COMMSCOPE®

Three Degrees. Optimized Capacity.

NEXT GENERATION

BASE STATION ANTENNA SYSTEMS

Welcome to three degrees of freedom: Free yourself with SmartBeam® Antennas

The need: Speed. Agility. Precision. The challenge: how can you get more?

There is a solution. An evolution. A breakthrough in Agile Network technology that will put you ahead of the demands of wireless data service.

SmartBeam®

SmartBeam® Antennas from Andrew Solutions

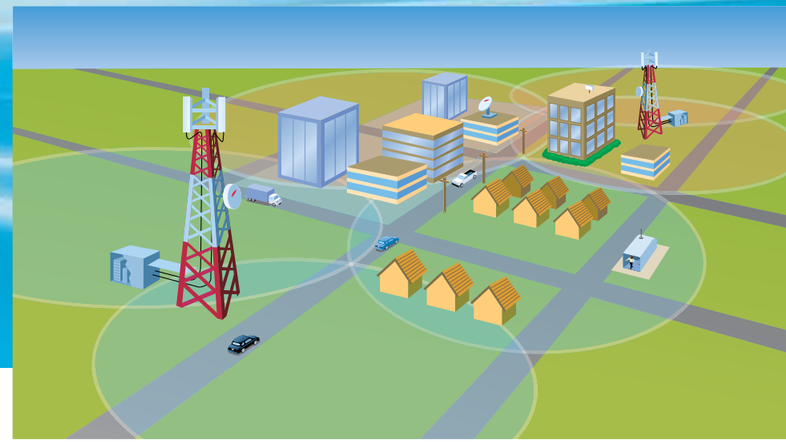
- Improve RF quality with tighter RF containment, more precise pattern control, and superior suppression of intermodulation.
- Reduce costs by increasing capacity efficiency and eliminating many site visits.
- Manage typical traffic peaks such as business, residential, and rush hours.
- The three-way SmartBeam Antenna allows radio planners to optimize the beamwidth, a revolution in network planning that results in better network quality.

Capacity tailored to fit where and when you need it most

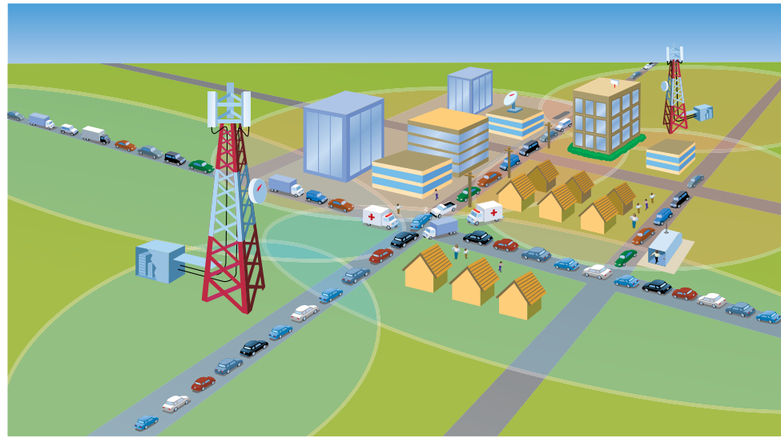
- Flexible optimization.
- Meet capacity demand during specified traffic peaks.
- Provide cost-efficient load balancing.

Engineered for agility

- Andrew is the intellectual property holder of RET technology.
- Industry leader for over 70 years in innovative expertise.
- 1°, 2°, and 3° of freedom and control.
- Next Generation Actuator (NGA™) provides high precision and the reliability of Swiss manufacturing.
- High-reliability motors are approved for use in avionics and automobile industries.

