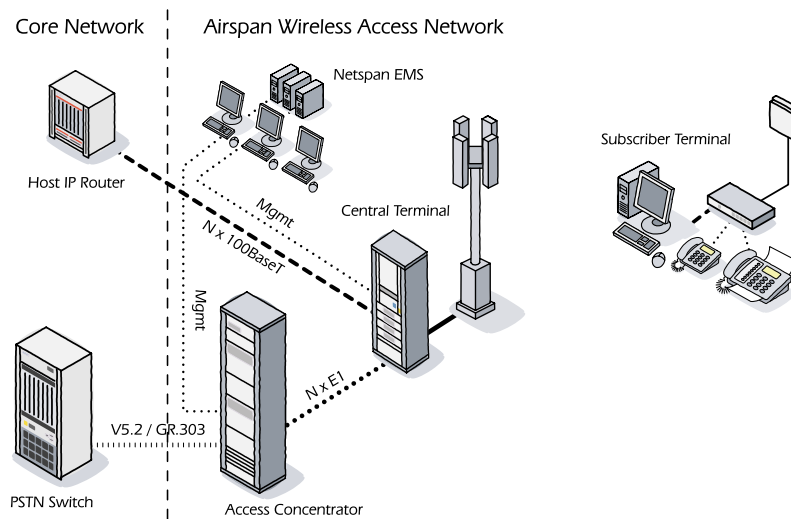




Airspan Networks' AS4020 is a sophisticated wireless point to multipoint fixed Broadband Wireless Access system delivering High Speed Internet connections and High Quality Telephony Services. It's unique, intelligent adaptive radio interface ensures optimum use of radio spectrum for both Internet and voice applications. Optimised for operation in licensed radio spectrum, the combination of AS4020's frequency re-use scheme and outstanding RF Link Budget minimises the RF bandwidth required for providing contiguous system coverage.



## Product Information



## Overview

AS4020 delivers up to 14Mbit/s data throughput per radio FDD channel, giving base station capacity to 170Mbit/s. Voice capacities of up to 36Erlangs per radio frequency channel share the same radio interface using a real-time dynamic voice / data boundary, hence optimising system capacities for mixed voice and data applications.

AS4020 is designed for Network Operators and Internet Service Providers who wish to offer premium services; the system is ideal as either an enhancement to existing network (wired or wireless), or as a platform to deploy a completely new network. AS4020 operates in various licensed frequency bands from 1.8 to 4.0GHz ensuring the maximum coverage of fixed access radio spectrum available to operators today.

AS4020 can be described as a "flexible access tool" for network operators to provide a variety of services to their end-user customers. By supporting transparent connections to the operator's network, AS4020 provides the ability to offer services that are the same quality and performance as wired services.

The services offered by an Airspan AS4020 system are perceived by end-users as a Wireless DSL solution. It provides customers with combinations of Voice Telephony and an always-on high-speed Internet connection, comparable to the capabilities of wired DSL solutions.

## Key Features

(Benefits)

- Support for high speed IP data with data rates up to 14Mbit/s per RF channel (FDD)
- Full Duplex Operation
- Compact, integrated design
- High quality, low delay voice (<1ms)
- 160dB RF Link Budget
- Frequency Reuse n=1/2
- Dynamically adaptive modulation & FEC
- Transparent support for voice CLASS services
- VLAN Support
- Full range of QoS features
- Wide range of licensed frequency bands supported
- Supports a wide range of Subscriber Terminals





## Applications

AS4020 is ideally suited to ILECs, CLECs, DLECs and ISPs wishing to roll out IP and telephony services to the more demanding SME, SOHO and residential customers, where high-speed and committed QoS levels are imperative. Support for carrier grade voice provides an unbeatable combination of voice and IP services. Here are some of the applications of AS4020:-

- **High Quality Voice**

*Subscriber Terminals (STs) supporting toll quality voice are available from 1 to 4 lines. Single lines may be offered to residential customers or to business customers as the voice path transparency allows PSTN Switch Class services to be provided to the customer's phone. Multi-line units are used to offer multiple voice lines to businesses or to provide telephony services to a number of homes, so reducing the system cost per home.*

*AS4020's low voice delay (<1ms) is an extremely efficient way of delivering voice services, making the access contribution to the overall network delay budget minimal.*

- **Packet (IP)**

*AS4020 STs provide Ethernet packet rates at up to 2.3 Mbit/s in the downlink 1.5 Mbit/s in the uplink. AS4020 allows CIR and MIR to be configured per ST, allowing different classes of service to be marketed to various subscriber types. In addition, prioritisation rules (ranging from simple to complex) further increase the flexibility by adding priority as part of the service offering.*

*The most popular packet application is high speed Internet access, allowing the customers to experience a superior service and even enabling servers to be located at customer's premises..*

- **Mixed Voice and Internet Access**

*STs are available that provide simultaneous voice and packet services to maximise the service delivery options to the customer. Both services operate independently so that high-speed Internet access*

*operates simultaneously with toll quality voice.*

- **Virtual Private Networking**

*Subscriber Terminals may be logically grouped into Virtual Private Networks to allow communication between STs for a business customer, for example, where servers are connected to one ST and terminals to others. This configuration operates very efficiently across the radio channel as the radio channel capacity is shared between VPNs whilst keeping the VPNs logically separate.*

