Casa Systems’ end-to-end small cell solution is designed to address coverage and capacity needs for today’s mobile subscribers and use cases. Casa’s Apex Radio Access Network (RAN) solutions include a range of small cells: Lifestyle, Enterprise, Strand and Micro small - to meet service providers’ many different requirements.

The Apex Strand takes advantage of existing cable strand to cost-effectively support two LTE carriers. Several LTE-FDD and LTE-TDD licensed bands as well as 3.5GHz CBRS bands are supported.

Both Mobile Service Providers and MSOs can take advantage of the Apex Strand. The solution helps solve the powering, backhaul and site issues that have plagued large scale, small cell deployments for many years. By using the cable strand, small cell backhaul can be supported with DOCSIS or PON while power is provided by the Hybrid Fiber Coax (HFC) plant.

To develop the Apex Strand, Casa leveraged its experience developing, testing and deploying strand mounted Distributed Access Architecture (DAA) nodes for MSOs. As a leader in the cable broadband market, Casa’s DOCSIS knowledge, experience with cable strand and Outside Plant Equipment deployments, provide a significant technology advantage.

Casa’s Apex Strand can be supported by the incumbent EPC, however Casa can also provide an overlay virtualized small cell core, including HeNB and security gateways which provide the scale, intelligence, and deployment flexibility needed for small cell growth.
# Technical Specifications

## GENERAL
- **Antennas**: 2 integrated directional panel antennas or 1 omni directional antenna per LTE carrier
- **EIRP (per sector)**: Up to 42 dBm (16W) per carrier (configuration dependent)
- **LTE carriers per sector**: 2
- **RF Ports**: 4 (Tx & Rx), 1 RF Sniffer Port, 1 GPS Port and 2 external antenna ports
- **Synchronization**: GPS, IEEE 1588v2 timing
- **Power Source**: HFC Power 42-90 VAC Quasi Sine 50-60 Hz
- **Backhaul Options**: DOCSIS 3.0, DOCSIS 3.1 and PON

## PHYSICAL AND ENVIRONMENTAL
- **Operational Temperature**: -40ºC to 60ºC, Humidity <95% non condensing
- **Protection**: IP67
- **Dimensions**: 20 x 8 x 6.8 inches (LxHxD), 508 x 203 x 173 mm
- **Weight**: 25 lb (11.3 Kg)
- **Nominal Power Consumption (W)**: 75W (configuration dependent)
- **Omni Antenna**: Optional

## ANTENNA
- **Integrated Antenna Gain**: 9.5 dBi for integrated directional panel antennas
- **Radiation Panel Azimuth**: Directional panel antenna - different antenna specs may be supported upon request
- **Beamwidth Elevation**: 70 degrees (integrated directional panel antennas)
- **Beamwidth LTE**: 35 degrees (integrated directional panel antennas)

## FREQUENCY BANDS
- **Frequencies**: 7, 38, 41 and 48 - additional bands and band combinations upon request

## CAPACITY
- **LTE Carriers**: 2 Carriers
- **MIMO Configuration**: 2x2 MIMO DL, UL Rx diversity (2Tx / 2Rx)
- **Throughput DL / UL Max. for TDD**: 240 / 30 Mbps with CA enabled
- **Throughput DL / UL Max for FDD**: 300 / 50 Mbps (64 QAM modulation), 400 / 75 Mbps (256 QAM modulation) FDD mode with CA enabled
- **Max Users**: Max. scheduled users / TTI: 16; max RRC connected users: 64
- **Carrier Aggregation Mode**: Supported
- **Counters and Alarms**: Over 500 performance counters; over 50 alarms

## RADIO ACCESS TECHNOLOGY
- **3GPP Release**: 12
## Technical Specifications

<table>
<thead>
<tr>
<th>Axyom Element Management System (AeMS)</th>
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<tr>
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<td>• TR-069 Auto-Configuration Server (with TR-196v2 and TR-181 Data Model Support)</td>
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<td>• KPI Management standard KPI definition (TS 32.453), custom KPI definition support</td>
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<td>• Fault Management</td>
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<td>• H(e)MS small cell management system functions (3GPP TS 32.592 and TS 32.593)</td>
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<td>• HTTP REST Real time monitoring interface</td>
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</table>

**SON / Plug and Play**

- Self-configuration and optimization
- Automatic Neighbor Relation (ANR)
- Physical Cell Identity (PCI) optimization
- S1/X2 autoconfiguration
- Mobility robustness optimization (MRO)
- RACH optimization
- Self Healing

## Supported Services

Supported services include:

- SON: Hybrid SON support with dSON and cSON; dSON agent can work with or without cSON and supports using a real-time interface through X2 or TR-069; SON macro integration supported through X2-GW, X2-Proxy or direct connection
- TR-069: TR-069 agent supports TR-196v2 and TR-181 data models