



BreezeMAX™ FDD

7 MHz – Generic Migration Process

**SW Version 3.5
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DN1002**

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1 Scope

The purpose of this document is to explain the BreezeMAX FDD network migration procedure to a 7 MHz channel bandwidth. This document explains the migration procedures in general and does not describe the details of a specific Migration Plan.

The document focuses on the hardware and software aspects of the migration and not on the Radio Planning. However, new Radio Planning is required according to Alvarion's BreezeMAX FDD guidelines.

The process of downgrading to 3.5MHz or older versions than Release 5.0 is detailed in Appendix B.

2 The Need

High bandwidth demand has become a well known fact today. Starting from BreezeMAX FDD Release 5.0 (software version 3.5), customers who have available frequency channels and would like to increase the BreezeMAX FDD system capacity now have the possibility to migrate their networks from a 3.5MHz to a 7 MHz channel bandwidth, almost doubling BreezeMAX FDD system capacity.

A migration plan is required in order to enable switching the wireless access network from one channel bandwidth to another with minimum disruption of the services and network downtime.

3 Migration Process Requirements

Before starting the migration procedure, it is important to note that only the BMAX-BST-AU-IDU-4CH FDD (Figure 1), BMAX-MBST-IDU-4CH FDD (Figure 2) and dual mode CPE support the 7 MHz channel bandwidth.



Figure 1: BMAX-BST-AU-IDU-4CH



Figure 2: BMAX-MBST-IDU-4CH

This means that in order to upgrade the BreezeMAX FDD channel bandwidth to 7 MHz, it is mandatory to replace the 2 IF HW with 4 IF HW and all non Dual Mode CPEs.

For information on how to validate that the CPEs are Dual-Mode please refer to Appendix A.

Before starting the migration procedure, it is mandatory to upgrade the entire BS including Dual Mode associated CPEs to GA software version 3.5 (Release 5).

This document describes the high-level process of the migration explaining all the steps that must be followed for one BS migration. A detailed migration plan including frequencies allocation and site migration order to avoid interference has to be made separately for each area (or city) taking into consideration the special characteristics of the area. It is highly recommended to scan for interference in all available frequencies before starting the migration process.

4 7 MHz Migration Process Steps

This migration procedure assumes that all the installed CPEs are associated and are manageable. All CPEs disconnected during the migration procedure must be locally reconfigured and upgraded to SW 3.5 after the migration procedure has been completed.

It is highly recommended using of the AlvariSTAR NMS for this migration procedure. This will significantly reduce the network downtime and migration procedure complexity.

Steps to be followed:

1. Check that all installed CPEs are Dual Mode (refer to Appendix A). All non Dual Mode CPEs must be replaced before system migration starts.
2. Prepare the BMAX-BST-AU-IDU-4CH FDD card or the BMAX-MBST-IDU-4CH FDD unit.
3. Upgrade the BreezeMAX FDD access system to software version 3.5. First all CPEs must be upgraded to software version 3.5, then the BS components.

Firmware upgrade can be done using AlvariSTAR/AlvariCRAFT or TFTP application. Before the upgrade procedure, make sure that you have the appropriate FDD SW package stored on your computer.

When using AlvariSTAR/AlvariCRAFT, the maximum number of simultaneous software upgrade sessions is five. Prior to uploading the SU firmware to the BST, verify that no more than 2 SU firmware files already exist on the flash. The same applies for the AU regarding the Modular Base Station.

4. Verify that the NPU/AU/MBST and all the SUs have SW version 3.5 in their main file.

5. Create a full backup configuration file on the management PC.

**NOTE**

Units operating with software version 3.5 will accept backup file only from units operating with the same software version. During this step, the IF channels must be enabled.

6. Choose one SU from each AU as a reference SU and note the following parameters value: Uplink SNR/RSSI, Downlink RSSI/SNR, Tx power.
7. Modular BST: replace all 2-IF-AU cards of the BS-SH with the new 4-IF-AU cards, then check new configuration consistency. If during this step the IF channels are disabled; it is mandatory to restore the full backup configuration file at the end.

Micro BST: install and power up the 4 IF Micro BS. Upload the full backup configuration file on the new Micro BS HW, then check the new configuration consistency.

**NOTE**

The IF cable can be connected/disconnected from the AU card/MBST only after card extraction (when all LEDs are off).

