

BreezeCOM and Floware unite



BreezeACCESS™ OFDM

Powering provider performance

Featuring the same field-proven and mature rich-feature set as the well-established and highly successful products in the BreezeACCESS portfolio, BreezeACCESS OFDM is the ideal point-to-multipoint broadband wireless access system for Operators offering high-bandwidth IP-based services. Leveraging the excellent multi-path resistance capabilities of OFDM technology, BreezeACCESS OFDM enables operation in near and non-line-of-site (NLOS) conditions, which enable Operators to reach a previously-inaccessible and broader segment of the subscriber population, with fewer Base Stations. These advanced capabilities radically reduce the initial cost of investment, installation costs and time to market while increasing Operator revenue potential.





Product Highlights

BreezeACCESS OFDM delivers a comprehensive range of product features, ensuring fast, consistent and reliable data and IP oriented services, including...

- Orthogonal Frequency Division Multiplexing (OFDM) technology ensures high data rates, high spectral efficiency and immunity to interference and multi-path conflicts.
- Near and non-line-of-sight (NLOS) capabilities.
- Demand-based build-out, easy installation and low cost of ownership enables rapid market penetration, increased subscription and enhanced value-added services.
- High base station data capacity:
 - through the inherent ability of OFDM technology for high data rates and high spectral efficiency paired with the BreezeACCESS OFDM system capability for frequency re-usability.
 - data capacity of 72/192 Mbps over typical frequency allocations of 10.5/28 MHz respectively.
- Packet switching technology optimized for IP-based applications and "always on" connectivity.
- Independent uplink/downlink transmission settings for CIR/MIR, enabling assured and differentiated SLA.
- Adaptive modulation: maximize throughput according to radio performance:
 - BPSK, QPSK, 16QAM, 64QAM
 - Automatic multi-rate selection
- Advanced filtering capabilities, such as:
 - IP filtering
 - Protocol-based filtering
 - Broadcast filtering
- End to end QoS with 802.1p and IP ToS
- VPN support with 802.1Q VLANs
- Carrier grade features including a rack mount chassis base station with redundancy, hot swap capability and UPS facilities.
- Highly cost effective infrastructure and customer premises equipment.
- Easy-to-use SNMP-based remote management system, enabling simple unit configuration and multiple simultaneous unit upgrading.

Operating in the licensed 3.5 GHz frequency band, BreezeACCESS OFDM leverages Orthogonal Frequency Division Multiplexing technology to deliver high data rates, high spectral efficiency and immunity to interference and multi-path conflicts. Delivering data burst rates of up to 12 Mbps, BreezeACCESS OFDM ensures always-on connectivity to a full range of IP-based services, including fast Internet, VPNs and VoIP.

BreezeACCESS OFDM provides an instant and independent infrastructure, which is immediately deployable with lower infrastructure construction and operating costs than any other solution on the market.

BreezeACCESS OFDM System Components **BreezeACCESS OFDM CPEs - Building bridges to BWA**

The BreezeACCESS OFDM Subscriber Units provide a bridge between the wireless and wireline media, supporting up to 512 MAC addresses. The SUs connect to the subscriber's data equipment via a standard IEEE 802.3 Ethernet 10/100-BaseT (RJ 45) interface.

Indoor/Outdoor Units

The BreezeACCESS OFDM indoor/outdoor Subscriber Units include an indoor desktop or wall-mountable unit, containing the processor, modem, Ethernet interface and the IF radio component. The indoor unit is powered by a desktop Power Supply Unit, supplying 24 Volts. The outdoor unit comprises a radio module and integrated flat panel antenna.



The indoor and outdoor units are connected via a 50-ohm coaxial Intermediate Frequency (IF), relaying 140 MHz IF signals between the units. Data, power, management and control signals are transmitted between the indoor unit and the outdoor unit via this coaxial cable.

BreezeACCESS OFDM Subscriber Unit

Product Name	Product Description
SU-A-BD-OF-3.5a1	BreezeACCESS OFDM Subscriber Unit. Includes indoor network interface unit (SU-NI-BD-OF) and outdoor radio unit with integrated antenna (SU-RA-OF)

BreezeACCESS OFDM Base Station Equipment - Reliability, Flexibility, Performance

Delivering superior flexibility in architecture and network deployment, BreezeACCESS ensures demand-based scalability combined with flexible modularity.



