

## Specifications

### Radio

Guiding Standard	CEPT/ERC Rec. 14-03
Frequency Band	Base Station Transmit: A: 3.50 -3.54 B: 3.53- 3.57 C: 3.56 - 3.60 Receive: A: 3.40-3.44 B: 3.43- 3.47 C: 3.46 - 3.50
Total Output Power	From Base Station Up to 27 dBm for 64 QAM modulation, up to 35 for GFSK modulation From WALKair TS = 18dBm, from BreezeACCESS CPE up to 28, from BreezeACCESS OFDM up to 20 dBm
Spectral Efficiency	2.5 bits/sec/Hz
Modulation & Coding Technique	GFSK 64 QAM @ Trellis Coding Modulation 64 QAM to QPSK for Collocated OFDM (Viterbi Decoder)
Radio Access Method	Multi Carrier-TDMA/FDD (WALKair carriers) FH-CDMA (BreezeACCESS carriers)
Receiver Sensitivity and Capacity	WALKair carriers: -87dBm (@ BER 10 <sup>-9</sup> ) BreezeACCESS GFSK carriers -93dBm @ 1Mbps (@ BER 10 <sup>-6</sup> ) -86dBm @ 2Mbps -77dBm @ 3Mbps Collocated BreezeACCESS OFDM Carriers 3.5 MHz 1.75 MHz 2 Mbps -94 1 Mbps -97 4 Mbps -91 2 Mbps -94 8 Mbps -85 4 Mbps -86 12 Mbps -79 6 Mbps -82
Antenna Size	50x15x7 cm.
Antenna Gain	13.5 dBi (90°), 15.5 dBi (60°), at the CPE side 18 dBi (18°)
Standard Compliance	EN 302 085, class CS3, TM4

### Interfaces

Capacity	3 E1 or V.35/X.21 Interface modules per BS-BU, up to 4 Mbps per BS-BU 1 Ethernet interface per AU, up to 3 Mbps 1 Ethernet interface per Collocated OFDM AU, up to 12 Mbps (3.5MHz Channel)
E1	Symmetrical-pair 120 Ohm balanced interface. Input signal bit rate: 2048 kbit/s ±50 ppm. Line code: HDB3. Frame Structure: CCITT G.704 _5 and _2.3 with or without CRC-4, operator selected Jitter performance: ITU-T G.823, ITU-T Rec. G.736 and 431 Complies with: ETS 300 011, ITU-T Rec. G.703, _6.
V.35 / X.21	Data rate: N x 64Kb/s, up to 2.048Mb/s V.35 mode: CCITT Rec. V.35 (Red book) Balanced: Annex II Unbalanced: ITU-T Rec. V.28 X.21 mode: ITU-T Rec. X.21
Ethernet	Indoor units: 10BaseT, (RJ-45) with 2 embedded LEDs
AU Monitor	Indoor units: 3-pin low profile

### Mechanical

BS-BU (Indoor Unit)	Width: 48cm (19"), Height: 4.4cm (1U), Depth: 23cm, Weight: 3Kg
BS-SH (Indoor Unit)	Width: 48cm (19"), Height: 13.2cm (3U), Depth: 26cm, Weight: 6Kg fully loaded
RFU (Outdoor unit, excluding antenna)	Dimensions: 36x15x24 cm Weight 10Kg.

### Power

BS-BU and RFU	Voltage: -48VDC, 40W per BS-BU Heat dissipation: 36W
AU	25W
BS-SH	-48VDC, 200W for fully equipped shelf

### Environmental

Operating Temperature	Indoor: 0°C to 40° C Outdoor: -5°C to 45° C
Operating Humidity	5% to 95% non-condensing.

### Standards compliance

EMC	EN 300-385, FCC Part 15
Safety	EN 60950, UL 1950
Environmental	ETS 300 019,
Wind loading	EN 302 085
Vibration	EN 301 021

# AlvariBase

## The All-in-one Broadband Wireless Access Solution

Service providers choosing a broad market penetration strategy have, in the past, faced challenges in finding a solution that can address the entire market - from high end residential through SOHO and small business, all the way up to medium sized businesses and corporate branch offices. No Broadband Wireless Access solution could provide, at the same time, low cost IP connectivity alongside carrier class corporate voice and data solutions. The introduction of AlvariBase changes the BWA rules. Now a service provider can provide the entire range of BWA services - from Internet access through leased lines and PBX connectivity - to the entire addressable market, from a single infrastructure.



## Product Highlights

- Demand-based build-out Base Station, Multi Carrier Radio, easy installation and low cost of ownership enables rapid market penetration.
- Single platform combines all communication and information technologies, including IP, Ethernet, Frame Relay, Leased Line, POTS and ISDN. Packet switching technology optimized for IP-based applications and "always on" connectivity.
- Efficient backhaul connectivity guarantees superior coverage for mobile and fixed narrowband wireless system Base Stations.
- Highest spectral efficiency - 2.5 Bit/Sec/Hz with WALKair Carriers
- IP QoS/CoS mapping to ATM QoS at the Base Station eliminates the need for multiple rooftop outdoor units.
- QoS using IETF standard in differential service (diffserv). Supporte different Modulastions according to the type of CPE, from 64 QAM to GFSK
- Fast packet-based data transmission and toll quality for delay and jitter sensitive telephony.
- Easy-to-use SNMP-based remote management system, enabling simple unit configuration and multiple simultaneous unit upgrading.

