

ADSConfig User Guide

Introduction

The ADSConfig application is designed to allow either the ADS Tech or Silabs USB tuners to be configured ready for use with the USBRadio DLL developed by Beezer, Guino and Pete on the digital car forum.

The application performs two main functions:

- Configures the non-volatile flash memory area in the tuner which specifies FM frequency band, channel spacing and other RDS features.
- The uploading and downloading of the firmware within the tuner. This is particularly relevant to the ADS Tech tuner which has a firmware bug which caused erratic power up and a modulated noise tone that can be heard on quite stations. Revised firmware included with the application corrects this.

Initial Setup

The USBRadio DLL currently comes in several versions, one of which supports dual tuners to allow the full benefit of EON RDS features to be used (in future this should also allow TMC reception). This guide covers setup for both single tuner and dual tuner installations.

The main difference between single and dual installations is that in the dual installations the DLL needs to be able to identify which is the primary and which is the secondary device. To cater for this, two versions of firmware are provided, one for the primary tuner (the one you listen to) and one for the secondary tuner (the one used for background RDS functions). In a single tuner installation only the primary radio firmware should be used.

NOTE : While using the ADSConfig application only a single tuner should be plugged in at a time.

Firmware

The application ships with four versions of the firmware:

- “Silabs Standard.dec” : The standard Silabs firmware - use this if you want to restore your ADS Tch device back to the factory code.
- “ADS Standard.dec” : The standard ADS Tech firmware - use this if you want to restore your Silabs device back to the factory code.
- “ADS NoiseMod_Primary.dec” : Modified code for the ADS Tech tuner. Cures the noise problem and makes it look like a Silabs (PID/VID and audio string) so that the DLL treats it as the primary tuner.
- “ADS NoiseMod_Secondary.dec” : Cures the noise problem for the ADS Tech tuner.

All the firmware files are in a custom .dec format. This was initially for simplicity during development. The files are NOT checksummed so file corruption will not be detected. Modify them at your own risk, unless you know what you are doing you will put your tuner into an unrecoverable state.

There is a very slim risk that downloading new code could leave your tuner in an unusable state (if the .dec file is corrupted or your PC crashes during the download). If this happens then a IC

programmer will be needed to fix it (~£20 to buy or ask me when I'm in a really good mood). Personally I have not had this happen at all, nor have I heard of this happening to others but I felt I had to warn you just in case.

Firmware Updating

Firmware Choice

The following firmware combinations should be used :

Single Tuner

ADS Tech tuner : Use the “ADS NoiseMod_Primary.dec” firmware

Silabs tuner : do not change, use factory code

Dual Tuner

2 x ADS Tech : Load the ADS NoiseMod_Primary.dec into the first tuner and load the “ADS NoiseMod_Secondary.dec” into the second tuner.

2 x Silabs : Leave the Silabs running factory code and load the “ADS NoiseMod_Secondary.dec” into the ADS Tech tuner.

1 x ADS Tech + 1 x Silabs : Leave the Silabs running factory code and load the “ADS NoiseMod_Secondary.dec” into the ADS Tech tuner.

