The PacketWave 100 Series subscriber units provide "always-on" multi-megabit IP services and Internet access to subscribers.

PacketWave® 100 Series

Subscriber Units

Multiservice broadband wireless access for small to midsize businesses, SOHOs, and homes

Key Benefits

High-speed Internet access
The PacketWave system delivers data rates from 64 Kbps, with burst speeds up to 20 Mbps upstream and downstream.

Increased coverage
Supports line-of-sight (LOS), obstructed LOS, and non-LOS installations.

High spectrum efficiency
Variable channel width from 1-7 Mhz for scalable deployment and interference resiliency.

Easy to install
Simple setup reduces service provisioning time. The radio with integrated antenna is as easy to install as a satellite dish. An antenna alignment tool makes antenna pointing easy.

Support for SLA, multiple services
PacketWave 100 Series units connect directly to a PC or Ethernet LAN, and support enhanced applications such as SLA, voice and streaming video.

Complete system solution
The fully integrated PacketWave system provides a complete broadband wireless solution, including base station, subscriber units, radios, and antennas that accommodate a variety of frequency bands—2.5, 3.3, 3.5, 5.3, and 5.8 GHz.

Aperto® Networks' PacketWave® system gives service providers a fully-integrated service intelligent platform for building high-density broadband wireless networks for personalized service delivery. PacketWave system architecture supports multiservice applications, scales easily for more capacity and coverage, and provides dynamic link optimization on a per-subscriber basis. It also features fast deployment and simplified management.

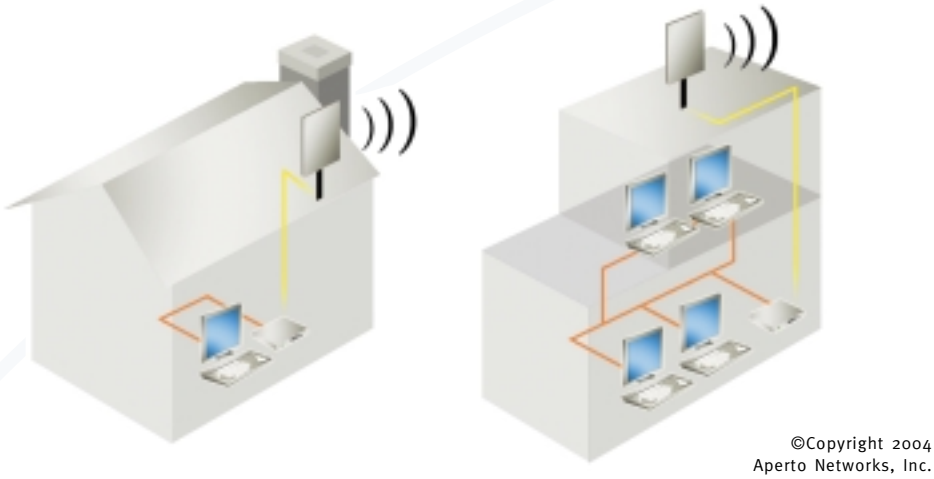
Working with the PacketWave 1000 base station unit, PacketWave 100 Series subscriber units deliver high-speed, always-on Internet access for small to midsize businesses, small office/home office (SOHO) customers, and residential users. With a PacketWave 100 Series unit installed at the subscriber's site, users can browse Web pages, handle voice calls, view streaming video, and download files—all at multimegabit data rates.

The PacketWave 100 subscriber equipment consists of an indoor bridge/router unit and an outdoor radio/antenna unit. Configurable as a bridge up to 2000 hosts, or a router that supports up to 250 hosts. The PacketWave system delivers data rates from 16 Kbps with burst speeds up to 20 Mbps in a 6 MHz channel—enabling the most efficient use of aggregate bandwidth, so greater numbers of users can enjoy simultaneous access.

Aperto Networks offers three PacketWave models designed to meet a variety of subscribers and network requirements:

- PacketWave 110 model provides bridging and VLAN, with support for up to five hosts.
- PacketWave 120 model provides bridging, VLAN, Network Address Translation (NAT), and PPPoE with support for up to 20 hosts.
- PacketWave 130 model provides bridging, VLAN, NAT, PPPoE, and IP routing with support for up to 250 hosts. Bridging supports up to 2000 hosts.

