



# BETA RELEASE NOTES and ERRATA

## PowerSDR™ 2.0.6

July 22, 2010

This release of PowerSDR 2.0.6 is a BETA release for use with the FLEX-1500, FLEX-3000 and FLEX-5000 transceivers. Please check the list of updates and changes below as well as the known problems list before upgrading to 2.0.6. Please report any issues found in the FlexRadio bug tracker at <http://www.flex-radio.com/support>

### UPDATES AND CHANGES IN THIS RELEASE:

*Reported Bugs and issues fixed in this release (since 2.0.5)*

- DE197 FLEX-5000 TX1/2/3 sequencing verified
- DE180 VU5K: RX only checkbox is now remembered properly on HF and XVTR bands
- DE177 VU5K: VU Band names now show up correctly on band buttons
- DE178 VU5K: HF/VHF panel switches appropriately when going from HF to VHF+ bands and vice versa
- DE89 ATU log file now located in correct %APPDATA% location (2803, 2832, 2745, & 2874)
- DE164 VOX control hidden since it is not supported on FLEX-1500
- DE101 HF Drive setting is no longer changed unintentionally when using XVTR bands (2868)
- US46 Custom installer now includes option to change install directory (for PowerSDR components) (2821)
- US12 FLEX-3000 Transmit Bandwidth increased to high limit of 4.5kHz
- US58 Added Variable buffer blanking on TR switching for FLEX-1500 – Setup Form -> Transmit Tab
- US40 Allow sidetone level adjust using AF control for FLEX-1500 – requires firmware v0.4.1.4
- DE174 FLEX-1500 AM and FM transmit frequency are now correct and XIT works (2916 + 2911)
- DE172 FLEX-1500: VAC Direct I/Q now works (2921)
- US53 FLEX-1500 Fwd Power now reads in percent
- DE80 Default Leveler value rationalized (prior versions were setting to 15dB when the control said 5dB)

### **KNOWN PROBLEMS:**

- DE240 VAC Transmit on the FLEX-1500/SDR-1000 is not functioning
- DE242 FLEX-3000 ATU will not tune on Windows 7-32 or 64-bit unless running as Administrator
- DE239 AM carrier level varies +/- 12dB with modulation
- DE237,
- DE243 Spurs may be visible in some modes other than CW (2865, 2795)
- DE228 Noise blanker on FLEX-1500 does not function

### **FLEX-1500 OPERATION NOTES**

1.) Testing and field reports on earlier releases have established that operation and performance of this software is best with Windows 7. The reasons are that Windows 7 comes with a new low latency sound card driver called Windows WASAPI, that provides lower latency and better stability than any other Windows operating system. It also provides driver and USB port management that is friendly and essentially transparent, significantly improved relative to the two other operating systems.

Comparing Windows 7, XP and Vista, Vista has been the most troublesome. Instructions for use with all three Windows Operating systems are included below, but if you install this software under Vista, and are having difficulty or continuing problems, we will recommend that you upgrade to Windows 7, rather than continuing to fight Vista.

2.) CW Operation: As before, you can send CW with a straight key plugged into the key jack, an external keyer plugged into the key jack, or use the built-in CW keyboard software. All of these options will work well.

To use the built-in iambic keyer, we recommend that you use the Windows WASAPI audio (Sound Card) drivers in Windows 7. In Vista or XP you **MUST** download and install ASIO4ALL as described below in Section 6.

We recommend the smallest audio buffer settings (SetUp\Audio\Primary) that provide un-distorted audio and smooth keying. These will reduce latency to a minimum. The exact settings are dependent on your computer hardware.

3.) **Under Windows 7**, after running the installer, turn on the radio and allow the drivers to load. Then open PowerSDR, but **prior** to pressing the “START” button (upper left part of the window) for the first time.

- Go to SetUp\Audio
- Under Drivers, select “Windows WASAPI”
- Under Input, select “Microphone FLEX-1500”
- Under Output, select “Speakers FLEX-1500”
- Exit the screen.

This need only be done the first time the software is installed and set up.

4.) **Under Windows XP**, after running the installer, turn on the radio and allow the drivers to load, open PowerSDR, but **prior** to pressing the “START” button (upper left part of the window) for the first time.

Go to SetUp\Audio  
Under Drivers, select MME  
Under Input, select “Microphone FLEX-1500”  
Under Output, select “Speakers FLEX-1500”  
Exit the screen.

This need only be done the first time the software is installed and set up.

If you wish to run the **internal iambic keyer under Windows XP**, you will need to download and install ASIO4ALL as described below in section 6, and select ASIO instead of MME as the audio driver. ASIO4ALL has noticeably lower latency and delay when using the iambic keyer.

5.) To use PowerSDR version 2.0.6 with **Windows Vista**, you **MUST** download an extra sound card driver named “ASIO4ALL” from

<http://www.ASIO4ALL.com>

Download the latest version ASIO4ALL 2.10.

Run the PowerSDR 2.0.6 installer and follow the instructions.

Prior to opening PowerSDR, power up the FLEX-1500 radio, and allow the FLEX-1500 drivers to install.

Run the downloaded “.exe” file from ASIO4ALL.

When you reach the page for selection of components to install, also select “Off Line Settings” for download.

**Prior** to running PowerSDR, start and run “Off Line Settings”, by going to (Computer) START/All Programs/ASIO4ALL/ASIO4ALL Offline Settings

In this “Off Line Settings” application,

Click “FLEX-1500”

Adjust the ASIO Buffer size to 256 bytes.

(You may also try 128 and 64 bytes. Do NOT use intermediate values.)

(Do not set the PowerSDR\SetUp\Audio\Primary buffer smaller than the ASIO buffer.)

Close the application.

Now, open PowerSDR.

Go to SetUp\Audio

Under Drivers, select ASIO

Under Input and Output, select ASIO4ALL

Exit the screen.

Now press the “START” button for normal operation of PowerSDR.

If you are unsuccessful getting PowerSDR 2.0.x to operate acceptably under Vista, our recommendation will be that you upgrade to Windows 7. Results in field testing so far, have been mixed.

6.) The IF offset default is set to 9 kHz in this software release. This causes the centering of the received passband to be slightly off to the side. If you want better centering, you may check the "Expert" box in SetUp/General/Hardware\_Config and set the IF in Hz to some value between 500 Hz and 5000 Hz for better centering.

7.) The USB driver for this radio will "steal" the audio for the computer, such that when this radio is plugged in, the speaker sound for the computer will come out of the radio speakers/ headset jack. It also means that any sounds the computer makes or is playing back will be sent out the radio when transmitting.

To prevent this, go to (in the computer) START/Control Panel/Sounds and set your existing/internal sound card as the "Default."

This issue will be fixed in a future release by replacing the sound drivers for the radio, such that the radio is no longer recognized as a sound card by the computer. Although no sound card is involved, and this radio does not require a separate sound card, the radio currently appears to the computer as a sound card, and most computers will send the sound to the last sound card to appear, unless the default assignment as described above is made.