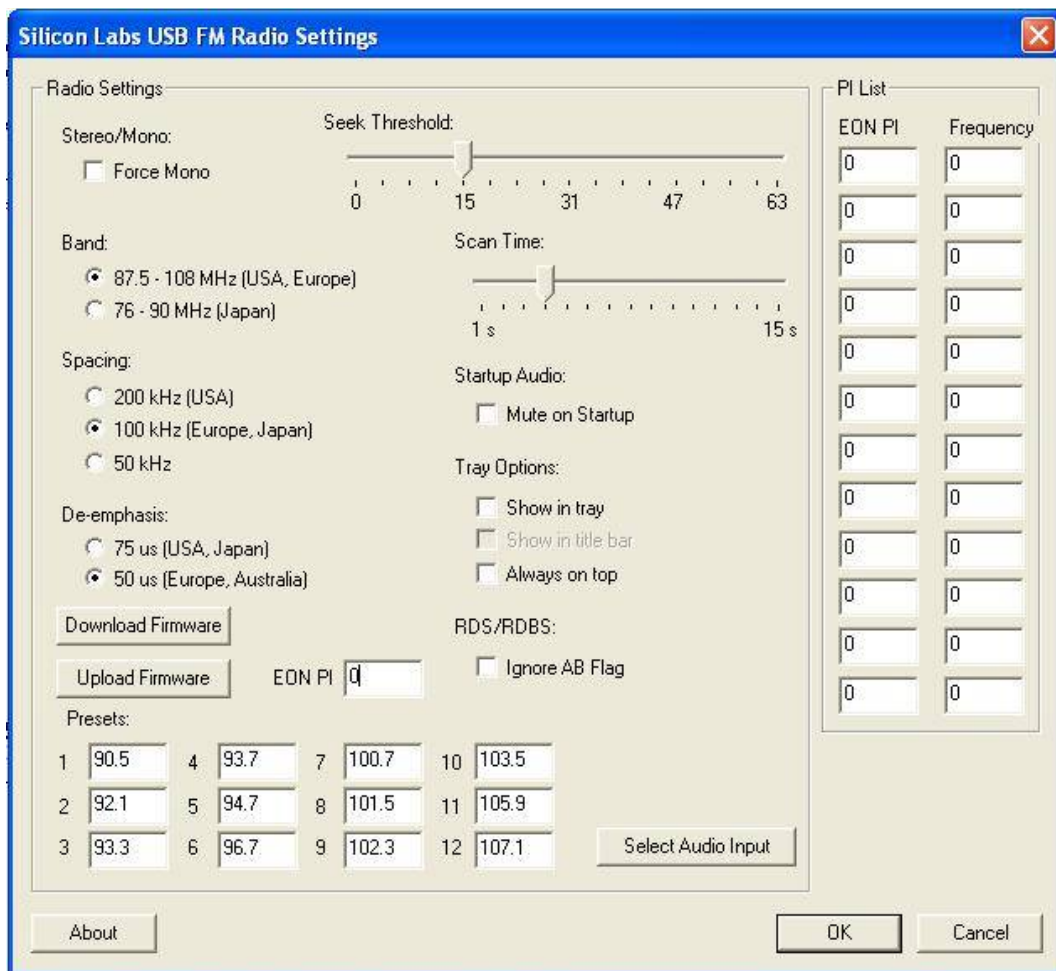
Firmware Download

Now you know which code to use follow the process below to download it into the tuner:

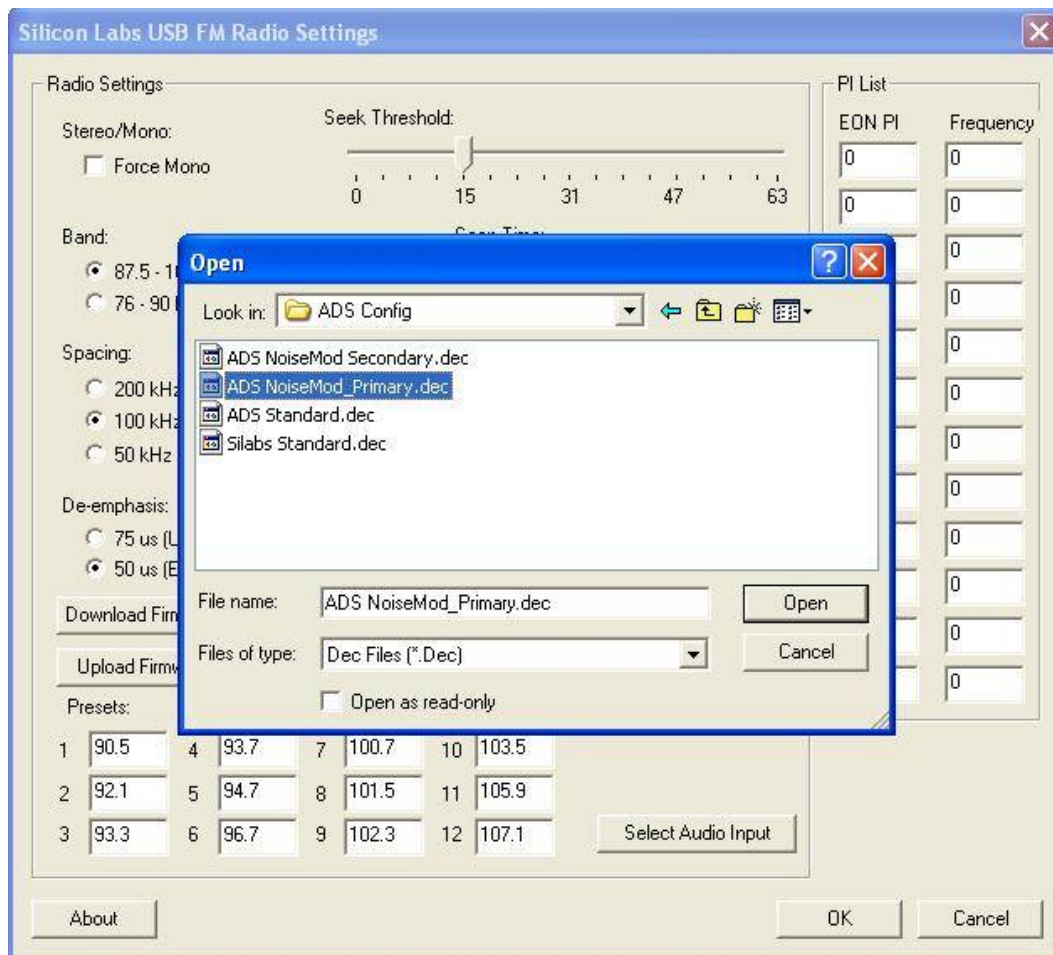
Open up the ADStech application, it should look like this.