Base Station Shelf

The 19" 4U Base Station chassis (BS-SH-OF) provides 8 interface slots and two slots designated for power supply modules. The Base Station is powered by a -48 VDC power source, with a back-up module ensuring complete fail-safe redundancy. Up to six BS-AU modules can operate simultaneously, with two supplementary slots reserved for future use.



The indoor and outdoor units are connected via a 50-ohm coaxial Intermediate Frequency (IF), relaying 140 MHz IF signals between the units. Data, power, management and control signals are transmitted between the indoor unit and the outdoor unit via this coaxial cable.

The outdoor units feature two antenna configuration options, delivering enhanced network flexibility, as follows:

- **AU-A-BS-OF units:** Comprise a radio module and integrated sectorial antenna.
- **AU-E-BS-OF units:** Include a radio module and RF connector for a separate external antenna.



Indoor/Outdoor Access Units

The BreezeACCESS OFDM indoor/outdoor Access Unit configuration includes an indoor module and outdoor unit.

The AU-NI-BS-OF indoor unit is a network interface module that fits in the base station chassis, containing the processor, modem, Ethernet interface and IF radio module. The AUs connect to the network backbone via a standard IEEE 802.3 Ethernet 10/100-BaseT (RJ 45) interface.

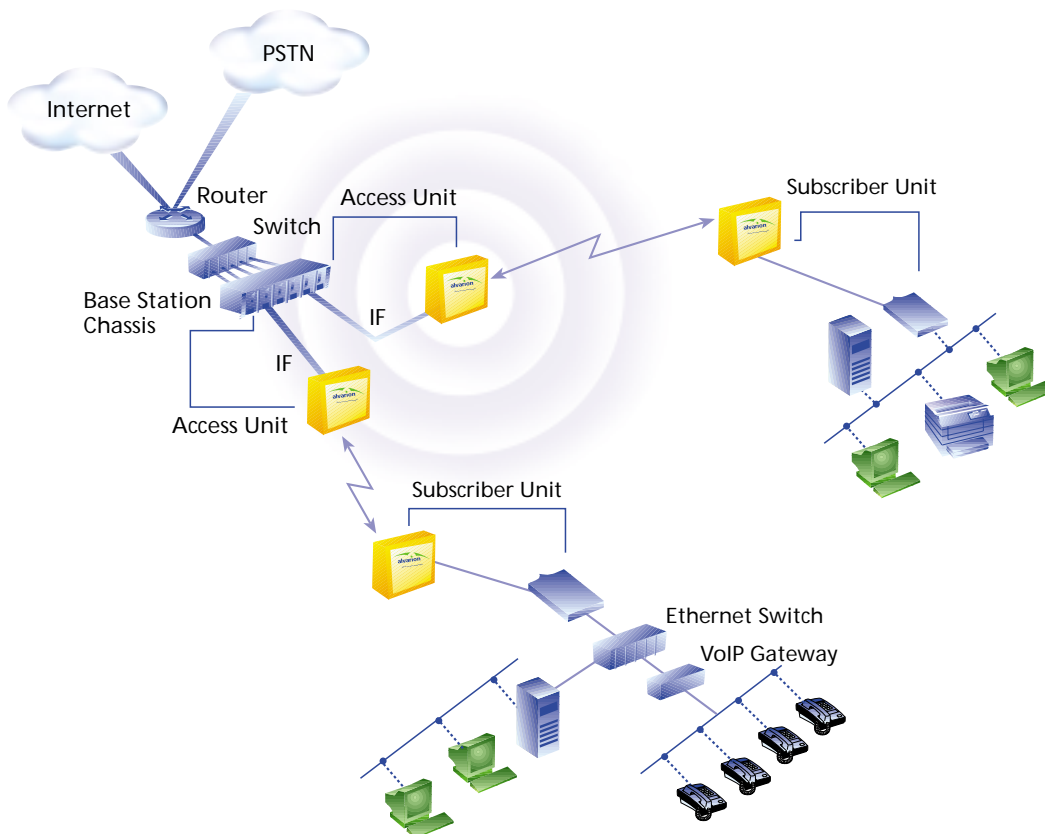


BreezeACCESS OFDM Base station equipment

Product Name	Product Description
BS-SH-OF	BreezeACCESS OFDM base station chassis with 1 power supply
AU-A-BS-OF-3.5a1	BreezeACCESS OFDM Access Unit. Includes base station module (BS-AU) and outdoor radio unit with integrated antenna (AU-RE)
AU-E-BS-OF-3.5a1	BreezeACCESS OFDM Access Unit. Includes base station module (BS-AU) and outdoor radio unit (AU-RE)-antenna not included
BS-PS-OF	BreezeACCESS OFDM base station power supply card (48DC)

BreezeACCESS OFDM

Advanced access in a world without wires.



