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BreezeACCESS VL

BreezeACCESS VL Version 5.1 (900 MHz Band)

Release Notes

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1 Introduction

BreezeACCESS VL version 5.1 introduces a new product family supporting the 900 MHz frequency band in accordance with FCC regulations, and some new features. This document provides a summary of the new products and features. For detailed information please refer to the applicable sections in the System Manual and Country Codes documents.

Note that since this is a new frequency band using a new Country Code, 900 MHz units cannot be downgraded to a SW version below 5.1.

2 Frequency Band and Country Code (Regulatory Domain)

The new product family (HW Revision F) uses a new Country Code - FCC 900 MHz, supporting operation in the 900 MHz frequency band (902-928 MHz) with 5 MHz channels and frequency resolution of 0.5 MHz.

The maximum output power of units operating in the 900 MHz band is:

Modulation Level	Maximum Tx Power (dBm)
1 – 3	27
4	26
5	24
6	22
7	20
8	19

For compliance with relevant regulatory requirements, the maximum EIRP is 36 dBm.



3 Available Products

BreezeACCESS VL 900 family includes the following products:

3.1 Modular Access Units:

P/N	Name	Description
809710	AU-E-BS-900-VL	BreezeACCESS VL Access Unit. Package includes stand alone Indoor Network Interface for chassis + Outdoor radio unit, 902-928 MHz supporting 5MHz channel OFDM. Antenna, antenna jump cable and indoor to outdoor CAT-5 cable are not included (cable PN: 811593).
809711	AUS-E-BS-900-VL	BreezeACCESS VL Access Unit. Limited to 8 SUs (SU-3 and/or SU-8). Fully upgradeable to standard AU. Complete access unit kit, includes: stand alone Indoor Network Interface for chassis, Outdoor radio unit, 902-928 MHz supporting 5MHz channel OFDM. Antenna, antenna jump cable and indoor to outdoor CAT-5 cable are not included (cable PN: 811593).

3.2 Stand-Alone Access Units:

P/N	Name	Description
809712	AU-E-SA-900-VL	BreezeACCESS VL Access Unit. Package includes standalone Indoor Network Interface + Outdoor radio unit, 902-928 MHz supporting 5MHz channel OFDM. Antenna, antenna jump cable and indoor to outdoor CAT-5 cable are not included (cable PN: 811593).
809713	AUS-E-SA-900-VL	A complete Standalone access unit base station.that can serve up to 8 SUs (SU-3 and/or SU-8). Fully upgradeable to standard AU. Complete access unit kit, includes: stand alone indoor network interface, outdoor radio unit, 902-928 MHz supporting 5MHz channel OFDM. Antenna, antenna jump cable and indoor to outdoor CAT-5 cable are not included (cable PN: 811593).

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3.3 Subscriber Unit:

P/N	Name	Description
809701	SU-E-900-3-BD-VL	Outdoor Subscriber Unit for detached antenna. Includes: Indoor Network Interface Unit, Power supply, Outdoor radio unit with N type antenna port, 902-928 MHz OFDM, Full Data Bridge 3Mbps upgradeable to 8Mbps with PN 858178. Antenna, antenna jump cable and indoor to outdoor CAT-5 cable are not included.
858178	SU-3 to SU-8 upgrade	Upgrade SU-3 to SU-8

3.4 Base Station Antennas:

90° V/H Antenna: 2x10dBi typical, 902-928 MHz, dual vertical/horizontal polarization, 90° AZ x 16° EL for Vpol, 90° AZ x 19° EL for Hpol.

Omni Antenna: 7dBi typical, 902-928 MHz, 360° AZ x 17° EL, vertical polarization.

3.5 Subscriber Antenna:

Flat panel antenna, 10.5 dBi minimum in the 902-928 MHz band, 55° AZ x 60° EL, vertical/horizontal polarization.

4 New Features and Improvements

4.1 Improved Noise Floor Calculation Mechanism

The Noise Floor calculation mechanism incorporated in the units is used for estimating the level of the noise floor. This value is used for estimating SNR values and for decisions on existence of signals in the channel. In some cases, especially when a very strong signal exists in neighboring channels, the noise floor calculated by the built-in mechanism may be significantly below the actual noise floor level.

The new feature enables setting a minimum level for the Noise Floor: If you experience problems in the wireless link such as excessively long association process or very low throughput, it may be caused by

errors in noise floor calculation. In this case, it is recommended to perform a Spectrum Analysis and view the calculated Average Noise Floor values. If the calculated Noise Floor is lower by more than 5 dB from the expected value (-102 dBm for 5 MHz channels), it is recommended to change the calculation mode to Automatic with Minimum Value (rather than the Fully Automatic default mode), using the expected value as the minimum (Forced Value). Refer to the Limitation section for more details on using this feature.

4.2 Improved Display of Spectrum Analysis Results

Additional measurement results have been added to the Spectrum Analysis Display:

- **Signal Max SNR:** The maximum SNR of signals (excluding OFDM frames with the correct bandwidth) in the channel.
- **OFDM SNR:** The average SNR (in dB) of OFDM frames received in the channel.
- **OFDM Max SNR:** The maximum SNR (in dB) of OFDM frames received in the channel.
- **Noise Floor Avg:** The average Noise Floor (in dBm) calculated for the channel.
- **Noise Floor Max:** The maximum Noise Floor (in dBm) calculated for the channel.

4.3 Continuous Noise Floor Display

For enhanced support of trouble shooting, a continuous display of the calculated Noise Floor value used by the unit is available.