8.) The SPUR REDUCTION (SR) control is default "ON." The frequency span of the Panadaptor screen will be wider with SR turned off. Since there are extremely few spurs visible on the FLEX-1500, the recommended normal use of SR is "OFF."

9.) To deal with the few milliseconds of noise that are sometimes sent at the first dit of a session in CW, or the beginning of a transmission in SSB, a new feature has been added to PowerSDR called a "Blanking control." This a temporary solution until the new custom drivers are available in a future ".dot" release.

This is located at SetUp/Transmit, in the lower left, labeled FLEX-1500. The window is in units of milliseconds, with a default of 200 (milliseconds.)

This feature mutes the speaker and transmitted signal for the time shown during change over from receive to transmit, or transmit to receive.

If a noise burst is heard at the beginning of a transmission, you may increase this value. The value may be reduced to speed up receive to transmit switching times, if no noise burst is being heard.

Understand that the optimum value is different for different systems, and will change with different buffer size settings. If you are running different buffer settings for

different modes, you will have to either change this setting when switching modes, or set it at the largest setting for any of the modes.



## RELEASE NOTES and ERRATA

### PowerSDR™ v2.0.19 RC1

February 18, 2011

***IMPORTANT: Read this document in its entirety before installing the new release.***

PowerSDR v2.0.19 is a public BETA release for use with the FLEX-1500™, FLEX-3000™ and FLEX-5000™ transceivers. Please check the list of updates and changes below as well as the known problems list before upgrading to v2.0.19. Please report any issues found in the FlexRadio bug tracker at <http://support.flex-radio.com/BugList.aspx?it=b>.

#### **SUMMARY OF UPDATES AND CHANGES:**

*(NOTE: A Detailed changelog.txt file can now be found in the \Documentation Directory)*

1. We have completely redesigned CW functionality from the ground up on all FLEX-XX00 series radios. Specific emphasis was placed on minimizing latency and jitter to produce high performance CW using both attached paddles and external keyers. Note that SDR-1000 users must read the SDR-1000 Operating Notes below regarding changes in CW operation.
2. Fixed bugs in Noise Reduction (NR) and Automatic Notch Filter (ANF) operation.
3. FLEX-3000 and FLEX-5000 transmitter local oscillator DDS now turned off when in receive mode to eliminate spurs from the transmitter.
4. Integrated FireWire driver version 3.5.5.10185. This version fixes a CPU performance issue on Windows 7 machines.
5. Optimized standard filter cuts for digital modes.
6. Corrected several RF signal routing errors for FLEX-5000-VU5K radios. Specifically, this addresses the use of the XVTR port.
7. Improved FLEX-1500 and further automated USB driver installation.
8. Added USB buffer control to optimize USB update rate on PC configurations with problematic chip sets.
9. Improved PTT Out control for all FLEX-Series radios.
10. Several fixes to CAT commands.
11. Added W5WC high contrast, 2D Gray Skin
12. Numerous bug fixes and enhancements for each radio (see Change Log).

## **KNOWN ISSUES:**

1. FMN mode incorrectly handles audio pre-emphasis and de-emphasis of signals. This will be fixed in PowerSDR v2.1.x along with the addition of Repeater offsets, CTCSS tones, and repeater memory channels.
2. Pulse width modulation (PWM) of the fan in the FLEX-3000 can occasionally cause clipped CW elements when using an external keyer. This does not affect the internal keyer or COM port keying.
3. A few combinations of audio buffer and receiver DSP buffer sizes can cause distortion on NR and ANF. In such case, increasing the audio buffer size or decreasing the receiver DSP buffer size should stop the distortion. If you want to keep the buffer settings, try reducing the number of Taps on NR and ANF to 50.
4. On FLEX-VU5K models, the scale of the Drive slider is currently non-linear.

## **DATABASE IMPORT RECOMMENDATIONS**

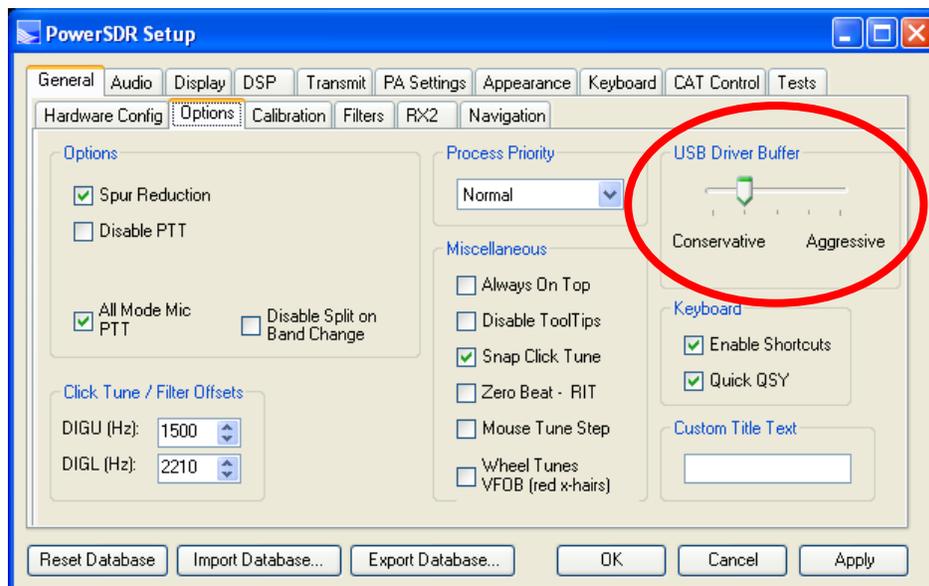
We highly recommend starting with a clean database when upgrading from previous versions. If you import an old database, please proceed with caution because a number of important parameters have changed.

## **FIRMWARE UPGRADE PROCEDURE**

Beginning with PowerSDR v2.0.16, drivers and firmware are both automatically installed as part of the installation process. Do not attempt to manually install a driver or firmware update unless specifically requested by FlexRadio Customer Support.

## **FLEX-1500 OPERATION NOTES**

1. Performance optimization: The FLEX-1500 utilizes a real time driver to communicate between PowerSDR and the radio via USB. There are two steps to optimize the streaming performance of the USB interface. This varies by PC. Just because you have the fastest processor out today does not automatically mean that your PC's USB controller will achieve maximum performance. We have created a control to match the USB driver buffer streaming to your specific hardware. There are two steps to this process.
  - a. USB Driver Buffer control: The USB Driver Buffer control allows optimization of the low level USB stream. This control is found on the Setup/General/Options form as seen below. *Note that PowerSDR must be in standby in order to change this control.* The default setting has been chosen to allow successful startup of PowerSDR on most machines but may not provide optimal performance on your specific PC. More aggressive settings reduce latency and improve keying performance in CW. More conservative settings will allow lower performing USB controllers and/or CPUs to function smoothly. Choose the most aggressive setting that provides stable operation without popping or distortion of the received signal.