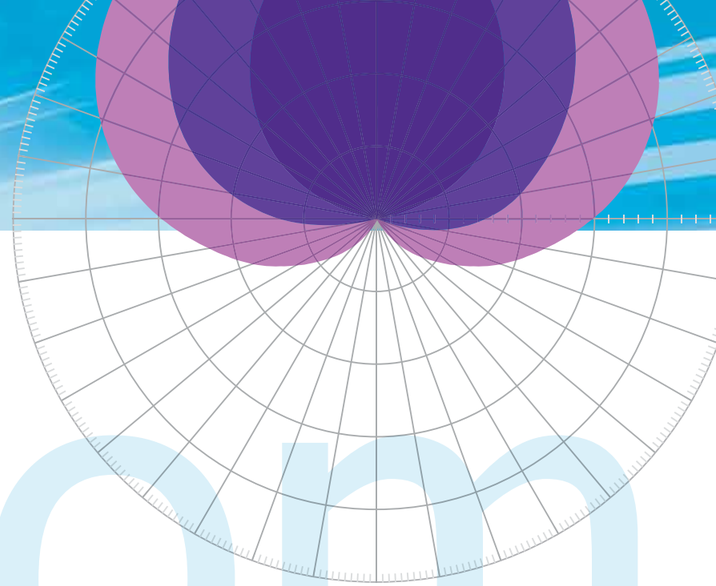


During the day, SmartBeam Solutions allow your network to focus beams on business areas.



During rush hour, SmartBeam Solutions allow your network to focus beams on highways.

SmartBeam® Free Yourself



Freedom

Improve network quality with beamwidth optimization, a new RF parameter

- Use the optimum azimuth beamwidth for each sector for best signal-to-noise ratio in the network, i.e., 50°
- Free your network from fixed beamwidth limitations of standard antennas that typically come in fixed 35°, 65°, or 90° settings
- Optimize configurations to fit perfectly inside a sector to provide higher network quality

Reduce OPEX by eliminating many unnecessary site visits

- Gain convenient remote, three-way beam control from the office
- Make adjustments quickly, independent of weather conditions
- Eliminate site access issues, paperwork, and trouble tickets
- Reduce network maintenance and optimization costs

Reduce CAPEX and increase capacity and efficiency with fewer new sites

- Load balance capacity to surrounding areas based on predictable traffic requirements
- Shift traffic from overloaded cells to under utilized sectors by redirecting and widening/narrowing the antenna beam
- Focus beamwidth in your network more effectively to use existing capacity with the highest efficiency; ideal for redirecting network capacity to business areas versus residential during the day or increasing capacity during stadium events
- Delay expensive new radio deployments and site builds

Ensure configuration changes quickly and precisely

- Eliminate the need for manual mechanical adjustments
- Ensure proper, exact alignment in seconds
- Eliminate installation alignment errors with our Next Generation Actuator™—it's factory-installed under the radome with the highest-quality to ensure exact, repeatable installation and alignment
- Cover for neighbor sites—when one sector goes down, neighbor sector antennas can redirect and widen their beam in minutes

Reduce inventory costs

- Use one flexible SmartBeam Antenna instead of a wide range of antenna types
- Simplify warehouse management, increase warehouse availability of antennas, and reduce rollout delays
- Integrate SmartBeam with your current antenna systems

Prevent optimization implementation issues

- Coordinate remote optimization for a whole network in less than five minutes
- Execute configuration changes for all sites in parallel at the same time to eliminate time delays
- Eliminate temporary coverage holes or interference as part of standard sequential optimization
- Schedule automatic optimization for the night with lowest network traffic

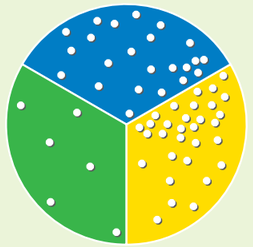
Generate less green house gases

Optimize 200 sites and you can prevent the generation of approximately 50 tons of carbon dioxide and save 4,500 gallons of gas

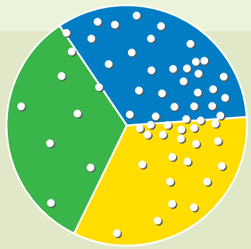
How it Works

SmartBeam Antennas: Intelligent from the inside out

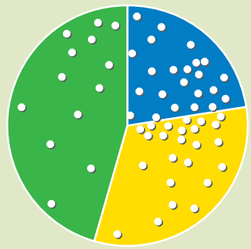
With three-way control and the Next Generation Actuator™, this antenna solution is designed and built with intelligence from the inside out. SmartBeam integrates seamlessly with your current network and uses the latest technology to simplify and enhance antenna networks. Each antenna has only one AISG input connector and one output connector for daisy-chaining to the next antenna. Everything else is under the radome.