*IEEE 802.1q support allows the VPN to be extended outside of the AS4020 to third party systems e.g. across a routed network.*

- **Multimedia Services**

*In order to allow multimedia services such as video or VoIP, low delay, low jitter and high throughput are necessary from the access system. The AS4020 is readily configured for these applications by the use of prioritisation rules (operating at the IP or MAC level). Multimedia transmissions are thus recognised by the AS4020 and provided the correct priority and throughput capacity for them to function.*

## Network Management

AS4020 is managed by AS8200 Netspan, which supports a client/server architecture. The Netspan server runs on a windows server platform, making use of an SQL database to store the configuration, statistics and alarm history from the radio network. Access to the Netspan server is from Microsoft Internet Explorer, using the web service of the Netspan server.

Each Netspan operator is given configurable access rights, allowing each operator to be granted the rights appropriate to their function.

Netspan provides configuration and diagnostic access to all AS4020 network elements, down to each individual Subscriber Terminal.





## AS4020 Technical Specification

### Radio Technology

Radio Interface:	Bespoke Direct Sequence CDMA
Service Area*:	Urban: 2 – 5 km Suburban: 5 – 10 km Rural: 15 – 70 km
Frequency:	1.8 GHz to 4 GHz range in accordance with ITU-R and CEPT plans for Fixed Access Systems and in FCC PCS bands
Deployment:	Cellular frequency re-use, N=1/2 for sectored cells
RF Modulation:	QPSK, 16QAM and 64QAM AS4020 dynamically adjusts individual subscriber link modulation to maximize throughput
Link Budget*:	>160dB
RX Sensitivity*:	BS: -116dBm, CPE: -112dBm @ 10 <sup>-6</sup> BER (single CDMA code)
Forward Error Correction:	Code Rates 0.5, 0.75 and Turbo codes AS4020 dynamically adjusts individual subscriber link FEC to maximize throughput
Link BER:	10 <sup>-7</sup>
Antenna Gain (BS)*:	17dBi typical for 60° sector
Antenna Gain (CPE)*:	18dBi (integral), 24dBi (external)
Standards Compliance*:	ETSI EN301 055, ETSI EN301 124, FCC CFR47
Number of Subscriber Terminals:	480 max per channel

\*Frequency Band specific

### Networking

IP Mode:	802.1d self-learning bridging. Ipv6 ready
VoIP:	Supported
QoS:	CIR, MIR, 802.1p, priority by ToS per subscriber under NMS control
Services:	VLAN, 802.1q, Closed User Groups
Latency:	<20ms

### Voice Features

Codec:	64k PCM, 32k ADPCM voice coding V92/90 modem and fax support
Voice Capacity:	36Erlangs per 3.0/3.5MHz RF Channel (with 32k ADPCM)
Signalling:	V5.2/5.1, CAS and GR-303 switch interfaces
Services:	Transparent CLASS service support including CLI, support for payphones (12/16 KHz)
Latency:	<1ms (64k PCM), <5ms (32k PCM)



## AS4020 Technical Specification (continued)

### Management

**AS8200:** The AS4020 management system simplifies the handling of provisioning, alarm management, performance monitoring and fault localization. AS8200 utilizes browser based clients and SQL servers to manage up to 500,000 lines

### Mechanical and Electrical Specification

#### Base Station (BS):

Equipment Rack:	Supporting 4 RF channels - 1500mm (H) x 600mm (W) x 300mm (D) - Front Access
Network Interfaces:	10/100BaseT plus E1/T1 for backhaul
Maintenance Interfaces:	RS232 or 10/100BaseT
Management Interfaces:	10/100BaseT
Voltage:	-48V DC nominal
Power consumption:	<500 watts (4RF Base Station)

### Subscriber Terminals

Series Letter	Type	Description	Function
V	V1	Voice only	One line voice 64kbps PCM or 32kbps ADPCM
	V2	Voice only	Two line voice 64kbps PCM or 32kbps ADPCM
	V4	Voice only	Four line voice 64kbps PCM or 32kbps ADPCM
P	P2V2	Voice & Data	Voice & Data: 2 x 100BaseT, 2 Phone Lines
	P1V4	Voice & Data	Voice & Data: 1 x 10BaseT, 4 Phone Lines
	W1	Wi-Fi Terminal	1 x 802.11b AP, 1 x 10BaseT, 2 Phone Lines

### Environmental

Temperature:	-5°C to +45°C (Indoor)	-40°C to +60°C (Outdoor incl. Full solar load)
Humidity:	95% @ 40°C (non condensing)	

### Standards Compliance, General

EMC:	EN 55022 Class B
------	------------------



**Worldwide Headquarters;**  
**Airspan Networks Inc.**  
777 Yamato Road, Suite 105,  
Boca Raton, FL 33431-4408, USA  
Tel: +1 561 893 8670 Fax: +1 561 893 8671

**Main Operations;**  
**Airspan Communications Limited**  
Cambridge House, Oxford Road,  
Uxbridge, Middlesex, UB8 1UN, UK  
Tel: +44 (0) 1895 467 100 Fax: +44 (0) 1895 467 101

[www.airspan.com](http://www.airspan.com)