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Specifications

Radio

Frequency	Uplink: 3.400-3.450 MHz Downlink: 3.500-3.550 MHz	
Radio Access Method	TDMA FDD	
Standard Compliance	ETSI EN 301 021	
Channel Bandwidth	3.5 MHz	
Central Frequency Resolution	250 KHz	
Antenna (SU-RA)	17dBi, 20°, vertical polarization, compliant with EN 302 085 Class, TS 2	
Antenna (AU-RA)	16.5dBi, 60°, vertical polarization, ETSI CS2 compliant (3.4-3.7 GHz)	
Antenna Port (SU-RE, AU-RE)	50 ohm	
Output Power (at antenna port)	20dBm +/-1dBm. Power control range: SU - 40dB; AU -12dB	
Maximum Input Power (at antenna port)	-25dBm before receiver saturation -5dBm for damage	
Sensitivity, typical (dBm at antenna port, BER 1E10 ⁻⁶)	2 Mbps	-93
	4 Mbps	-90
	8 Mbps	-84
	12 Mbps	-78
Data Rate	2, 4, 8, 12 Mbps	
Modulation	OFDM modulation, 64 FFT points, BPSK, QPSK, 16QAM, 64QAM	
OFDM symbol rate	55.5 ksymbol/sec	
Error Correction	Convolutional encoder, Viterbi decoder, Coding rate: 3/4	

Data Communication

Standard Compliance	IEEE 802.3 CSMA/CD
VLAN support	IEEE 802.1Q
Layer-2 Traffic Prioritization	IEEE 802.1p
Layer-3 Traffic Prioritization	IP ToS according to RFC791

Outdoor Unit to Indoor Unit Communication

IF Frequency	140 MHz
IF Cable Impedance	50 ohm
Maximum IF Cable Attenuation	10dB
Maximum IF Cable DC Resistance	2.7 ohm

Configuration and Management

Local Management	Via MON port, Monitor program using terminal emulation
Remote Management	SNMP, Telnet
Remote Management Access	From the wired LAN or from the wireless link
SNMP agents	SNMP ver 1 client MIB II, Bridge MIB, Private BreezeACCESS OFDM MIB
Security	RC4 Authentication and filtering
Software upgrade	TFTP download

Interfaces

	Outdoor Unit	Indoor Unit
IF	TNC jack, lightning protected	TNC jack, lightning protected
ANT (AU-RE)	N-Type jack, lightning protected	
Ethernet		10/100Base-T (RJ-45) with 2 embedded LEDs
Monitor		3-pin low profile
Power	24 VDC from indoor unit via the IF cable	SU-NI: DC jack for the SU-PS power supply, KYCON KPJ-3S-S BS-PS: D-Type 3 Power pin male Amphenol 717TWA3W3PHP2V4RRM6

Electrical, Mechanical and Environmental

	Outdoor Unit	Indoor Unit
Power	24 VDC from indoor unit via the IF cable	SU: 48W max. SU-NI: 24VDC/2A from SU-PS SU-PS: 100 - 240 VAC, 50-60 Hz BS: -48 VDC, 420W max. for a fully equipped chassis (6 AU + 1 PS). 44W max. for each AU (indoor + outdoor).
Mechanical	SU-RA: 306x306x72 mm, 2.5 kg AU-RE: 306x117x55 mm, 1.7 kg AU-RA: 500x117x70 mm, 2.9 kg	SU-NI: 305x182x54 mm, 1.6 kg SU-PS: 110x60x35 mm, 0.4 kg BS-SH: 19", 4U, 483x177x265 mm, 4 kg AU-NI-BS: 260x129x36 mm, 0.28 kg BS-PS: 257x129x71 mm, 1.12 kg
Operating Temperature	-40°C to 55°C	0°C to 40°C
Operating Humidity	5%-95% non condensing Weather protected	5%-95% non condensing

Standards Compliance, General

Type	Standard
EMC	ETS 300 385
Safety	EN 60950
Environmental	ETS 300 019 part 2-3 class 3.2E for indoor units ETS 300 019 part 2-4 class 4.1E for outdoor units
Radio	ETSI EN 301 021 V.1.4.1 ETSI EN 301 753 V.1.1.1