Overloaded and under utilized sectors



Shifting traffic from overloaded (yellow) to under utilized (green) cells by redirecting the beams



Maximize capacity efficiency by widening the beam of under utilized sectors (green) and narrowing the beams of overloaded sectors (yellow/blue)

SmartBeam Antennas offer three options for flexibility and freedom:

1° of Freedom

The beam can be adjusted vertically, allowing for improvements in coverage and interference optimization.

2° of Freedom

The beam can be adjusted vertically and +/30° horizontally, enabling great improvements in network quality.

3° of Freedom

In addition to vertical and horizontal beam adjustments, the width of the beam can be remotely adjusted from 35° to 105°. This allows dynamic load balancing, which transfers traffic from overloaded cells to under utilized sectors—delaying or preventing the need for new radio deployments or site builds. With 3° of freedom, RF engineers are free from beamwidth restriction, enabling an evolution in network planning resulting in better network quality and the highest capacity and efficiency.

Load Balance Traffic Distribution

Ideally, each sector would have the same amount of traffic. In reality, traffic flow is dynamic, so distribution is unbalanced—a key cause of capacity inefficiency. That's where SmartBeam Systems can help. SmartBeam helps balance traffic over all sectors, avoid peaks, and improve capacity efficiency by:

- Redirecting and widening/narrowing the beam
- Shifting traffic from overloaded to under utilized sectors
- Evenly distributing traffic to all sectors
- Significantly reducing sector overload
- Maximizing sector capacity

Next Generation Actuator™: Setting a new industry standard for reliability and simplicity of operation in harsh environments

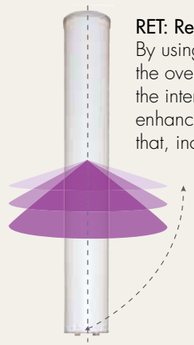
The Next Generation Actuator™: Setting a new industry standard for reliability and simplicity of operation in harsh environments.

SmartBeam Antennas have integrated Next Generation Actuators (NGAs) under the radome. These actuators are made in Switzerland on a fully automated assembly line with high precision laser quality control. With an annual production of multiple millions for over a decade, these proven 99.999% reliability motors have given the automobile and avionic industry the highest level of durability and precision even in extreme environments.

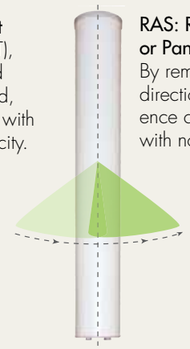
By having the actuators factory-installed and integrated under the radome:

- Installation is simplified and installation issues are eliminated.
- Actuators are well protected.
- Visual appearance of the antenna is improved and zoning procedures simplified.

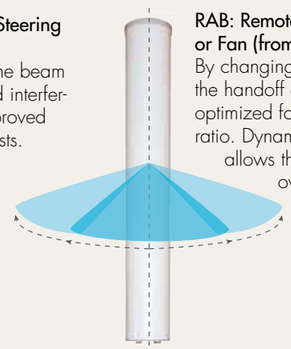
RET, RAS, and RAB: Capture the full power of three-degree technology



RET: Remote Electrical Tilt
By using beam tilting (RET), the overlapping area and the interference is reduced, enhancing the SNR, and with that, increasing the capacity.



RAS: Remote Azimuth Steering or Pan (±30°)
By remotely changing the beam direction, coverage and interference can be further improved with no optimization costs.