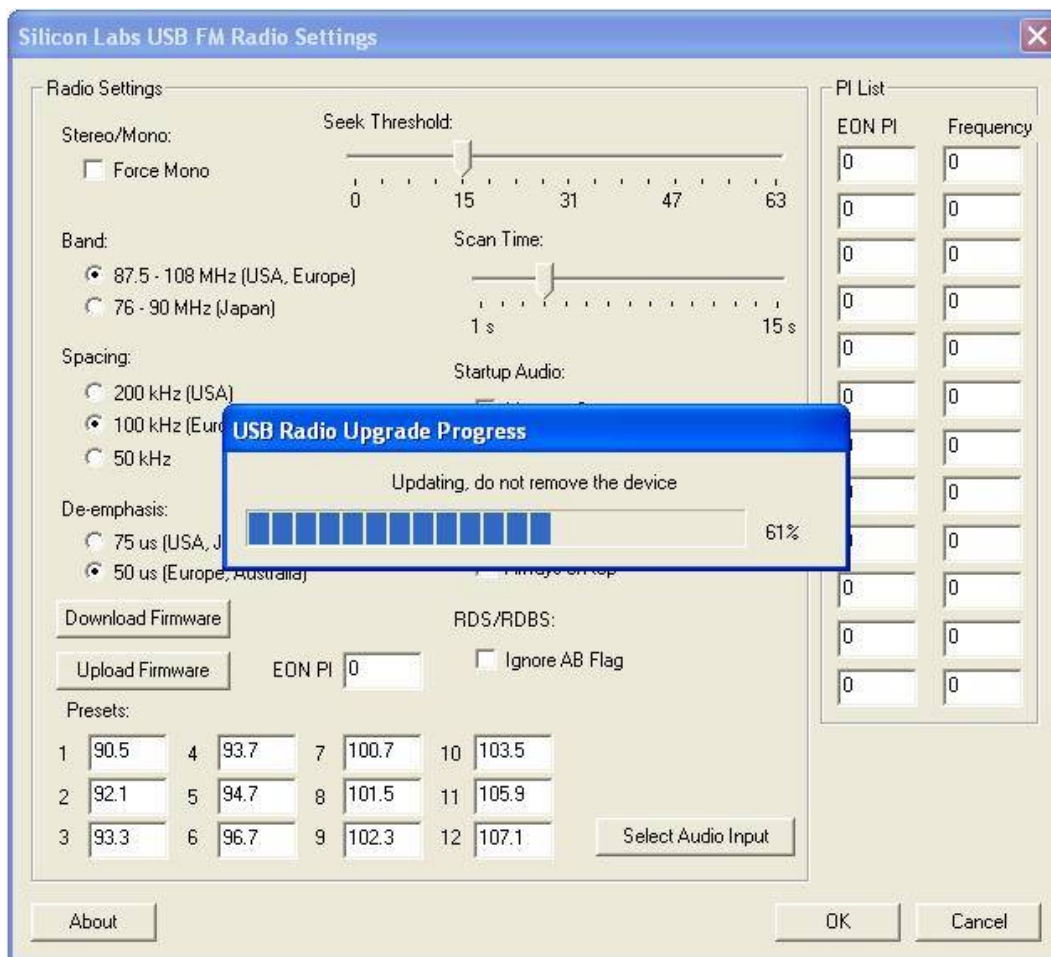
To download go to the settings screen by pressing the “Settings” button, you should then get a screen that looks like this.