- b. Audio Buffer Size: We recommend use of the smallest audio buffer setting on the Setup/Audio/Primary form that provides un-distorted audio and smooth keying. These will reduce latency to a minimum. The exact settings are dependent on your computer hardware but will usually be 512 or 256.
2. The IF offset default is set to 9 kHz in this software release. This causes the centering of the received passband to be slightly off to the side. If you want better centering, you may check the "Expert" box in Setup/General/Hardware Config and set the IF in Hz to some value between 500 Hz and 5000 Hz for better centering.
3. The SPUR REDUCTION (SR) control is default "ON." The frequency span of the Panadaptor screen will be wider with SR turned off. Since there are extremely few spurs visible on the FLEX-1500, the recommended normal use of SR is "OFF."

### **FLEX-5000 and FLEX-3000 OPERATION NOTES**

1. If the FLEX 3.5.5.10185 FireWire driver fails to load properly after installing PowerSDR v2.0.19, it will prevent previous version(s) of PowerSDR from working correctly. On rare instances, a previous FireWire driver install can prevent the Integrated Installer from properly installing the FireWire driver. If this condition exists after installing PowerSDR v2.0.19, remove all previous FireWire driver installations and perform a new driver installation by running the following procedure.
  - a. Shut down PowerSDR and power off your software defined radio.
  - b. If the FLEX FireWire control panel is open, close it.
  - c. Run the PowerSDR v2.0.19 Integrated Installer and select the REMOVE option.
  - d. Using the Windows Control Panel, select the Remove Program applet.
  - e. Look for any instances of the FLEX FireWire driver. They will be listed as FlexRadio 3.5.2.8028 or FlexRadio 3.5.0.7171. Remove all instances of the FlexRadio FireWire driver.
  - f. Reboot your PC.
  - g. Run the PowerSDR v2.0.19 Integrated Installer Suite setup program.
  - h. After the PowerSDR v2.0.19 Integrated Installer has completed, reboot your PC if requested.
  - i. After the PC has completely booted up, power on the FLEX-x000 and allow the FireWire driver to complete its installation. For Vista and Win7 operating systems this is performed silently without any user intervention. For XP systems, the user will have to confirm three sub-driver installations (see the PowerSDR v2.0 Quick Start Guide for your particular SDR for additional details on installing the FireWire driver).

- j. Verify that the FireWire driver is properly installed by opening the FLEX FireWire Driver Control Panel. The FLEX-x000 should be a recognized device.
  - k. Start PowerSDR v2.0.19 and proceed with the initial setup wizard.
2. You can run a FLEX-x000 SDR and a FLEX-1500 on the same PC at the same time as long as you use separate databases for each radio. A new “Chooser” will appear to allow you to select which radio you would like to operate. The software now keeps track of the database files for you. Just click “USE” next to the radio you want. If USE is grayed out, then check to make sure the radio is properly powered up. NOTE: Currently you must start the FLEX-1500 FIRST for multiple radios to be run. Also, you can only have 1 USB-based radio and 1 FireWire based radio operating at one time.

### **SDR-1000 OPERATION NOTES**

The new CW keyer provided in PowerSDR versions starting with v2.0.19 require a microprocessor inside the radio to achieve the real time performance levels needed for break-in CW using attached paddles. The SDR-1000 does not incorporate such a microprocessor. Therefore, beginning with v2.0.19, attached paddles are no longer supported on the SDR-1000. From this point forward CW paddles are supported on the SDR-1000 only through the use of COM port keying. Please refer to the SDR-1000 Operating Manual pages 138-140 for setup and operation using this method.



# PowerSDR™ v2.5.3 Release Notes

December 10, 2012

**IMPORTANT: Please read this document in its entirety before installing the new release of PowerSDR 2.x.**

PowerSDR v2.5.3 is a general release intended for use with the SDR-1000™, FLEX-1500™, FLEX-3000™ and FLEX-5000™ software defined radio transceivers.

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## PowerSDR 2.5.3 Installation Information

### PowerSDR 2.x Software Installation/Upgrade Recommendations and Guidelines

Please read all of the following guidelines and follow the recommendations to ensure a trouble free upgrade of your software defined radio to PowerSDR v2.5.3.

The instructions below are applicable for users that already have *a previous version of PowerSDR v2.x* installed on their PC. **If you have the older PowerSDR v1.x installed, please see the Prerequisites for FLEX-x000 Users Upgrading from PowerSDR 1.x to PowerSDR 2.x in the section below.**

1. Minimum required CPU for PowerSDR v2.5.3 and greater is an Intel Pentium IV and an AMD Athlon 64 / Operon and greater. Lesser processors do not have the necessary SSE2 compatibility needed for the DSP.
2. The minimum version of Windows supported by PowerSDR v2.5.x and above is Windows XP Service Pack 3 (SP3). If your Windows XP PC has not been upgraded to SP3, you must do so before installing PowerSDR v2.x. See Minimum Windows and .NET Requirements below for obtaining Win XP SP3.
3. It is **not necessary or recommended** to uninstall any previous versions of PowerSDR 2.x before installing PowerSDR v2.5.3. In fact, it is not recommended that you uninstall previous versions of PowerSDR unless you uninstall **all** previous versions so that files and drivers installed as dependencies with previous versions are all properly removed before installing PowerSDR v2.5.3
4. It is **not necessary or recommended** to manually remove the Firewire driver before installing PowerSDR v2.5.3. Doing so after PowerSDR v2.5.3 is installed will make your FLEX-5000 / FLEX-3000 inoperable. Do not install any standalone versions of the Firewire driver either.
5. The PowerSDR v2.x installer requires administrator level rights to install the kernel mode device drivers for the various SDR radios. The Installer should automatically elevate to this level of rights when run regardless of the current user rights, but if you are in doubt that your login has full administrator rights or you are getting errors indicating files cannot be found, you need to right click on the PowerSDR v2.x Integrated Installer icon and select the "Run As..." option and run the Installer with the administrator account, and not your login account ID.
6. The PowerSDR v2.x Installer no longer prompts the user for radio options. All drivers are now pre-loaded to eliminate the need to re-install a version of PowerSDR in order to load a device driver.
7. Firmware updates, if needed, are applied automatically when running the new version of PowerSDR for the first time. Do **not** stop the firmware installation until it has fully completed or your radio may not operate properly thereafter.
8. See additional operation notes regarding your specific model radio later in this document.
9. If you are installing a FlexControl with PowerSDR v2.5.3 **for the first time**, please read the *FlexControl Installation Errata Sheet* shipped with the FlexControl regarding use with Virtual Serial Port software prior to installation. You may need to remove any existing virtual com port pairs you have defined before installing PowerSDR and the FlexControl drivers. This is not necessary if you have an existing operational FlexControl connected to your PC.

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## Minimum Windows and .NET Requirements

PowerSDR 2.x is a Windows 32-bit .NET application designed to operate on Windows XP SP3, Vista, Windows 7 and Windows 8. The .NET 3.5 SP1 Framework is required.