4.4 Continuous Average SNR/RSSI Display

The previously available Continuous Average SNR Display has been enhanced to continuously display also the Average RSSI.

4.5 RSSI Information Display

In the AU, the Average RSSI for each associated SU has been added to the MAC Address Database (Show Association Info).

In the SU, the Average RSSI for each available AU has been added to the Show Best AU Parameters option.



5 Documentation

BreezeACCESS VL documentation includes the System Manual for BreezeACCESS VL version 5.1 and related documents, installation support documents, and this release notes. The most updated documentation is available for download from the customer service section of the Alvarion web site.

Note that although the documentation covers all BreezeACCESS VL bands and Country Codes, SW Version 5.1 is currently available only for units in the 900 MHz band using FCC 900 MHz Country Code.

6 Important Notes

- Although minimum output power is defined as -10 dB when configuring the Tx Power manually, when ATPC is enabled the SU's output power may be less than this minimum.
- Extra care should be taken when configuring VLAN management and management IP filtering in order not to lose connectivity with unit. In case of connectivity loss, use the "restore default parameters" application to reset to factory values.
- In case data encryption is used, the maximum number of SUs that can be served by an AU is limited to 124 (512 when data encryption is not used). Note that when data encryption is needed, it must be used by all SUs served by the same AU, as well as by the AU itself. The Maximum Number of Associations in the AU must be set to 124 or lower to enable data encryption. As long as data encryption is enabled, the Maximum Number of Associations cannot be set to a value higher than 124.
- When Wireless Link Prioritization feature is activated the prevention of Low Priority Traffic Starvation is automatically disabled.



- Remote changes of the Maximum Modulation Level in an SU while Adaptive Modulation is disabled may lead to lose of connectivity with the unit. The recommended workaround is to enable Adaptive Modulation, reset the unit to apply the change, and then change the Maximum Modulation Level.
- Adaptive Modulation may not converge to best modulation in some setups with high variance in noise levels. In these cases better performances may be achieved with manual modulation settings (Adaptive Modulation Disabled).
- When using the Q-in-Q feature the units can be managed by a management station behind the AU only if the following conditions are met:
 - The unit can be managed only with tagged frames: VLAN ID – Management must be other than 65535 (None).
 - To enable proper management, all units in a cell (the AU and all SUs served by it) must use the same VLAN ID - Management.
 - The VLAN ID – Management must differ from the Customer's VLAN ID - Data.
- Using FTP to put/get some files into/from the units might fail. However, the operation will succeed after several trials. In such cases it is recommended to use TFTP for the same file transfer.
- SNMP management was checked with SNMPC version 5.1.11e.
- AlvariCRAFT configuration tool is available on the CD.

7 Limitations

- Sensitivity may change slightly as a function of frequency (+/-2dB).
- Transmission power accuracy is +/-1dB above 8dBm @ antenna port (typical condition). At lower levels the accuracy is +/-3dBm, never contradicting regulations. At very low levels the use of ATPC may cause significant fluctuations in the power level of the transmitted signal.



When operating at such low levels, it is recommended to disable the ATPC Option in the SU and to set the Transmit Power parameter to the average Tx Power level before the ATPC was disabled.

- When encryption is used by the Authentication Algorithm (Shared Key option), in large cells (more than 80 SUs) the association process may be relatively long.
- The Country Code Learning by SU feature does not function with the default ESSID (ESSID1).
- MAC Address Deny/Allow List supports maximum 100 entries.
- Calculated distance in 5MHz channels might not be accurate when very long ESSID strings are used. The presented distance may be higher than the real one. It is preferred to keep the ESSID short (up to 10 characters).
- The character “;” (semicolon) is a reserved character. It should not be used in defining any string parameters (unit name, ESSID, etc) since the string will be cut before the semicolon.
- If you are using the Feature Upgrade option in Telnet to enter a license string using copy and paste operation, check carefully that the string is copied properly. You may have to enter it manually due to potential problems in performing copy/paste in Telnet.
- On the AU side, when the Tx power is set to a values above 24dBm the downlink traffic sent at high modulation levels can be transmitted with higher power than the theoretically defined value. In such cases, this throughput may be affected by an excessive number of CRC errors, followed by retransmissions. To address this situation, the RTS threshold in the AU should be set to 60 (default value in VL-900). When Tx power on AU side is 24dBm or bellow (i.e. when using antennas with gain higher than 12) the RTS threshold can be increased to 4092.
- When operating in “Fully Automatic” Noise Floor Calculation mode some errors in noise floor calculations may show values for Noise Floor significantly bellow -102dBm. In such cases it

is recommended to set the Noise Floor calculation to “Automatic with Minimum Value” with a Forced Value of -102dBm.

- It is not recommended to force the noise floor to more than 15-20dB above the measured value. This might affect the SNR calculation (showing much higher values) for signals that are up to 10dB above the new Noise Floor forced value.
- When operating in noisy environments it is recommended to manually tune the Noise Immunity Control mechanism.
- ANI – unlike other VL family products, the VL900 ANI register are disabled by default.
- BreezeACCESS VL 900 system is designed to operate in clear line-of-sight link conditions. However, operation in near-line-of-sight or non-line-of-sight conditions can be achieved at shorter distances and certain favorable path propagation conditions, given that link performance degradation is accepted. Signal quality at longer distances and/or through severe obstructions can be seriously degraded, up to the point where a link cannot be obtained.

- **Detailed review of the VL 900 Installation Application Note is mandatory in order to perform a correct and efficient unit installation.**