

## Apex Compact 4G Small Cell Coverage / Capacity + Monetization



Casa Systems' end-to-end small cell solution is designed to address the need for mobile network coverage and capacity for today's subscribers while readying the network for 5G. Casa's solutions include a range of Apex small cells – indoor and outdoor, residential and enterprise, multi-standard and 4G only - to address multiple use cases. Casa's Axyom Small Cell Gateways with integrated security also act as X2 gateways and provide the scale, intelligence, and deployment flexibility needed for mobile edge computing and 5G ultra-fast, ultra-dense and ultra-low latency use cases. Deployable at the edge on a 1RU / 2RU COTS x86 server, or as independently scalable control and service forwarding elements at a centralized location, Casa's mobile access solutions enable a range of new services, including location insight, Private LTE, and distributed security for the IoT.

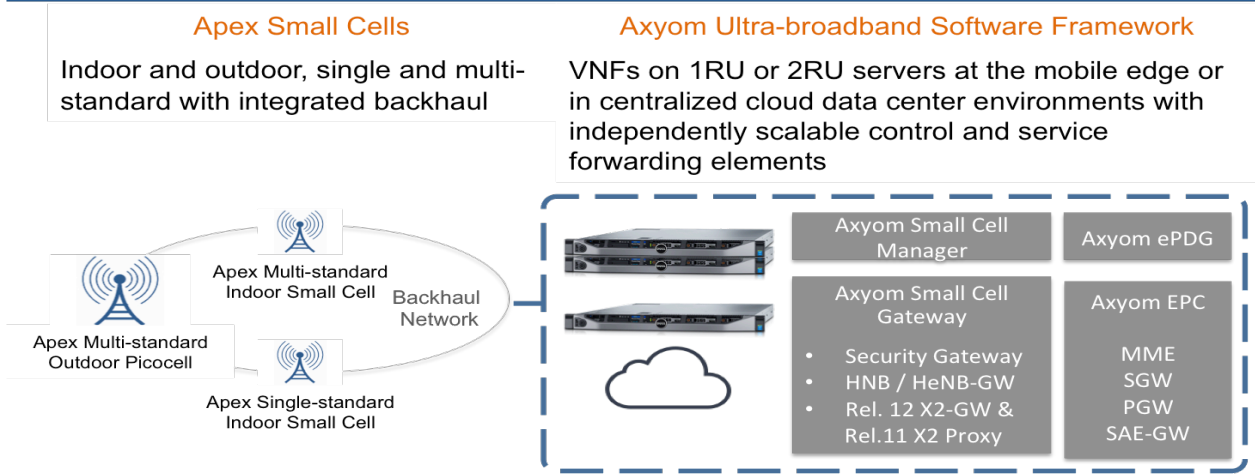
The Axyom Small Cell Manager provides H(e)MS and real-time SON functions that reduce operational costs, speed time to market, and optimize the customer experience. Network data becomes actionable intelligence and is leveraged by algorithms for self-configuration, self-optimization and self-healing while an advanced GUI gives control over all small cell parameters and over 100KPIs. Zero-touch plug-and-play provisioning and self-organizing features combine to minimize service provider installation costs. The unified management framework includes Fault and Performance Management from a shared data store, a Syslog server and a SmallCell Forum FAPI-compliant SON-API for northbound integration with external SON servers to facilitate integration and hand-over with macro-RAN environments.

Casa Systems' family of Apex small cells are a key component of Casa's end-to-end mobile network solution. The Apex family includes the Compact 4G small cell which is designed for small office and residential environments. The Compact 4G leverages Casa Systems' in-house designed L2/L3 Protocol Stack software, designed for the challenges of dense heterogeneous environments.

### Key Features

- High performance 3GPP LTE Protocol Stack
- Up to 16 active users, 4 scheduled users / TTI
- MIMO 2x2 and Air Sniffer RF interfaces
- Self-configuration based on TR-069
- ARNF algorithms for self-managing and optimal neighbor list
- High efficiency multi-agent platform for SON and O&M
- Advanced LTE scheduler including QoS aware scheduling and frequency selective scheduling
- Support of frequency dynamic ICIC and MRO

## Casa Systems' End-to-end Small Cell and Mobile Edge Computing Solution



Delivering high performance with minimum power consumption and smooth integration with existing RAN assets, the Compact 4G is ideally suited for network densification while also supporting CSFB, VoLTE, and QoS based services. Casa's Open API Framework includes, e.g., geo-location APIs that leverage zonal presence and traffic flow information available from the Compact 4G to enable new services.

Casa Systems' mobile broadband solutions are engineered for high performance, strong security, ease of integration, and most of all, flexibility. Whether seeking small cells to densify an existing network and add capacity, or to profit from new services like Private LTE or location insight services or security-as-a-service, service providers will find a comprehensive and innovative answer with Casa.

### Technical Specifications

<b>Radio Access Technology Support</b>	LTE-FDD: R9
<b>Max. Transmit Power</b>	20 dBm
<b>Max. Power Output</b>	Up to 100 mW per radio
<b>Max. Data Throughput</b>	LTE-FDD: 150 Mbps DL / 50 Mbps UL
<b>Max. Simultaneous Active Users</b>	16 LTE-FDD users LTE_FDD: 4 DL/DU UE's scheduled per TTI
<b>Band Support</b>	LTE-FDD band: 7. HW ready support for additional bands / frequencies
<b>Antennas</b>	3 omnidirectional internal antennas
<b>Antenna Configuration</b>	LTE-FDD 2x2 MIMO DL, UL Rx diversity (2Tx/2Rx)
<b>Backhaul Options</b>	10/100/100 Ethernet
<b>Interfaces</b>	LTE: S1-U, S1-MME, X2

## Technical Specifications

<b>Advanced Feature Support</b>	<p>Access control: open, hybrid or closed access</p> <p>Advanced LTE scheduler with QoS aware scheduling and frequency selective scheduling</p> <p>Standard IOI, RNTP and HII messages over X2 adapted to the HeNB needs for Interference Management</p> <p>Support of frequency dynamic ICIC and MRO</p> <p>Support of CSFB, VoLTE, ViLTE and QoS based services</p> <p>LTE and IRAT mobility support</p>
<b>Security Features</b>	<p>IPSEC: AES, 3DES</p> <p>PKI: IKEv2 key management, certificate-based authentication (x.509)</p> <p>Secure boot</p>
<b>SON</b>	<p>Self-optimization</p> <ul style="list-style-type: none"> <li>• Mobility load balancing (MLB)</li> <li>• Mobility robustness optimization (MRO)</li> <li>• Capacity and coverage optimization (CCO)</li> <li>• RACH organization</li> <li>• Energy saving</li> </ul> <p>Self-healing</p> <ul style="list-style-type: none"> <li>• Automatic cell outage detection</li> <li>• Software recovery</li> </ul> <p>Self-configuration</p> <ul style="list-style-type: none"> <li>• Automatic neighbor relation (ARO)</li> <li>• Automatic physical cell identity (PCI)</li> <li>• Dynamic S1-MME configuration</li> <li>• Radio environment management (REM)</li> <li>• Frequency synchronization</li> <li>• Dynamic X2 configuration</li> <li>• Automatic primary scrambling code (PSC)</li> <li>• Automatic LAC (location area code) / RAC (routing area code)</li> <li>• Common pilot channel (CPICH) max power setting</li> <li>• Automatic UARFCN</li> </ul>
<b>Dimensions</b>	216mm x 130mm x 23mm
<b>Weight</b>	0.35Kg
<b>Power</b>	< 12W at full capacity