AFEDRI SDR 192kHz firmware upgrade process description.

1. Attention!!! Please run SDR Control software before firmware upgrade process beginning. Switch to tab "About" and write value of "Front End Main Clock Frequency", to restore this value in the future, after upgrade. This value can differ between AFERDI SDR.

2. Please connect AFEDRI SDR to Personal Comuter USB port directly, try do not use external USB HUB USB!!!

3. Download from web site of STMicroelectronics file archive um0412.zip that contains "DfuSe USB Device Firmware Upgrade" targeted for AFEDRI SDR firmware upgrade:

   http://www.st.com/internet/com/SOFTWARE_RESOURCES/SW_COMPONENT/FIRMWARE/um0412.zip

4. Install "DfuSe USB Device Firmware Upgrade" on personal computer.

5. Download latest version of firmware from site http://4z5lv.net/index.php/downloads/category/1-firmware-downloads

6. Extract firmware archive to any folder of your choice.

7. Disconnect USB cable between SDR and Personal Computer (PC).

8. Put shortcut jumper on J4 - "Boot" (two contacts)

9. Connect the AFEDRI SDR 192K to PC. After reconnection the SDR to PC , operational system will find the new USB device and possible error message boxes will be shown and warnings that New found USB device does not function properly. It is normal process, and Windows will install proper driver in the end of process. Similar messages will be shown in the future when using SDR switched to firmware upgrade (boot) mode – it is normal. If STMicroelectronics DFU Utility has been installed properly, everything will work OK.

10. Run one of two utilities "DfuSe Demonstration" or "STDFU tester" (on your choice). I recommend to use "DfuSe Demonstration", it has more convenient user interface and easy to use, but I have

problem to run this program on one of my computers (don't know why, may be libraries conflict or so). For example on notebook Dell Latitude E6400 with Windows XP SP3 installed, the program "DfuSe Demonstration" is stopping right after start with "Run time error". On other PCs there is no similar problems exists. So if you have problem with "DfuSe Demonstration", there is alternative - "STDFU tester", but remember - it is less user friendly.

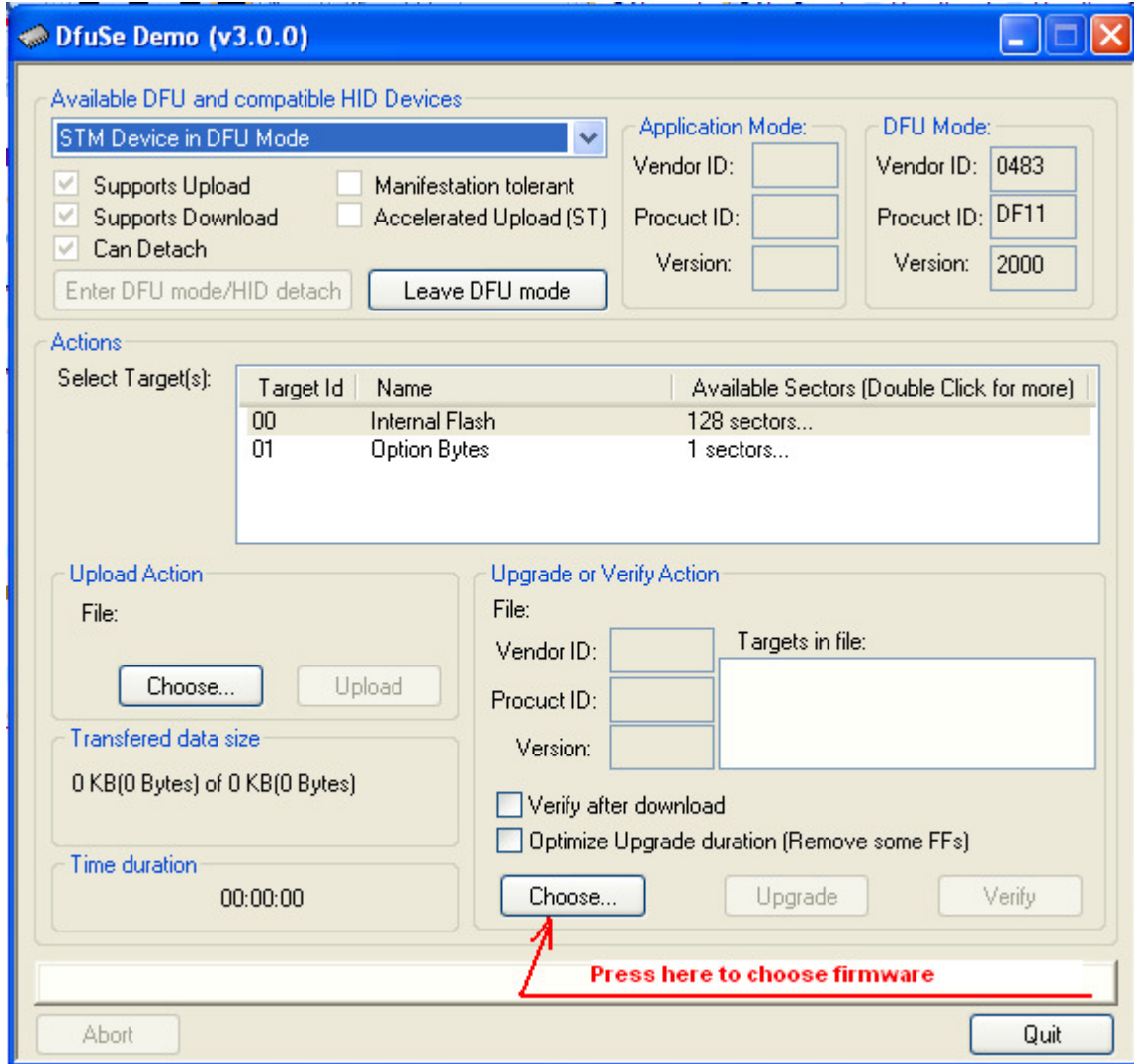10.1. **Short instruction of firmware update process using "DfuSe Demonstration".**