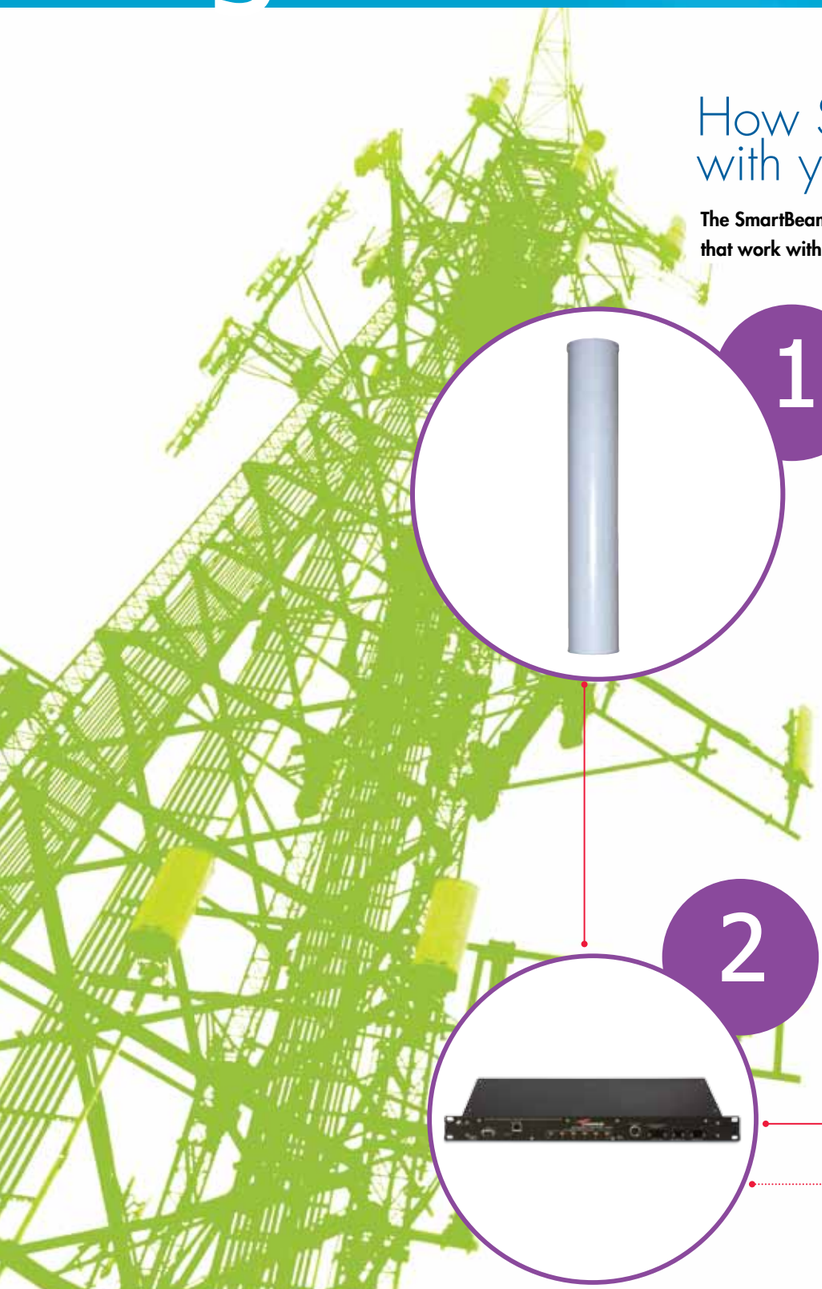


RAB: Remote Azimuth Beamwidth or Fan (from 35° to 105°)
By changing the width of the beam, the handoff area can be perfectly optimized for optimal signal to noise ratio. Dynamic load balancing allows the transfer of traffic from overloaded cells to under utilized sectors.

Agile Network Solution

How SmartBeam works with your network

The SmartBeam solution consists of three key components that work with your network.



1

SmartBeam Antennas

- 1° of Freedom:
  Remote Electrical Tilt
- 2° of Freedom:
  Remote Electrical Tilt
  Remote Azimuth Steering or Pan
- 3° of Freedom:
  Remote Electrical Tilt
  Remote Azimuth Steering or Pan
  Remote Azimuth Beamwidth or Fan

2

Teletilt® Controller

The ATC300-1000 controller allows remote management of RET antennas, SmartBeam Antennas, and AISG Tower Mounted Amplifiers (TMAs).