As of July 13, 2010, Windows XP SP2 (service pack 2) is no longer supported or actively updated by Microsoft, therefore if your PC is running Windows XP SP2, you must install Service Pack 3 (SP3) before installing PowerSDR v2.5.3. The PowerSDR 2.x Integrated Installer will check for this dependency and inform you if your PC does not meet the minimum XP Service Pack requirements.

For more information regarding upgrading your PC to Windows XP SP3, refer to [Learn how to install Windows XP Service Pack 3 \(SP3\)](http://windows.microsoft.com/en-US/windows/help/learn-how-to-install-windows-xp-service-pack-3-sp3) (<http://windows.microsoft.com/en-US/windows/help/learn-how-to-install-windows-xp-service-pack-3-sp3>) on the Microsoft web site.

If you need to install the .NET 3.5 SP1 Framework, the PowerSDR 2.x Integrated Installer will try and download the necessary software from the Internet or the installation CD. Alternately, you can download it directly from Microsoft using this web link before running the PowerSDR Integrated Installer: <http://www.microsoft.com/en-us/download/details.aspx?id=25150>

## Obtaining Technical Support

If you encounter any issues installing or operating PowerSDR v2.5.3 with FlexRadio's software defined radios, please contact FlexRadio Systems technical support by opening a HelpDesk ticket on-line at <http://helpdesk.flexradio.com> or by phone at +1 (512) 535-4713 extension #2. Please leave a voice mail message if you don't get an answer as all of our engineers are probably busy on existing calls.

**Hours of Operation.** Our Technical Support engineers are available Monday – Friday from 8:00am-5:30pm Central Time. If you call after business hours, on a holiday or weekend, please leave a detailed message and we will return your call in the order it was received during regular business hours.

You may always submit a HelpDesk support ticket at any time.

If you need assistance opening a HelpDesk ticket, please refer to the following web page for detailed instructions. <http://support.flexradio.com/>

## New Improvements and Changes in PowerSDR v2.5.3

*NOTE: A detailed changelog.txt file can be found in the Documentation folder under the FlexRadio Systems Windows Start menu for PowerSDR v2.5.3*

### New Features

- 1. New FlexControl Basic and Advanced Operation Modes.** A new basic operation mode for FlexControl operation has been added for users that desire a single action assigned to each AUX button and the knob on the FlexControl knob, so that a single click of an AUX button modifies the assigned radio control that the knob changes. If XIT or RIT is assigned to an AUX button, double clicking that AUX button will reset XIT or RIT back to a zero (0) Hz offset. In Basic mode, the LED indicators above the AUX buttons will illuminate if that specific control is selected. If no LEDs are illuminated then the action assigned to the knob is active. The FlexControl Basic mode is now the default mode.
- 2. Waterfall Low/High Levels by Band.** When you set the waterfall low/high levels in the Setup form, those levels are saved in the database for the active band and recalled when you select that band again. The waterfall low/high level settings are saved for 160-6m, WWV, Gen and all transverter bands. For users with a FLEX-5000 + RX2, since the RX1 and RX2 waterfall displays are not independent, the RX2 band's waterfall settings are inherited from the settings saved for RX1 and are set based on the current RX1 band.
- 3. Windows 8 Compatibility.** Necessary changes have been made to ensure that the PowerSDR Integrated Installer properly installs PowerSDR v2.x on Windows 8.
- 4. Audio File Name Enhancement.** Whenever you create a pre-processed or IQ audio file using the Wave form, the designation "IQ" is now included in the file name.
- 5. New Keyboard Commands.** A new keyboard command has been added to control the Drive setting (ALT+ "+" to increment / ALT + "-" to decrement). Note you must use the "+" and "-" keys located in the keyboard number pad to activate this control.
- 6. Disable Split on Mode Change.** A new user selectable Setup option has been added to disable Split if you change modes. The default setting is unselected (unchecked).
- 7. Disable NR, ANF and Noise Blankers for Digital Modes.** When selecting DIGU or DIGL, if NR, ANF, NB or NB2 are enabled, they will be turned off to prevent adverse interaction with ASFK digital mode programs.
- 8. Default AGCT Settings Refactored by Band for Better SNR.** The default AGC-T settings by band have been refactored (changed) to provide a better AGC performance (improved SNR) due to natural noise floor characteristics of the different bands.
- 9. New FHM-1 TX Profiles.** Two new default transmit profiles have been added specifically created for the new FlexRadio FHM-1 hand microphone. The FHM-1 profile is intended for use with FHM-1 microphone's tone setting in position 1 (default) which delivers a full range audio frequency response, whereas the FHM-1 DX profile is intended for use with the FHM-1 microphone's tone setting in position 2 producing communication quality audio for DX and contesting.

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## Enhancements and Bug Fixes Incorporated in Release v2.5.3

DE759: 1500: Fixed defect where RF frequency would not changed when changing VFO during TX  
DE762: AGC: AGC-T value not set properly when AGC setting changed to Fixed. Default now 75  
DE745: Bandplan: Fixed defects on 60m band text and band stack for Norway 60m operation  
DE749: CAT: Fixed a UHE when using the ZZSA / ZZSB / ZZSG / ZZSH commands  
DE750: CAT: Fixed Preamp setting Pre2 not supported through CAT Interface for the FLEX-3000  
DE755: CAT: Fixed a bug where the ZZBA and ZZBB commands were not working properly  
DE707: CAT: Fixed ZZPC to prevent drive setting change if tuning  
US1279: CAT: Added PR command to prevent a race condition with HRD  
US448: Console: Default AGC-T settings by band are refactored for better SNR  
US517: Console: Selecting DIGU or DIGL turns off NR, ANF and NBx that may interfere with ASFK  
US1250: Console: Added keyboard commands to increment and decrement the DRIVE control  
DE748: Console: Fixed a bug where BIN not re-enabled after using AM, SAM or FM if TX VFO-B active for RX1  
US1286: DSP: Changed default NR and ANF settings for improved performance  
US1255: FlexControl: Added new Basic operation mode that simplifies setup and operation  
DE764: FlexControl: Fixed FlexControl auto detect state not being saved in the database  
DE761: Installer: Modified 1500 & FC driver install/uninstall batch files to run autonomously on Win8  
DE758: Panadapter: Fixed frequency heading display rounding error at 1,2,4,8 MHz, etc..  
US1285: Profiles: Added new FHM-1 profile for the FlexRadio hand microphone (FMH-1)  
US93: Setup: The waterfall high/low levels now saved by band  
US1276: Setup: Option added to disable Split on mode changes  
DE739: Setup: Fixed a bug where the default TX profile could be deleted resulting in a UHE  
DE746: VAC: Fixed VAC1 Auto enable on digital modes did not include DRM  
DE747: VAC: Audio streams reset on TX change to VFO-A for DIGx & DRM if VAC auto enable is set  
US1249: Wave: Added text "IQ" to wave file name to indicate the file is a pre-processed recording  
DE744: Wave: Fixed a bug that would corrupt WBIR and hang QR/P if MOX was disabled before the wave file finished playing  
DE751: Wave: Fixed a bug where Quick Playback turns on MON for AM, FM and SAM modes  
DE740: Fixed logic that would cause some TRX calibrations to fail on 60m on non-US SDRs

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## Firmware Update Information

### **PowerSDR v2.5.3 does not require updated firmware for the FLEX-5000, FLEX-3000 or FLEX-1500**

**OPERATIONAL NOTICE:** Starting with PowerSDR v2.4.4, a new 4.0 Firewire driver is utilized whose architecture is completely different from the previous 3.x driver family. There is also a 4.0 firmware dependency for the FLEX-5000 and FLEX-3000 which is NOT backwards compatible with previous versions of PowerSDR. Once you install PowerSDR v2.4.4 or greater you will not be able to run any versions of PowerSDR previous to PowerSDR 2.4.4 that utilized the older 3.x Firewire driver and firmware.

