended range

And, because BeamFlex enables high-gain, directional Wi-Fi signals to clients, it delivers up to a four-fold increase in range over any other Wi-Fi access point.

Stable connections

Through antenna diversity and dynamic adaptation, BeamFlex ensures that the best performing and most reliable signal path is used at any given time—thereby minimizing erratic Wi-Fi behavior such as dropped connections.

Interference mitigation

BeamFlex is able to select antenna patterns that focus RF energy away from the direction of interference—thereby attenuating noise to the receiving station. This enables remarkable improvements in signal gain while, at the same time, reducing interference or contention among other APs. Using these interference mitigation techniques, a single ZoneFlex AP can realize up to 6 dBi in signal gain and 15 dB in interference mitigation. An interference mitigation algorithm enables the BeamFlex software to detect the direction of interference from, for example, a neighboring network, a microwave oven, or a nearby Bluetooth device. In response, BeamFlex is able to select antenna patterns that direct energy away from the direction of interference—attenuating noise to the receiving station.

Better RF neighbor

Because BeamFlex only focuses RF energy where it's needed, it interferes less with other Wi-Fi access points and clients.

Automatic adaptation

Dynamically configuring the Wi-Fi "beam" hundreds of times each second, BeamFlex can adapt in real time to environmental changes—steering signals around obstacles, interference and other hazards that would otherwise negatively affect performance.

BeamFlex effectively allows each RUCKUS AP to deliver high-gain directional Wi-Fi signals in 360 degrees while simultaneously minimizing noise to nearby networks, devices and other APs.

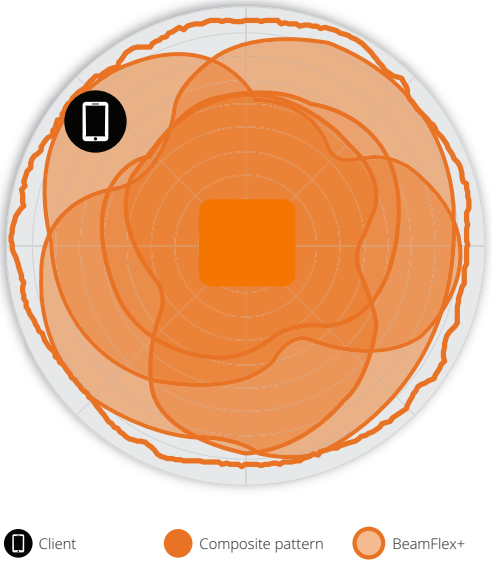


Figure 1. Example of BeamFlex+ pattern

BeamFlex not only focuses RF energy where it's needed but also mitigates interference coming from other directions. This ensures that the highest possible PHY rate is used and that the highest possible throughput is achieved for all clients.

www.ruckusnetworks.com

Visit our website or contact your local RUCKUS representative for more information.

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