wired or wireless option via modem

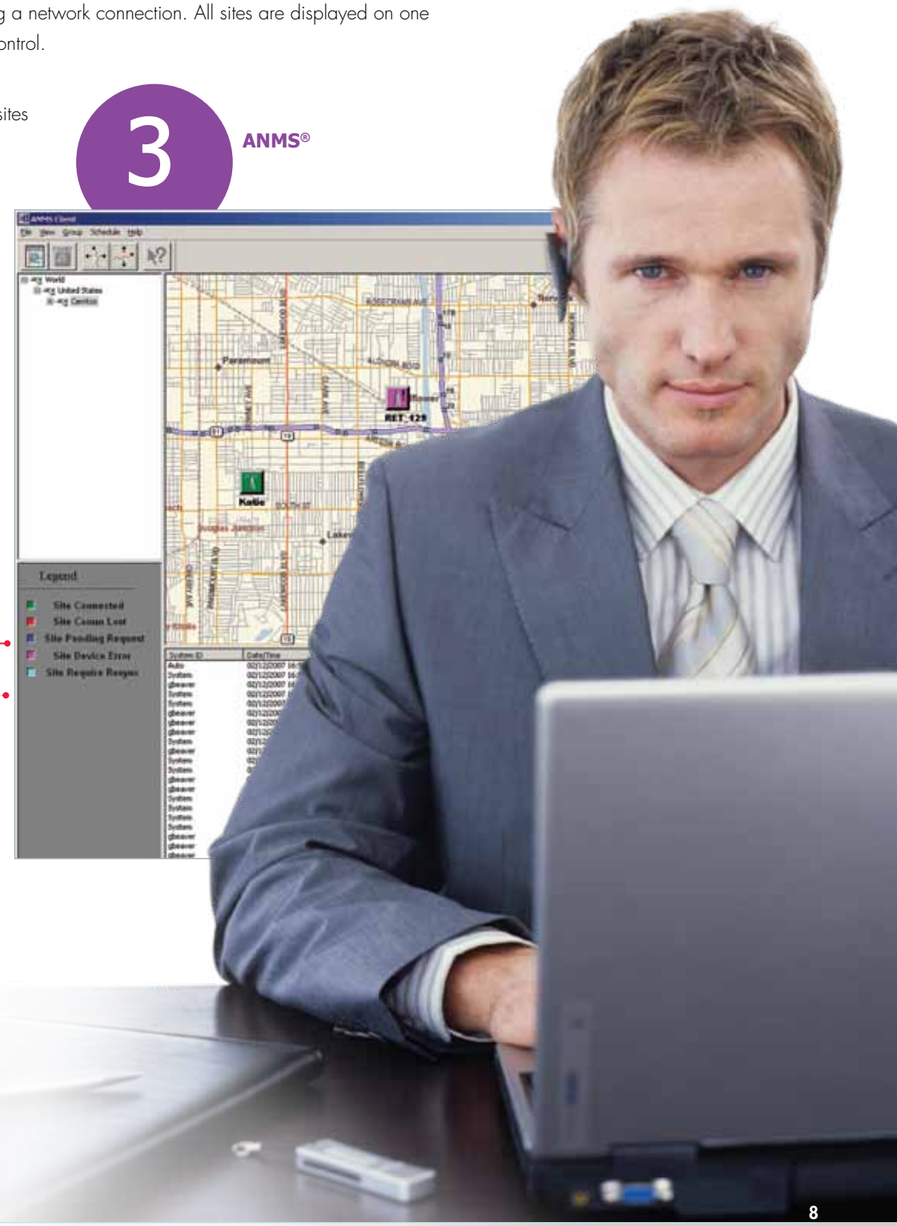
Powerful Antenna Network Management System (ANMS) gives you one view of all sites

ANMS connects to each site by using a network connection. All sites are displayed on one screen for full network visibility and control.

- Full three-way beam control
- Geographical map display of all sites
- Easy orientation
- Zooming function
- One view of site status/alarm conditions by color
- Ability to schedule network modifications to achieve the most efficient changes

3

ANMS®

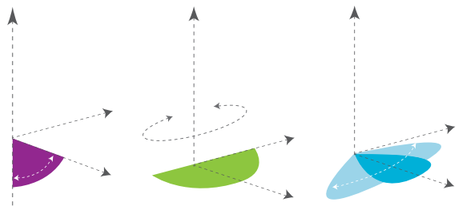


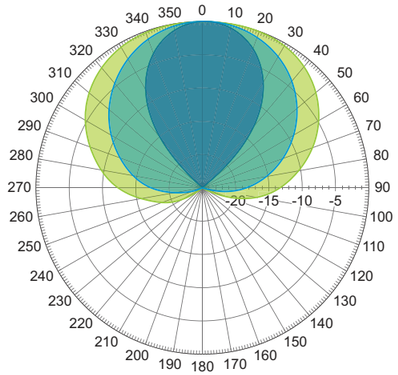
For more information, visit commscope.com/products/antennas/SmartBeam