You can however revert back to the previous 3.0 driver. If you need to revert to a previous version of PowerSDR (less than v2.4.x), then follow the procedure #1 listed below in the [FLEX-5000 and FLEX-3000 Operation Notes](#) section of these release notes.

Beginning with PowerSDR v2.0.22, drivers and firmware specific for the model of SDR you are operating are automatically installed as part of the software installation & startup process. Do not attempt to manually install a hardware driver or firmware update unless specifically requested by FlexRadio Customer Support. Do **not** power off your radio or shut down PowerSDR if a firmware or device driver installation is being executed.

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## Database Import Recommendations and Cautions

**Do NOT import via the Setup from a database that was created from a different radio type. This is prohibited in PowerSDR v2.3.5 and greater. Using a database created with a different radio model than the one you are using can damage your radio will void your warranty!**

There are no significant database schema changes with PowerSDR v2.5.3 so importing a database from v2.4.4 should not pose any operational issues. You will have to uncheck the “Strict DB Import Compliance” option in Setup before importing a PowerSDR v2.4.4 database.

It may be possible to import selected database settings from previous database versions using the third-party K9DUR SDR Data Transfer Utility. Please verify PowerSDR version compatibility before using. For more information regarding the K9DUR SDR Data Transfer Utility and its compatibility with PowerSDR v2.5.3 please refer to the following KB article: <http://kc.flexradio.com/KnowledgebaseArticle50327.aspx>

If your experience *any* anomalous behavior with your radio after importing data from a database that was created from an earlier version of PowerSDR v2.5.3, **reset your database immediately** using the Factory Defaults feature in the Setup form **and do not re-import any data** or contact FlexRadio Systems support.

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## Known Issues or Recommendations with New Features Included in this Release

**Waterfall Low/High level Settings by Band:** The waterfall's low/high level settings per band are stored in the PowerSDR database. Importing a database from a version of PowerSDR previous to v2.5.3 will reset the waterfall's low/high levels to the default settings.

**FHM-1 TX Profiles.** FlexRadio Systems has introduced a new hand microphone, the FHM-1 for the FLEX-1500, FLEX-3000, FLEX-5000 and FLEX-6000 family of SDRs. On the back of the FHM-1 microphone there is a 2-position switch labeled Tone "1" and "2". Position 1 is the wide frequency response setting whereas position 2 is a narrower frequency response setting. The new FHM-1 TX profiles have been specifically tailored for the Tone 1 (wide frequency response) setting for best audio fidelity. Before using the FHM-1 microphone, check to make sure the TONE switch is in the "1" or left hand side position. You may choose to set the TONE switch to the "2" position for extra punch if operating conditions call for communication quality audio and more effective talk power.

**FLEX Firewire Driver 4.0.0:** The FLEX Firewire driver will be updated to version 4.0.0 with PowerSDR v2.5.3 if PowerSDR v2.4.4 or greater has not been previously installed or your FLEX-5000/FLEX-3000 had been reverted to PowerSDR v2.3.5 or earlier. There is no need to uninstall the previous Firewire driver version before installing version 4.0.0.

**Due to the significant changes in the driver architecture, once you update to PowerSDR v2.4.4 or greater with the new v4.0.0 Firewire driver, you will not be able to run previous versions of PowerSDR since the abstraction layer DLL is \*not\* backwards compatible with the previous v3.x version of the Firewire driver.**

Trying to run a version of PowerSDR less than 2.4.4 will result in errors when you start PowerSDR indicating that a firmware update is needed when the updated the firmware has already been installed by PowerSDR v2.5.3. Click **NO** to exit the initialization of PowerSDR.

**This caveat is only applicable to the Firewire based FLEX-5000 and FLEX-3000**

If you need to revert to a previous version of PowerSDR (less than v2.4.x), then follow the procedure #1 listed below in the [FLEX-5000 and FLEX-3000 Operation Notes](#) section of these release notes.

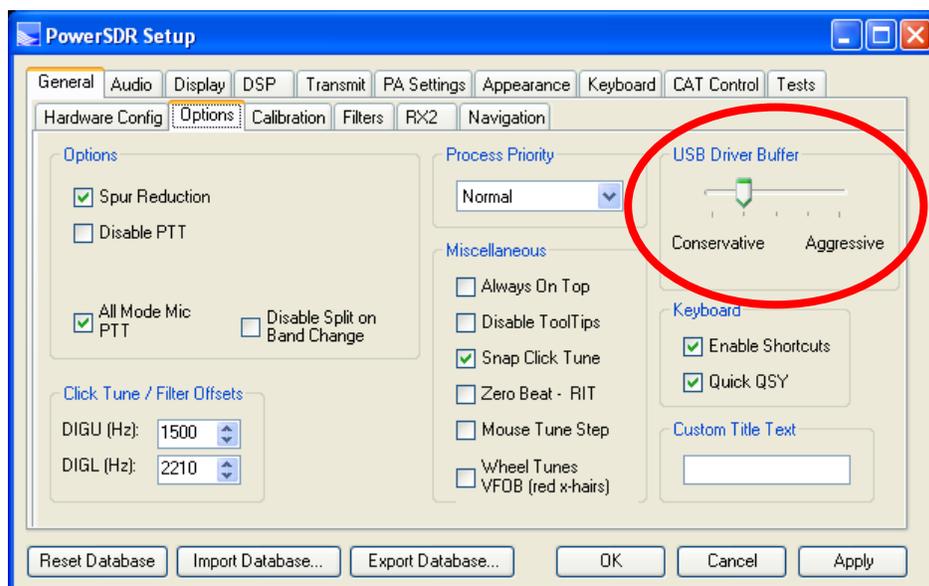
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## FLEX-5000 and FLEX-3000 Operation Notes