PacketWave Broadband Wireless System



Complete Package
The Aperto Networks' PacketWave 100 Series provides a complete subscriber package for fast Internet access. The easy-to-install radio unit with integrated antenna is mounted on the outside of the subscriber's office building or home. The indoor bridge/router connects to either a PC or an Ethernet/Fast Ethernet LAN.

Scalable Architecture

The PacketWave system can handle thousands of wireless subscribers, whether they're spread out or live in densely populated neighborhoods.

Combining high frequency reuse with advanced interference management and mitigation techniques, the PacketWave system conserves valuable spectrum by allowing the service provider to cover an extensive geographical area with a minimum number of channels.

As bandwidth and subscriber needs increase, network operators can easily add channels or new sectors within the cell. Multiple PacketWave 1000 base station units can be stacked to provide additional bandwidth using multiple channels per sector. Operators can also economically deploy additional cells to extend the service capacity and coverage footprint.

Rapid Service Provisioning

The PacketWave 100 Series is easy to install and configure. The outdoor radio/antenna component can be installed on the roof or roofline, while the compact indoor unit connects to a personal computer or Ethernet network. Once the two components have been cabled together, the indoor unit automatically obtains an IP address from the network and downloads the configuration parameters.

Service Flexibility

The PacketWave system makes it easy to customize broadband access to fit customers' requirements. The PacketWave 100 Series subscriber unit supports remote provisioning for a variety of speeds, eliminating the need for costly truck rolls. What's more, it gives service providers the flexibility to offer multiple flows with different service classes for residential and business applications.

Simple LAN Configuration

For business users, the PacketWave 100 Series provides additional features that streamline LAN configuration. Integrated in the PacketWave 120 and 130, a Dynamic Host Configuration Protocol (DHCP) server allocates IP addresses for each workstation. And Network Address Translation (NAT) enables users to share a single public IP address while providing enhanced security. The PacketWave 110 model provides simple plug-and-play bridging for residential applications.

Breakthrough Technologies

Aperto Networks' PacketWave products feature three market-leading technologies: RapidBurst® advanced Time Division Multiple Access (TDMA) protocol, OptimaLink® dynamic per-subscriber link optimization, and ServiceQ® per-flow Quality of Service (QoS) and bandwidth management.

RapidBurst technology enables the PacketWave system to achieve exceptionally low latency and unprecedented spectral efficiency. With RapidBurst, the PacketWave system delivers burst rates up to 20 Mbps over a 6 MHz channel.

In addition, RapidBurst dynamic bandwidth allocation enhances efficiency by assigning time slots and packet sizes according to actual demand and service levels. An advanced TDMA burst mode ensures maximum flexibility and bandwidth efficiency in both upstream and downstream transmissions. Time Division Duplexing (TDD) technology maximizes flexibility and enables adjustable allocation of upstream and downstream bandwidth depending on traffic requirements.

OptimaLink technology performs dynamic control of link parameters to optimize each subscriber's connection in a multiuser, cellular network. The OptimaLink adaptive algorithm dynamically selects and adjusts PHY and MAC-layer parameters, including antenna diversity, modulation, transmit power, retransmission policy, and wireless packet size. The benefit to network operators is increased capacity and broader coverage that includes obstructed-line-of-sight and non-line-of-sight subscribers in a multi-path environment.

ServiceQ technology can provide different service classes to each subscriber on an application-by-application basis. This means personalized services can be delivered intelligently, allowing the service provider to maximize revenue opportunities with differentiated service offerings and effective management of Service Level Agreements (SLAs).

With ServiceQ, service providers can set up multiple QoS profiles for each PacketWave 100 Series subscriber unit. Each profile contains various QoS metrics (such as maximum and minimum bandwidth, latency, and jitter) based on Class of Service requirement like Constant Bit Rate (CBR), Committed Information Rate (CIR), or Best Effort (BE). Using a highly advanced scheduling mechanism, the PacketWave system enforces the metrics in each profile. The result – service providers can offer tiered services that help differentiate their offerings in the marketplace.