Now hit the “Download Firmware Button” and the file selection screen should appear.



Select the appropriate file, hit “Open” and a download progress dialog should show as the new firmware downloads.



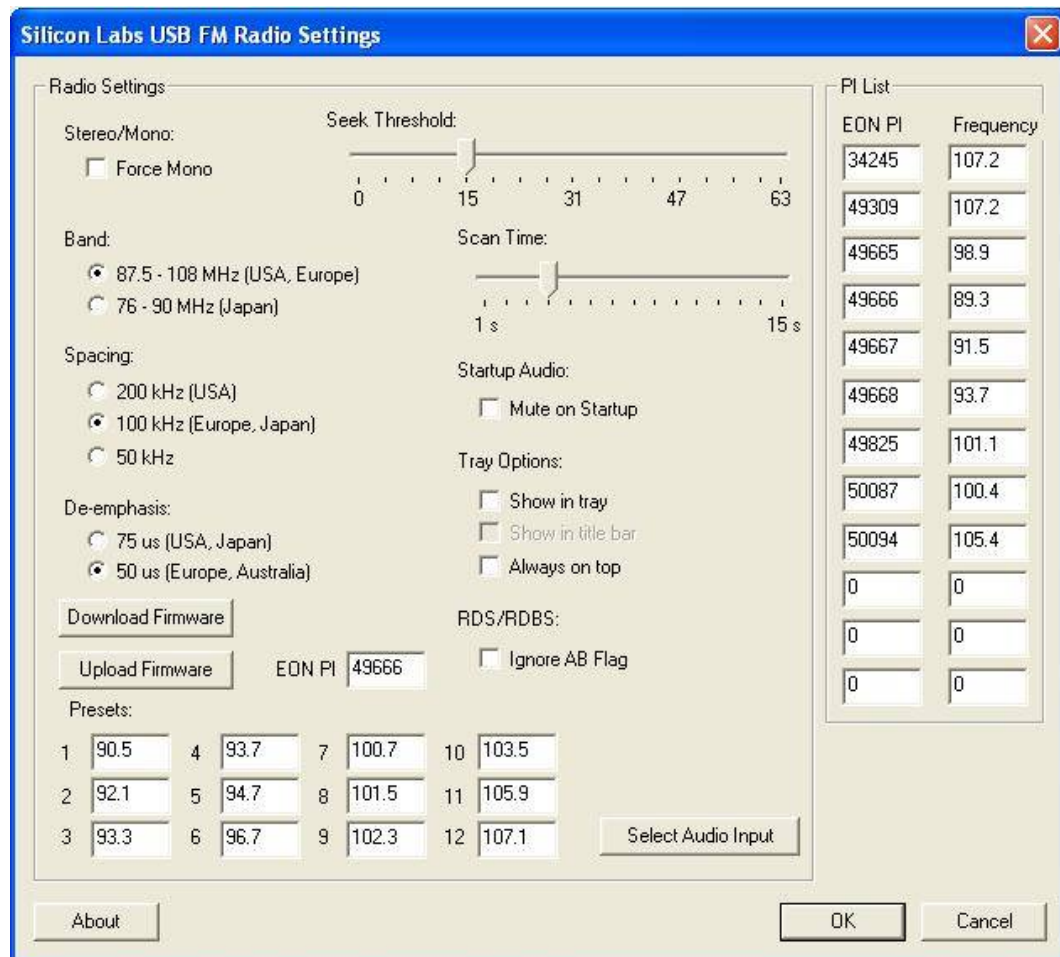
When this completes, the main screen will again be displayed. If an ADS Tech has been updated to look like a Silabs it will be necessary to exit and restart the ADSConfig application before sound can be heard.