SmartBeam 3-Way

- RET, RAS, and RAB capability (Tilt, Pan, and Fan)
- Adjustable electrical downtilt 2–10°, azimuth boresite ± 30°, and horizontal beamwidth 35–105°
- Internal AISG actuators are fully compatible with Teletilt® RET system
- 1710–2180 MHz

Model	Tilt degrees	Azimuth degrees	Beamwidth degrees	Gain dBi
SBH-3DA	2–10	±30	35–105	14–19.2

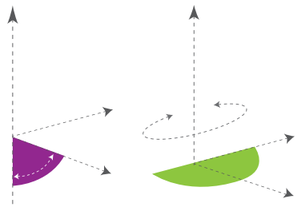


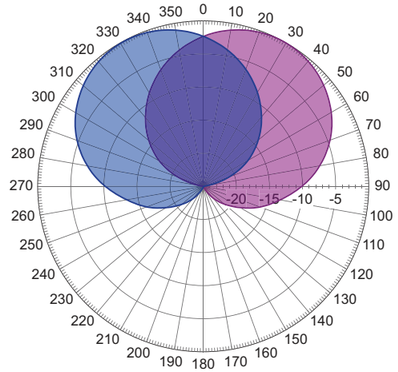


SmartBeam 2-Way

- RET and RAS capability (Tilt and Pan)
- Adjustable electrical downtilt and azimuth boresite ± 30°
- Internal AISG actuators are fully compatible with Teletilt® RET system
- 1710–2180 MHz

Model	Tilt degrees	Azimuth degrees	Beamwidth degrees	Gain dBi
SBH-2D6516	0–10	±30	65	17.5
SBH-2D3318	0–10	±30	33	20.1

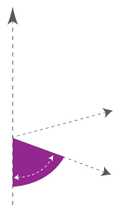


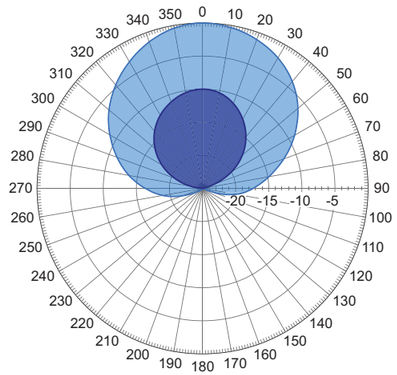


SmartBeam 1-Way

- RET capability (Tilt)
- Adjustable electrical downtilt
- Internal AISG actuators are fully compatible with Teletilt® RET system

Model	Tilt degrees	Beamwidth degrees	Gain dBi	Frequency MHz
SBH-1D3319DS	0–9	33	20.7	1710–2180
SBHH-1D3817TB	2x0–10	2x38	2x19.8	2x1710–2180
SBH-1D6516DS	0–10	65	18	1710–2180
SBHH-1D6516DS	2x0–10	2x65	2x18	2x1710–2180
SBNH-1D4545A	2–17/0–9	45/45	15.5/18.3	698–896/1710–2180
SBNH-1D6565A	0–18/0–10	65/65	13.9/16.9	698–896/1710–2180
SBNH-1D6565B	0–10/0–6	65/65	15.2/18.4	698–896/1710–2180
SBNH-1D6565C	0–11/0–7	65/65	16.4/18.0	698–896/1710–2180
SBNH-1D8585B	0–10/0–6	85/85	14.4/17.3	698–896/1710–2180
SBNH-1D8585C	0–9/0–6	85/85	15.4/17.3	698–896/1710–2180





We're proud to be a part of your network's story.

Here at CommScope, we embrace our role as a trusted resource, partner, and facilitator. We create the infrastructure that connects the world and evolves with every advance in technology. By investing all of our capabilities, resources, relationships, and products into your toughest challenges, we continue our long history of solving problems together—paving the way for new ideas and fresh ways of thinking. We're a trusted resource and partner around the world because we're invested in you: your people, your networks, your success. It inspires us to build relationships and infrastructure… connect people and technologies across protocols, oceans, and time zones…and share what we learn along the way.

This is our promise to you.
This is CommScope.

COMMSCOPE®

www.commscope.com

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

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