Figure 1 Screen shot of DfuSe Demo

10.1.1. Run DfuSe Demo program.

10.1.2. Please pay attention on information that is shown in the "Available DFU and compatible HID Devices" list box (up left corner of application window). If all sequence, described above, was done right a found devices will be listed, like on Figure 2 (STM Device in DFU Mode). If "STM Device in DFU Mode" device is shown in list box, it tell that AFEDRI SDR is successfully run in "boot" mode and ready to firmware update.

10.1.3. If you want that application will check code downloaded to microprocessor you can check check-box "Verify after Download" It is located in Upgrade or Verify Action area in right bottom part of application window.

10.1.4. Go to "Upgrade or Verify Action" area (right bottom part of application window). Press "Choose" button to find and define firmware .dfu file, that you want to flash.

10.1.5. After proper firmware file was defined, press button "Upgrade".

10.1.6. When the button was pressed, you can see some additional Message Box is appearing. It contains Message like on Figure 2. Press "Yes" to continue.
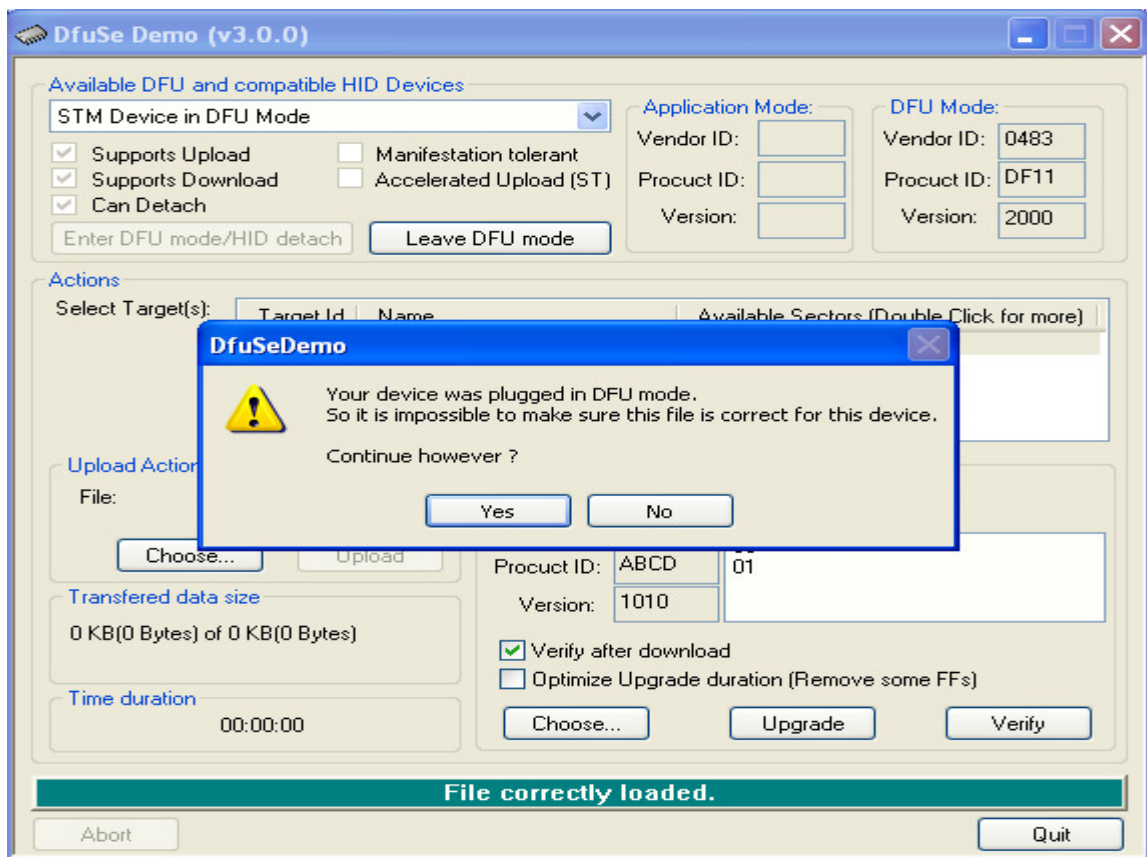

Figure 2

3

10.1.7. It takes number of seconds to finish upgrade. If everything is going right you will see success message in the end of process..

10.1.8. Remove jumper from J4 – "boot"

10.1.9. Disconnect USB cable between SDR and PC and reconnect it afterward.

10.1.10. If firmware upgrade process was successful then AFEDRI SDR ready to use, but...

10.1.11. After firmware upgrade you need check current firmware version and stored "Front End Main Clock Frequency" value. It is can be checked using SDR Control application in "About" tab.