1. If you need to revert your FLEX-5000 or FLEX-3000 back to a version of PowerSDR less than v2.4.x which uses the 3.x version of the Firewire driver, follow the procedure below:
  - A. Shut down PowerSDR and power off your software defined radio.
  - B. If the FLEX Firewire control panel is open, close it.
  - C. Un-install PowerSDR v2.4.x (or greater) using either the Control Panel method or by using the uninstall PowerSDR option in the Start Menu (FlexRadio Systems->PowerSDR v2.4.x folder)
  - D. Using the Windows Control Panel, select the Remove Program applet.
  - E. Look for any instances of the FLEX Firewire driver. They will be listed as a variant of FlexRadio 3.x.x and or 4.x.x. Remove all instances of the FlexRadio Firewire driver.
  - F. Uninstall PowerSDR v2.3.5 using the Control Panel's Remove Program applet
  - G. Reboot your PC.
  - H. Download the applicable manual Firmware Installation program for your radio.  
**Do not run the manual firmware installer at this time**
    - a. FLEX-5000 Firmware: v1.3.0.8 <http://support.flexradio.com/Downloads.aspx?id=287>
    - b. FLEX-3000 Firmware: v1.2.5.6 <http://support.flexradio.com/Downloads.aspx?id=289>
  - I. Download PowerSDR v2.3.5 <http://support.flexradio.com/Downloads.aspx?id=393>
  - J. Run the PowerSDR 2.3.5 Installer setup program. This will install the v3.5.5 Firewire driver. Reboot your PC when prompted.
  - K. After the PC has completely booted up, power on the FLEX-x000 and allow the Firewire driver to complete its installation. For Vista and Win7 operating systems this is performed silently without any user intervention. For XP systems, the user will have to confirm three sub-driver installations.
  - L. **DO NOT START PowerSDR v2.3.5.** Run the manual FLEX-5000 or FLEX-3000 firmware installer downloaded in Step H. Wait for the relay click after the firmware loads. (you can power cycle the radio if you are unsure that the relay clicked)
  - M. Verify that the Firewire driver is properly installed by opening the FLEX Firewire Driver Control Panel. The FLEX-x000 should be a recognized device.
  - N. Start PowerSDR v2.3.5 and proceed with the initial setup wizard. You will be prompted to do a firmware update. Click OK to do the firmware update. Also you will be prompted if your radio is a FLEX-5000, if it is, acknowledge that prompt. If your radio is a FLEX-3000, click NO until you are prompted if your radio is a FLEX-3000, then acknowledge that prompt.
  - O. After the firmware install has completed, PowerSDR will be shut down. Restart PowerSDR v2.3.5
  - P. You should see the EEPROM data transfer dialog boxes indicating your radio is working properly. PowerSDR v2.3.5 will start normally. You may have to toggle the stop/standby button to get the audio stream to initialize the first time you start it.
2. You can run a FLEX-x000 SDR and a FLEX-1500 on the same PC at the same time. A radio "Chooser" will appear to allow you to select which radio you would like to operate. The software now keeps track of the database files for you. Just click "USE" next to the radio you want. If USE is grayed out, then check to make sure the radio is properly powered up.  
  
***NOTE: Currently you must start the FLEX-1500 FIRST for multiple radios to operate properly. Also, you can only have one (1) USB-based radio and one (1) Firewire based radio operating at one time.***
3. To prevent the possibility of a conflicted hardware state with the Firewire card and the FLEX-5000 or FLEX-3000 resulting in a system crash or hang, set your Windows Power Options for **High Performance** so the PC does not go to "sleep" or into hibernation mode while the SDR is connected and powered up.

## FLEX-1500 Operation Notes

1. Do not boot your computer with the FLEX-1500 powered up or the streaming USB drivers may not properly load. Use the following Power Up / Power Down sequence
  - a.) Power off or make sure the FLEX-1500 is powered off
  - b.) Boot the PC and allow Windows to completely initialize
  - c.) Power on the FLEX-1500 and wait several seconds for Windows to load the drivers
  - d.) Start PowerSDR
  - e.) Shut down PowerSDR and wait several seconds for the database to close.
  - f.) Power off the FLEX-1500
  - g.) Shut down Windows
2. Performance optimization: The FLEX-1500 utilizes a real time driver to communicate between PowerSDR and the radio via USB. There are two steps to optimize the streaming performance of the USB interface. This varies by PC. Just because you have the fastest processor out today does not automatically mean that your PC's USB controller will achieve maximum performance. We have created a control to match the USB driver buffer streaming to your specific hardware. There are two steps to this process.
  - a. USB Driver Buffer control: The USB Driver Buffer control allows optimization of the low level USB stream. This control is found on the Setup/General/Options form as seen below. *Note that PowerSDR must be in standby in order to change this control.* The default setting has been chosen to allow successful startup of PowerSDR on most machines but may not provide optimal performance on your specific PC. More aggressive settings reduce latency and improve keying performance in CW. More conservative settings will allow lower performing USB controllers and/or CPUs to function smoothly. Choose the most aggressive setting that provides stable operation without popping or distortion of the received signal.



- b. Audio Buffer Size: We recommend use of the smallest audio buffer setting on the Setup/Audio/Primary form that provides un-distorted audio and smooth CW keying. These will reduce latency to a minimum. The exact settings are dependent on your computer hardware but will usually be 512 or 256.
3. Using the FLEX-1500 on the same USB controller as low-speed devices, such as a mouse or keyboard will result in the FLEX-1500 be forced to a lower data transfer rate which will *significantly* affect the performance of the radio in regards to latency which is most evident when operating CW. Refer to this KB article regarding the use of USBDeview to determine if the FLEX-1500 is using the same USB controller as other USB devices (<http://kc.flexradio.com/KnowledgebaseArticle50459.aspx>)
4. The IF offset default is set to 9 kHz in this software release. This causes the centering of the received passband to be slightly off to the side. If you want better centering, you may check the "Expert" box in Setup/General/Hardware Config and set the IF in Hz to some value between 500 Hz and 4500 Hz for better centering.
5. The SPUR REDUCTION (SR) control is default "ON." The frequency span of the Panadapter screen will be wider with SR turned off. Since there are extremely few spurs visible on the FLEX-1500, the recommended normal use of SR is "OFF."
6. You can run a FLEX-x000 SDR and a FLEX-1500 on the same PC at the same time. A radio "Chooser" will appear to allow you to select which radio you would like to operate. The software now keeps track of the database files for you. Just click "USE" next to the radio you want. If USE is grayed out, then check to make sure the radio is properly powered up.

***NOTE: Currently you must start the FLEX-1500 FIRST for multiple radios to operate properly. Also, you can only have one (1) USB-based radio and one (1) Firewire based radio operating at one time.***

7. To prevent the possibility of a conflicted hardware state with the USB controller and the FLEX-1500 resulting in a system crash or hang, set your Windows Power Options for **High Performance** so the PC does not go to "sleep" or into hibernation mode while the SDR is connected and powered up.