Your tuner firmware has now been updated. If you are using dual tuners, mark up the tuner to show whether it is the primary or secondary.

Configuration

It is now necessary to configure each tuner; the amount of configuration is dependant on whether you want to use EON TA, this document assumes that you do. If not just skip the EON bits.

Once you have updated the firmware, plug one tuner in at a time, start the ADSConfig application and go to the settings screen.



The picture above shows a tuner fully configured for use in the UK with recommended seek thresholds. A few notes on the less obvious fields:

Seek Threshold : The lowest signal strength that the tuner will consider a station when scanning up or down, 15 seems to be a reasonable level which finds most stations without picking up noise.

Band, Spacing and De-emphasis : Just set appropriately for you location, these set up the FM receiver side of the tuner.

EON PI : This is relevant to dual tuner set ups and is the Program Identification code for the station that will be used by the secondary tuner to pick up EON TAs. In the UK the national stations seem to work best (Radio1 : 49665, Radio2 : 49666, Radio3 : 49667) but any station that sends EON TAs will do. For use in other countries it's a case of trying different stations to see what happens, you can use Debugview to get a better idea of what works but I'm not going to go into that here. If you find one that works well please let me know so that I can add the details here.

PI list : This is a list of all the stations that can be received locally and is used by the tuner when

switching stations to receive and EON TA and for AF tuning. You can either manually set it up now if you know the PIs and frequencies or let the DLL do it (and just use this screen to see what it's found). In dual tuner setups twelve stations are stored in the primary tuner and another twelve in the secondary tuner.

Populating the PI List

NOTE : Only the dual tuner DLLs support this feature.

NOTE : Currently the dual tuner versions of the DLL have a checksum on the memory within the tuner. If this checksum is invalid they will not use the memory contents and instead revert to defaults. Unfortunately other version of the DLL do not save this checksum and any settings that they write to the tuner memory are treated as invalid by the dual tuner DLLs. If you regularly switch between DLLs then you will need to repeat this process whenever you move from a non dual tuner DLL to a dual tuner DLL. Future versions of the DLL will correct this.

Single Tuner

Plug in the tuner and start up an application that uses one of the dual tuner version of the USBRadio DLL, the ADSConfig app does not use this and cannot be used. Manually scan through the entire band pausing on each station until the RDS stream comes in (on weak stations this may never happen so give up after around 30sec on a station). When complete close the application you used, start up ADSConfig and check the list has been updated.

NOTE : A single tuner can only hold 12 stations. These should be local regional BBC stations in the UK as they are the ones that are required to receive the EON TA.

Dual Tuner

Plug in the tuners and start up an application that uses one of the dual tuner version of the USBRadio DLL, the ADSConfig app does not use this and cannot be used. Leave the application running for 15-30 minutes. Close the application you are using, unplug the tuners. Plug the tuners in one at a time and use ADSConfig to check the PI List to see what stations have been found.

The DLL stores stations in priority order, the higher priority is given to stations that are regularly used to pick up TAs and can be reliably received. High priority stations are stored in the primary tuner, lower priorities in the second. If you can not pick up many stations do not be surprised if there are no PIs listed in the secondary tuner.

The DLL will continue to look for new PIs as you continue to listen and drive around and so the PI list will grow and change with time, for example the frequency listed for each PI is the strongest one found on the last scan and will change as you move from region to region.

Final Notes

In single tuner use the EON TA will only work if you normally listen to a station that sends EON data (national stations in the UK).

The benefits of a dual tuner installation are that it allows you to listen to a station that does not transmit EON data (typically local commercials stations in the UK) while still receiving EON data on the second tuner. It also allows AF switching to take place with virtually no noticeable interruption to the sound. In the future TMC reception should also be possible.