10.1.12. If you have found that "Front End Main Clock Frequency" value is 0 (Hz) or 79999999 (Hz) , then you need restore right clock value using SDR Control application. It is impossible to use SDR when this value is wrong!!! The sequence is next:

10.1.12.1. Run SDR Control application

10.1.12.2. Switch to "Command shell" tab.

10.1.12.3. Input needed frequency value in "Main Clock Input" text box, use number that you have wrote before upgrade beginning (see. paragraph 1.)

10.1.12.4. Store new "Main Clock Input" value pressing button "Change Main Clock"

10.1.12.5. If you wish you can store desired "Sample rate", input its value in "Command Input" text box and press button "Change sample rate".

10.1.12.6. All the changes is applied only after AFEDRI SDR USB cable reconnection!!!

10.2. **Short instruction of firmware update process using "DFU Tester" application** .

10.2.1. Run "DFU Test" application.

10.2.2. Please pay attention on information in the list box "Devices" (upper part of application window). If all sequence described above was done right there will be listed found devices list like on Figure 3 (STM Device in DFU Mode). If "STM Device in DFU Mode" is shown in list box, it tell that AFEDRI SDR is successfully run in "boot" mode and ready to firmware update

10.2.3. Press button "Create from Map", wait till the end of software initialization, this strange process is needed to erase old firmware from the flash.

4

10.2.4. Check the check-box "Erase" located in "Operation" area (left side of the application window), and press button "Go" afterward. Wait number of seconds till process is finishing.