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## SDR-1000 Operation Notes

1. The new CW keyer provided in PowerSDR versions starting with v2.0.22 require a microprocessor inside the radio to achieve the real time performance levels needed for break-in CW using attached paddles. The SDR-1000 does not incorporate such a microprocessor. Therefore, beginning with v2.0.22, attached paddles are no longer supported on the SDR-1000. From this point forward CW paddles are supported on the SDR-1000 only through the use of COM port keying. Please refer to the SDR-1000 Operating Manual pages 138-140 for setup and operation using this method.
2. To prevent the possibility of a conflicted hardware state with the parallel port/USBIO adapter and the SDR-1000 resulting in a system crash or hang, set your Windows Power Options for **High Performance** so the PC does not go to “sleep” or into hibernation mode while the SDR is connected and powered up.
3. If you plan to operate the SDR-1000 on a new PC or newly installed operating system with PowerSDR v2.x, it is recommended that you install PowerSDR v1.18.6 first and get your radio fully operational before installing any PowerSDR v2.x version.
4. The SDR-1000 is not supported running on any 64-bit versions of Windows. Windows XP is the recommended operating system for using the SDR-1000 due to possible third-party sound card driver incompatibilities.

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## How to Upgrade from PowerSDR 1.x to PowerSDR 2.x

### Prerequisites for FLEX-x000 Users Upgrading from PowerSDR 1.x to PowerSDR 2.x

**If you have previously installed and run any 2.x version of PowerSDR with your software defined radio, the following steps are NOT required.**

If you are upgrading to PowerSDR v2.5.3 from a 1.x version of PowerSDR, the following prerequisites are **REQUIRED** to ensure that your upgrade will be successful. The following software and firmware components must be installed before attempting the upgrade to PowerSDR v2.x for FLEX-5000 and FLEX-3000 users.

- PowerSDR v1.18.6
- Firewire Driver: v3.5.0.7171
- FLEX-5000 Firmware: 1.3.0.8
- FLEX-3000 Firmware: 1.2.5.6

### Upgrade to the Latest 1.x Version of PowerSDR.

Before upgrading to PowerSDR 2.x, you must install PowerSDR v1.18.6 following all of the default installation options.

You can download PowerSDR v1.18.6 from the FlexRadio Systems web site.

<http://support.flexradio.com/Downloads.aspx?id=322>

### Upgrade to Firewire Driver v3.5.0.7171

If you are not running version v3.5.0.7171 of the Firewire driver for PowerSDR v.18.6, you will need to upgrade your Firewire driver. This is to ensure that the firmware upgrade performed in the next step is successful. **Do not install this version of the Firewire driver if you have loaded PowerSDR v2.x**

You can download the Firewire v3.5.0.7171 driver from the FlexRadio Systems web site

<http://support.flexradio.com/Downloads.aspx?id=306>

### Upgrade your FLEX-x000 Firmware to the Latest 1.x Version

After you have confirmed that the Firewire driver is version 3.5.0.7171 or upgraded the Firewire driver to 3.5.0.7171 you must upgrade your radio's firmware to the latest 1.x version. You can download the firmware from the FlexRadio Systems web site.

- FLEX-5000 Firmware: 1.3.0.8 <http://support.flexradio.com/Downloads.aspx?id=287>
- FLEX-3000 Firmware: 1.2.5.6 <http://support.flexradio.com/Downloads.aspx?id=289>

Once you have brought up your FLEX-5000 and/or FLEX-3000 to the latest versions of 1.x firmware and software, follow the recommendations above in the [PowerSDR 2.x Software Installation/Upgrade Recommendations and Guidelines](#) section.



# PowerSDR™ v2.6.4 Release Notes

April 15, 2013

**IMPORTANT: Please read this document in its entirety before installing the new release of PowerSDR 2.x.**

PowerSDR v2.6.4 is an official release version intended for use with the FLEX-1500™, FLEX-3000™ and FLEX-5000™ software defined radio transceivers.

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## PowerSDR 2.6.4 Installation Information

### PowerSDR 2.x Software Installation/Upgrade Recommendations and Guidelines

Please read all of the following guidelines and follow the recommendations to ensure a trouble free upgrade of your software defined radio to PowerSDR v2.6.4.

The instructions below are applicable for users that already have *a previous version of PowerSDR v2.x* installed on their PC. **If you have the older PowerSDR v1.x currently installed, please see the Prerequisites for FLEX-x000 Users Upgrading from PowerSDR 1.x to PowerSDR 2.x in the section below.**

1. Minimum required CPU for PowerSDR v2.6.4 and greater is an Intel Pentium IV and an AMD Athlon 64 / Operon and greater. Lesser processors do not have the necessary SSE2 capability needed for the DSP engine.
2. The minimum version of Windows supported by PowerSDR v2.6.4 and above is Windows XP Service Pack 3 (SP3). If your Windows XP PC has not been upgraded to SP3, you must do so before installing PowerSDR v2.x. See Minimum Windows and .NET Requirements below for obtaining Win XP SP3.
3. It is **not necessary or recommended** to uninstall any previous versions of PowerSDR 2.x before installing PowerSDR v2.6.4. In fact, it is not recommended that you uninstall previous versions of PowerSDR unless you uninstall **all** previous versions so that files and drivers installed as dependencies with previous versions are all properly removed before installing PowerSDR v2.6.4
4. It is **not necessary or recommended** to manually remove the Firewire driver before installing PowerSDR v2.6.4. Doing so after PowerSDR v2.6.4 is installed will make your FLEX-5000 / FLEX-3000 inoperable. Do not install any standalone versions of the Firewire driver either.
5. The PowerSDR v2.x installer requires administrator level rights to install the kernel mode device drivers for the various SDR radios. The Installer should automatically elevate to this level of rights when run regardless of the current user rights, but if you are in doubt that your login has full administrator rights or you are getting errors indicating files cannot be found, you need to right click on the PowerSDR v2.x Integrated Installer icon and select the "Run As..." option and run the Installer with the administrator account, and not your login account ID.
6. The PowerSDR v2.x Installer no longer prompts the user for radio options. All drivers are now pre-loaded to eliminate the need to re-install a version of PowerSDR in order to load a needed device driver.
7. Firmware updates, if needed, are applied automatically when running the new version of PowerSDR for the first time. Do **not** stop the firmware installation until it has fully completed or your radio may not operate properly thereafter.
8. See additional operation notes regarding your specific model radio later in this document.
9. If you are installing a FlexControl with PowerSDR v2.6.4 **for the first time**, please read the *FlexControl Installation Errata Sheet* shipped with the FlexControl regarding use with Virtual Serial Port software prior to installation. You may need to remove any existing virtual com port pairs you have defined before installing PowerSDR and the FlexControl drivers. This is not necessary if you have an existing operational FlexControl connected to your PC.

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## Minimum Windows and .NET Requirements

PowerSDR 2.x is a Windows 32-bit .NET application designed to operate on Windows XP SP3, Vista, Windows 7 and Windows 8. The .NET 3.5 SP1 Framework is required. PowerSDR v2.x will run on 32 or 64-bit operating systems.

As of July 13, 2010, Windows XP SP2 (service pack 2) is no longer supported or actively updated by Microsoft, therefore if your PC is running Windows XP SP2, you must install Service Pack 3 (SP3) before installing PowerSDR v2.6.4. The PowerSDR 2.x Integrated Installer will check for this dependency and inform you if your PC does not meet the minimum XP Service Pack requirements.