In addition, the intelligent ServiceQ packet classifier can associate end-user applications to QoS profiles by mapping existing indicators such as IP ToS and DiffServ fields, as well as data packet header information such as IP or MAC addresses and port numbers. Consequently, the PacketWave system can identify applications such as web browsing, telephony, and video streaming – providing the appropriate QoS, resulting in a more personalized and valuable service to subscribers.

PacketWave 100 Series Subscriber Unit Specifications

Models

	PW 110	PW 120	PW 130
Number of hosts	5	20	250
Networking	Bridge	NAT/Bridge	Router/NAT/ Bridge
Number of service flows and VLAN	8	8	16
DHCP clients supported with built-in server	N/A	20	100

Indoor Bridge/Router Unit

Interfaces

10/100 Base-T Ethernet: RJ-45 connector

IF Port (Radio Connection): F connector

IF Control Port (Radio Connection): RJ-45 connector

Cable Length: 164 feet (50 meters) or 328 feet (100 meters) with specified cable

Modem

Modulation: QPSK, 16 QAM

Power Requirement

100-240 VAC; 47-63 Hz; 30 watts

Networking
(Support Depends on Model)

Bridging, 802.1Q VLAN

DHCP Server and Client

NAT

IP Routing

Security

DES Encryption: 56, 112, 168 bit (planned)

Management

Service Provider
Subscriber Provisioning using Java-based WaveCenter Configuration Manager on Windows 2000, and Linux

Embedded WaveCenter agent supporting SNMP and Web browser interfaces

SNMP, MIB II (RFC 1213), Aperto Enterprise MIBs

Software upgrade tool

Subscriber
Web-based interface for subscriber side DHCP server and NAT configuration

Installation Manager
Align antenna and perform throughput test; runs on multiple platforms

LED Indicators

Power

Wireless: transmit, receive, status

LAN: transmit, receive, link

Dimensions and Weight

Width: 1.5 in (3.8 cm)

Height: 6.6 in (16.8 cm)

Depth: 9.1 in (23.1 cm)

Weight: 2.2 lbs (1.0 kg)

Environmental

Operating Temperature: 32° to 104° F (0° to 40° C)

Humidity: 10% to 90% noncondensing

Regulatory Approvals

FCC Part 15 Class B, CE, EN

Outdoor Radio/Antenna Unit

Environmental

Operating Temperature: -31° to 140° F (-35° to 60° C)

Storage Temperature: -40° to 257° F (-40° to 125° C)

Humidity: 0% to 100%

Radio/Antenna Options

2.5-2.686 GHz Unit

Standard Range: up to 11.6 miles/18.7 kilometers
Extended Range: up to 26 miles/42 kilometers with external subscriber antenna

Width: 13.4 in (34 cm)
Height: 13.4 in (34 cm)
Depth: 1.9 in (4.8 cm)

3 dB Beamwidth: azimuth 20°; elevation 20°

Horizontal and vertical polarization

3.3-3.8 GHz Unit

Standard Range: up to 10.5 miles/16.9 kilometers
Extended Range: up to 23 miles/37 kilometers with external subscriber antenna

Width: 11.8 in (30 cm)
Height: 11.8 in (30 cm)
Depth: 1.9 in (4.8 cm)

3 dB Beamwidth: azimuth 20°; elevation 20°

Horizontal and vertical polarization

5.3-5.4 and 5.725-5.925 GHz Unit

Standard Range: up to 8.2 miles/13.2 kilometers
Extended Range: up to 13 miles/20.8 kilometers with external subscriber antenna

Width: 8.1 in (20.5 cm)
Height: 8.1 in (20.5 cm)
Depth: 1.9 in (4.8 cm)

3 dB Beamwidth: azimuth 17°; elevation 17°

Horizontal and vertical polarization

* The maximum EIRP varies depending on country regulations. Contact your Aperto Networks sales representative for details.

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