



End-to-End 4G Solutions

for Mobile BWA, WiMAX & LTE

Founded in 1997, **Runcom Technologies** develops, manufactures and markets superior end-to-end 4G solutions including fixed and mobile terminals, base stations (BS), ASN gateways and network operating centers (NOC) that target the emerging 4G market. Their innovative solutions enable the delivery of enhanced communications services to cellular phones and other mobile and fixed devices. Runcom also provides state-of-the-art silicon solutions to OEMs and ODMs worldwide.

Runcom is the recognized pioneer of OFDMA® (Orthogonal Frequency Division Multiple Access) NLOS (Non-Line-of-Sight) technology, which has been adopted by ETSI for wireless telecom applications, LTE and by the WiMAX Forum® for its IEEE 802.16e standard.

INFRASTRUCTURE

RNU4000BS Base Station



Runcom's RNU4000BS BS is compliant with IEEE 802.16e Wave 2 profile and WiMAX forum requirements for MAN, broadband wireless and mobile networks. The BS performs all the required capabilities of the mobile BS next-generation such as: WiMAX Modem PHY and MAC functions, SNMP-based protocol with an advanced alarm and event management system, including full support of the latest R6 interface over GRE tunneling towards the ASN-GW (Access Service Network-Gateway).

The RNU4000BS unit supports 4x4 MIMO antennas and can cover either one, two or four sectors using a single unit with 4x1 watt antenna output. Using these options, the operator can choose between having a coverage-based and a capacity-based deployment. As a result, significant OPEX and CAPEX savings are achieved by reducing the required number of sites requisitioned to provide high-quality tailored performance for a given area.

RN-ASN-SG-X Runcom ASN Gateway



RN-ASN-SG, Runcom ASN gateway is a key component in Runcom's end-to-end solution, providing a feature-rich, cost-effective and modular solution specifically for public, nationwide wireless 802.16e networks.

The ASN gateway includes a set of core technology modules that have been developed by Runcom as part of an integrated solution, or as a standalone product. RN-ASN-SG terminates the network interfaces from the base stations via the standard WiMAX R6 interface, controls users sessions (authentication, authorization accounting and security), and handles routing and mobility.

The ASN gateway provides a value-added service layer on top of its standard WiMAX support. It provides a unique and cost-effective provisioning with interactive communications through existing portals. It manages user sessions with dynamic service profiles implemented on an individual basis and includes a wide service portfolio (QoS) to be offered by the wireless operators to their subscribers.

RN-NOC-XXX Runcom Network Operating Center



The Runcom NOC (Network Operation Center) solution addresses the ASN interface and a wide array of Internet services offered by the mobile WiMAX operator. The NOC provides a flexible connectivity for residential and mobile subscribers. It also provides secure and safe service for SOHO, SME and corporate customers.

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The NOC provides a variety of services including VoIP, VOD, IPTV, email, anti-spam, anti-virus, web browsing, location-based service and more.

Runcom NOC's proven-solution is fully compliant with existing related standards (such as 802.16e) and related RFCs. Runcom's NOC includes all required elements such as: AAA radius server, a billing system, management (CRM, NMS), VAS, ASN-GW, firewall, operator portal, DHCP server, DNS server, backbone switches and core routers.

RN-CP-NOC Runcom Compact Network Operating Center



RN-CP-NOC, the Runcom Compact NOC is a cost-effective system that provides a full network solution within one box for wireless cells. Based on Runcom's distributed ASN service gateway hardware, it provides a feature-rich, cost-effective and modular solution specifically for small 802.16e wireless networks. The compact NOC includes ASN gateway functionality, IP allocation service, CPE authentication capabilities and WiMAX service configuration to allow full network operation without additional NOC entities (servers). It is highly suitable for early deployment phases; as the network grows, migration to Runcom's RN-NOC-XXX can be easily implemented.

ACCESS

RNU303-USB USB Dongles nomadic or mobile



Runcom's RNU303-USB USB dongle enables nomadic or mobile connectivity to the internet with a simple and intuitive user interface. Compliant with IEEE 802.16e Wave 2 profile, the device implements low-power consumption techniques that minimize battery draining in laptops or mini-laptops. The unit supports the 2.3–2.7GHz and 3.3–3.7GHz frequency bands.

RNU300ETH-MIMO Residential Indoor CPE



Runcom's RNU300ETH-SI / MI residential indoor CPE is designed for rapid and simple deployment by residential users. With high service availability at enhanced ranges, the unit includes high-gain MIMO antennas and demonstrates superior indoor coverage. Compliant with IEEE 802.16e Wave 2 profile, it supports the 2.3–2.7GHz and 3.3–3.8GHz frequency bands.

RNU300ODU Residential Outdoor CPE



Runcom's RNU300PoE residential outdoor CPE is designed for rapid and seamless external deployment, and can be easily installed by trained personnel to save OPEX. The operator will deploy the Runcom residential outdoor CPE when specific service levels must be guaranteed to the end customer. The unit is available in two form factors with a 7 dBi or 15 dBi integrated antenna. The unit can operate in enhanced

ranges in both LOS and NLOS conditions. This unit complies with IEEE 802.16e Wave 2 profile and supports the 2.3–2.7GHz and 3.3–3.8GHz frequency bands.

SILICON SOLUTIONS

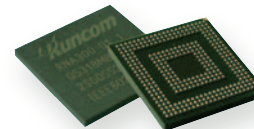
RNF2001 IEEE 802.16e-2005 PHY/MAC Silicon for MACRO and PICO Base



The RNF2001 mobile WiMax Silicon for Macro and PICO BS is an advanced implementation of the IEEE 802.16e-2005 standard modem and low-level MAC layer.

The device is fully compliant with the WiMAX forum mobile system profile and Wave 2 functionalities. The device supports advanced features beyond the WiMAX Forum recommendations such as receive beam forming, transmit beam forming, uplink sounding, closed-loop MIMO and multicast/broadcast services.

RNA300 IEEE 802.16e Rev 2 PHY/MAC SoC



The RNA300 is a High-performance and highly integrated SoC that provides an optional solution for mobile subscriber systems (MSS) wanting to employ IEEE 802.16e Rev 2 WiMAX

functionality. THE RNA300 is self-contained and only requires a handful of external components to create a wireless end-to-end mobile WiMAX solution for interfacing between WiMAX BS and MSS. The RNA300 utilizes state-of-the art system-on-chip (SoC) technology. It contains analog and digital mixed-signal cores and an embedded ARM 11 CPU. This provides a highly-integrated, single-chip solution in addition to integration support for a single chip RF, baseband, WiFi and VoIP at a very low cost.

The chip incorporates both PHY and MAC layers for implementation of OFDMA terminals that comply with the IEEE 802.16e standard. It contains advanced features, such as: MIMO Matrix B, collaborative MIMO, closed-loop MIMO (Matrix 4X2), beam-forming support, higher throughput (50Mbps), low-power consumption, HARQ type 4, as well as application processor functions.

Reference Design Kits

Runcom's base station and CPE products are available for OEMs and ODMs in the form of a reference design kit. A complete production database is available with a variety of RF solutions including 1.4–1.8GHz band, 2.4–2.7GHz band and 3.3–3.8GHz band.



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