10.2.5. Usually you will see "Success" message.

10.2.6. Press button "Load DFU File" and choose file that contains new firmware.

10.2.7. Check "Download" check-box in "Operation" area and press button "Go"

10.2.8. Wait number of second to finish.

10.2.9. Further sequence is similar to described in paragraphs 10.1.6 and below.

Attention!!! When using DFU tester application for firmware upgrade you have to restore right value of "Front End Main Clock Frequency" see paragraph 10.1.12.
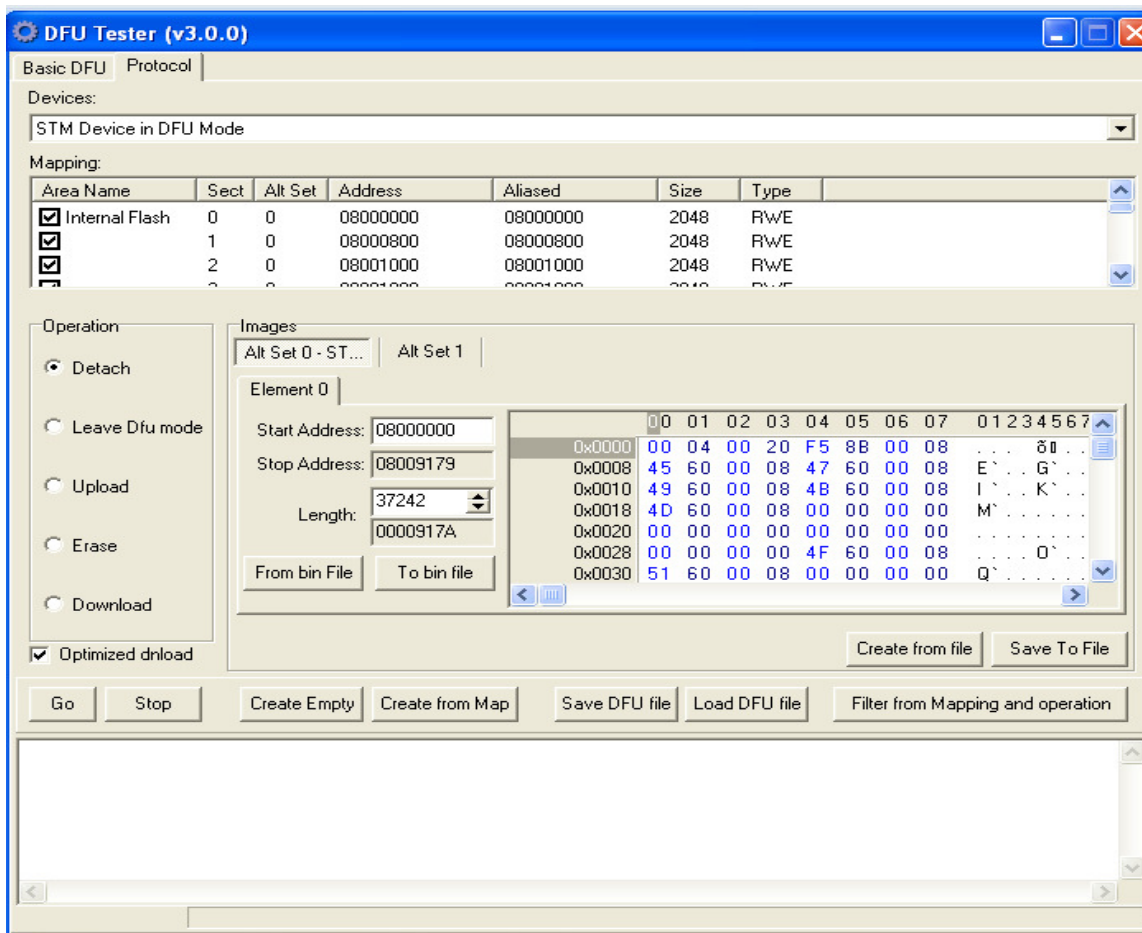

Figure 3 Копия экрана программы DFU Test

10.3.   This paragraph is applicable to "old" hardware (Rev.0) only

In old versions of AFEDRI SDR PCB (rev.00), to put microprocessor to "boot" mode that needed for firmware upgrade, you need to solder short-cut jumper between pins 11 and 16 of U6, if this chip is soldered on PCB, or to solder short-cut jumper between pins 11 of U6 any pin connected to 3.3V voltage (VCC3V3D) for example pin of inductor L5.