## AlvariBase components

### Base Station Equipment

The AlvariBase™ Station Equipment is comprised of the following elements:

### Outdoor Equipment

#### • WALKair Sector Antenna

The antenna is a sector type. It covers an angular area at 90o, 60o or 45o. Several sector antennas (4, 6 or 8), each with its own RFU, may cover a whole service area (cell). Each sector antenna is connected to an RFU through an RF Coaxial Cable

#### • WALKair RFU-BS

The RFU converts the IF to RF, amplifies the signal to its right level and transmits it through the antenna. It is mounted near the antenna. The RFU is connected to the indoor equipment via a single coax cable. The RFU is capable of transmitting and receiving up to 8 different combined carriers, the total transmitted power per RFU when using both systems is 27 dBm.

## Indoor Equipment

#### • IF-MUX

The IF-MUX combines the IF signals from and to the various BUs and AUs and 48VDC into a -single coax cable that goes up to the rooftop, where the RF and antenna subsystems are located. Up to 8 BUs and AUs may operate together combined by the same IF-MUX.

#### • BS-BU

The BS-BU connects a specific WALKair carrier to the backbone through one ore more out of the three existing interfaces, V35/X21, E1 or Ethernet. The network interfaces of the BS-BU are: E1, E1-FR, V35/x.21, V35/X21 - FR and Ethernet Port. Each BU contains an Ethernet port for Network Management purposes and a serial LCI port for local craft terminal.

#### • BS-SH / BS-SH-OF

Base Station Shelf and the BS-PS Base Station Power Supply module. The BS-SH is a 3U shelf suitable for installation in 19" racks or for desktop mounting. The BS-SH can house up to six active BS-AU Access Unit modules and one or two BS-PS Power Supply modules. Two additional slots can be used to accommodate spare BS-AU modules, or can be used for future use by other modules. The BS-PS is powered from a -48 VDC power source. Power supply redundancy is supported through the optional use of a second BS-PS module.

#### • BS-AU / BS-AU-OF

The AU connects a specific BreezeACCESS carrier to the backbone through its 10BaseT Ethernet port. The network interface of the AU is a 10BaseT connector. Management of AU is done in-band through TELNET protocol or SNMP. The AU units are installed vertically inside the BS-SH. The BS-AU-OF can be installed side by side with BS-AU, the Radio of the OFDM system is collocated in the same sector with WALKair multi carrier radio.

## AlvariBase CPEs

The range of CPEs varies from the typical MultiService CPE (WALKair) with up to three different telecom port using a TDMA air protocol, to the Data and Voice CPEs using IP protocols and VoIP (BreezeACCESS GFSK) and ending with the high capacity OFDM CPE (BreezeACCESS OFDM) which allows cheap and easy installation taking advantage of its Orthogonal Frequency Division Multiplexing (OFDM) and its high capacity throughput thanks to its high modulation techniques and adaptive rate (64 QAM, 16QAM, QPSK and BPSK)

## WALKair, The Multi Service TS

### Terminal Station-Base Unit (TS-BU)

The TS-BU interfaces between the CPE and the WALKair TS RFU/Antenna, using the TDMA protocol to handle traffic to and from the BS. Supporting up to three interface cards, the TS-BU delivers a wide range of advanced voice and data services. The TS-BU is connected to the TS RFU/Antenna via a single coaxial cable, and can be easily mounted in a rack or on the wall, or fit conveniently on a desk. Once the IF signal reaches the RFU, it is converted to RF. Each BU contains up to three telecom interfaces, such as E1, V35/X21, Ethernet10/100BaseT and ISDN-BRI, providing diverse voice and data services. The interface cards are installed on daughter boards, enabling maximum flexibility. Each BU contains an LCI port to be used by the local craft terminal for installation and maintenance purposes.

The TS is powered either by a DC standard source (48V) or an AC source to the Indoor Unit.



## BreezeACCESS GFSK, The Data and Voice CPE

### BreezeACCESS XL CPEs - Crafting customer connectivity

The BreezeACCESS XL series of Customer Premises Equipment (CPE) features both data plus voice and data-only capabilities. The BreezeACCESS XL CPEs connect to the subscriber's data equipment via a standard IEEE 802.3 Ethernet 10-BaseT (RJ 45) interface. Telephony services are supported using a standard POTS (RJ 11) interface connected directly to the subscriber's telephone.



### Desktop Units

Optimized for indoor installations, the SU-R Subscriber Units are simple to install, reducing time and cost of installation. The convenient and compact unit fits easily on a desktop or can be mounted on the wall. With 28 dBm power output at the antenna port, the SU-R feature several antenna options, as follows:

- **Flat panel antenna models:** Feature 17 dBi gain for external installation.
- **Wall mountable antenna models:** Feature 7 dBi gain and include 3 meters of antenna cable, for indoor or outdoor installation. Models with dual 4 dBi omni antenna are also available.

## Indoor/Outdoor Units

The BreezeACCESS XL indoor/outdoor option includes an indoor desktop or wall-mountable unit and an outdoor antenna and radio unit. Data, power, management and control signals are transmitted from the indoor unit to the outdoor unit via a coaxial cable.

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

- **SU-A units:** Comprise a radio module and integrated flat panel antenna.
- **SU-E units:** Include a radio module and RF connector for a separate external antenna.



## BreezeACCES OFDM, The High Capacity, non Line of Sight CPE

### 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 with either an integrated flat panel antenna or a connector for an external 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.