8. Manually reset each AU card/Micro BS, then check new configuration consistency.
9. Check that all CPEs are associated and no major errors are reported by the BS.
10. After approximately 5 minutes, verify that the reference CPEs SNR/RSSI values are similar to the values measured for the 2-IF-HW.
11. For each AU's IF channel select all the associated CPEs and using the Multiple Configuration feature of AlvariSTAR, configure the new channel bandwidth and the new frequency value if is required. Then reset all the associated CPEs. If AlvariSTAR is not available, this procedure can only be performed per CPE increasing the sector downtime.

**NOTE**

Only IF channel 1 is supported.

12. After reconfiguring all associated SUs (for both IF channels) wait 1-2 minutes and check that no CPEs are associated to the AU.
13. Disable the AU's IF channels, configure the new channel bandwidth (and new frequency values if required), then enable the IF channels. Due to a known bug, the frequency change and channel enabling has to be done in one step (one Apply).
14. Check that all CPEs are associated and manageable.

15. After approximately 5 minutes, verify that the reference CPEs SNR/RSSI values are with average of 3-4 dB lower than the values measured for the 3.5 MHz channel bandwidth.

**NOTE**

In case of BS where interference can occur until during the migration procedure the reference values has to be checked after the whole migration procedure has been completed.

16. Repeat steps 10-14 for each IF channel of each AU card of the BS.

Appendix A. BreezeMAX FDD CPEs Classification

As mentioned above, only Dual-Mode CPEs are capable of operating in 7MHz channel bandwidth.

To determine if the CPEs in your network are Dual-Mode, check your CPEs' Part Numbers against the Part Numbers in the following lists:

Table 1: Dual-Mode CPE PNs

735124xx, 735125xx, 735126xx, 735127xx, 733140xx, 733141xx, 733150xx, 733151xx, 736144xx, 736145xx, 736146xx, 736147xx, 735144xx, 735145xx, 735146xx, 735147xx, 735180xx, 735181xx, 735182xx, 735155xx, 735175xx, 735176xx

Table 2: Single Mode CPE PNs

733110xx, 733112xx, 733113xx, 733115xx, 735110xx, 735111xx, 735112xx, 735704xx, 735705xx, 735706xx, 733120xx, 733121xx, 733122xx, 733123xx, 733130xx, 733131xx, 733132xx, 733133xx, 735113xx, 735114xx, 735115xx

Table 3: Mixed-Single/Dual Mode CPE PNs

735120xx, 735121xx, 735122xx, 735123xx, 736120xx, 736121xx, 736122xx, 736123xx, 735150xx

All the CPEs in Table 1 are Dual-Mode and support 7MHz. All the CPEs in Table 2 are single mode and cannot be used in 7MHz. The CPEs in Table 3 that have been used in early shipments were single-mode capable hardware and in later shipments were dual-mode capable hardware.

If you have CPEs in your network that belong to the 3rd group (mixed dual/single) you may find if they are single or dual mode by querying the hardware revision of each CPE:

	Single Mode		Dual Mode	
	Digital HW	RF HW	Digital HW	RF HW
SU-ODU	13,14,15	13,14,15	13,14,15	11,12
SU-SI	6,7	13,14,15	6,7	12

The unit RF HW and Digital HW version are displayed in CPEs general parameters, Hardware Information field (Telnet, AlvariSTAR, AlvariCRAFT).

Appendix B. Downgrading to 3.5 MHz or Older Version than Release 5.0

The new BMAX-BST-AU-IDU-4CH FDD and BMAX-MBST-IDU-4CH FDD are supported as of Release 5.0 (software version 3.5) only. Earlier software versions do not support these hardware.

To downgrade to 3.5MHz:

1. For each AU's IF channel, select all the associated CPEs and using the Multiple Configuration feature of AlvariSTAR, configure the new channel bandwidth and the new frequency value if required. Then reset all the associated CPEs. If AlvariSTAR is not available, this procedure can only be performed per CPE, increasing the sector downtime.
2. Disable the AU's IF channels, configure the new channel bandwidth and new frequency values if required). Then enable IF channels. Due to a known bug, the frequency change and channel enabling must be done in one step (one Apply).
3. Check that all CPEs are associated and are manageable.

The process of downgrading to earlier versions than Release 5.0 can be done only in systems operating with 3.5 MHz channel (before SW downgrade it is mandatory to downgrade the system to 3.5 MHz).

To downgrade the SW version:

1. Downgrade all SUs to SW release 3.0.
2. For systems operating with 2 IF HW: downgrade the BS to SW version 3.0
3. For systems operating with 4 IF HW: replace the 4 IF HW with 2 IF HW then downgrade to software version 3.0
4. Configure the 2 IF AU card with proper frequency, channel bandwidth, sector ID, etc.