For more information regarding upgrading your PC to Windows XP SP3, refer to [Learn how to install Windows XP Service Pack 3 \(SP3\)](http://windows.microsoft.com/en-US/windows/help/learn-how-to-install-windows-xp-service-pack-3-sp3) (<http://windows.microsoft.com/en-US/windows/help/learn-how-to-install-windows-xp-service-pack-3-sp3>) on the Microsoft web site.

If you need to install the .NET 3.5 SP1 Framework, the PowerSDR 2.x Integrated Installer will either install .NET 3.5 SP1 from the installation CD or try and download the necessary software from the Internet. Alternately, you can download it directly from Microsoft using this web link before running the PowerSDR Integrated Installer: <http://www.microsoft.com/en-us/download/details.aspx?id=25150>

## Obtaining Technical Support

If you encounter issues installing or operating PowerSDR v2.6.4 with FlexRadio's software defined radios, please contact FlexRadio Systems technical support by opening a HelpDesk support ticket on-line at <http://helpdesk.flexradio.com> or by phone at +1 (512) 535-4713 extension #2. Please leave a voice mail message if you don't get an answer as all of our engineers are probably busy on existing calls.

**Hours of Operation.** Our Technical Support engineers are available Monday – Friday from 8:00am-5:30pm Central Time. If you call after business hours, on a holiday or weekend, please leave a detailed message and we will return your call in the order it was received during regular business hours.

You may always submit a HelpDesk support ticket at any time.

If you need assistance opening a HelpDesk ticket, please refer to the following web page for detailed instructions. <http://support.flexradio.com/>

## New Features and Improvements for PowerSDR v2.6.4

*NOTE: A detailed changelog.txt file can be found in the Documentation folder under the FlexRadio Systems Windows Start menu for PowerSDR v2.6.4*

### New Features

1. **Updated Firewire driver.** This release of PowerSDR contains an updated Firewire driver version 4.1.1.17085. It contains multiple bug fixes and some performance improvements over the previous 4.0.0 driver. The updated 4.1.1 Firewire driver is **not** backwards compatible with previous versions of PowerSDR that used the 4.x version of the Firewire driver, which is PowerSDR 2.4.4 and greater.

However there is a manual workaround that will allow the new 4.1.1 Firewire driver to work with previous versions of PowerSDR that used the 4.0.0 Firewire driver. Please see the *FLEX Firewire Driver 4.1.1* reference in the [Known Issues or Recommendations with New Features Included in this Release](#) section below for more details.

2. **New UK 60m Band Segments.** Earlier in 2013, the 60m channelized band for the UK was refactored into eleven (11) individual band *segments* of various bandwidths where all emission modes are allowed. This version of PowerSDR fully supports the new 60m band segments for FLEX Series SDRs that have *already* been modified by an authorized UK FlexRadio Systems distributor/representative for operating on the UK 60m band. For operators in the UK that have not had their radios modified by a FlexRadio Systems distributor, you must present your NOV to your distributor and request that your radio be modified (TURFed) for UK\_Plus operation or contact the FlexRadio EU Representative ([klaus@flexradio.com](mailto:klaus@flexradio.com)).
3. **New 60m Band Segment Allocation for Sweden.** PowerSDR v2.6.4 has been enhanced to provide regulatory compliance for operators who operate in Sweden in addition to allowing transmit on the four (4) 60m band segments. In order for Swedish operators to use the new frequency allocation, your radio will need a TURF update to designate it as a Swedish radio. Please contact the FlexRadio EU Representative ([klaus@flexradio.com](mailto:klaus@flexradio.com)) for details on updating your radio hardware.
4. **Transmit Frequency Changes for France, Italy and Russia.** For radios that have been modified (TURFed) for operation in France, Italy and Russia, minor changes have been made several band allocations. For France, the 6m band has been expanded. For Italy, the 160 and 6m bands have been expanded. For Russia, the 10m and 11m bands have been modified. *It is not necessary to have these radios re-TURFed in order for these changes to take effect.*
5. **CHU Added to WWV Bandstack.** The three (3) CHU stations have been added to the Time and Frequency Reference Band (WWV) bandstack registers.
6. **Convenient Frequency Selection for Frequency Calibration Routine.** A new feature has been added to capture the VFO-A frequency for use with the Setup Frequency Calibration routine for greater convenience when evaluating several different frequency reference transmission frequencies by using the WWV band select feature.
7. **New Extended PowerSDR CAT commands.** Two (2) new extended CAT commands for PowerSDR, ZZFR and ZZFS have been added for setting RX2 VAR filters.

8. **New PowerSDR Uninstall Option.** The PowerSDR v2.6.4 Installer has a new feature included with the PowerSDR v2.x uninstall process. When using the Uninstaller, the user is provided the option to do a complete “clean up” of the PowerSDR version that is being uninstalled, which includes removing all files that PowerSDR v2.x created as a part of its normal operation, like the DttSP wisdom file and all databases. These files historically have not been removed as part of the PowerSDR uninstall process. By selecting this option, you are completely “cleaning” the PowerSDR v2.x application from your computer. You should select this option if you want to do a clean re-install of PowerSDR v2.x.
9. **Maximum CAT Baud Rate increased.** The maximum baud rate for the CAT serial port has been increased from 57.8k to 115.2k.
10. **Additional Database Error Trapping.** If an XML database fails to properly write to disk, an informative error message now alerts the user of the error condition. Databases are written to disk when PowerSDR I closed down and write errors can result in database integrity issues.
11. **Display Centering for the FLEX-1500.** When operating with a new database or after a database reset, the VFO frequency indicator and RX passband are now centered in the panadapter allowing for equal amounts of viewable spectrum above and below the VFO frequency indicator line.

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## Enhancements and Bug Fixes Incorporated in Release v2.6.4

Below is a listing of program changes, enhancements and defects corrected in this release of PowerSDR.

US1590	Support for Legacy SDRs using sound cards has been removed
US1742	Upgraded Firewire driver to version 4.1.1.17085
US1292	Added new 60m band segments for radios TURFed for UK_Plus
US1632	60m band allocation added for Sweden – Requires a radio TURF before using
US1628	Modified 160 and 6m bands for radios TURFed for Italy
US1630	Modified 11 and 10m bands for radios TURFed for Russia
US1693	Modified 6m band for radios TURFed for France
US1674	1500: RX passband is now centered in the middle of the Panadapter with default DB
DE786	1500: Removed Slew Rate option which resulted in high RX noise floor after use
DE770	1500: Fixed PTT via FlexWire in Expert Mode not persistent between band changes
US1705	3000: XML data file write error trapping logic added for ATU database
DE940	DB: BandText harmonization failed if DB was initializing and firmware updated needed
DE784	DB: Incomplete DBs are no longer permitted to be exported
US1703	DB: XML data file write error trapping logic added for main database
US1705	DB: XML data file write error trapping logic added for Master database
DE849	CAT: Fixed a boundary condition that resulted in an UHE when executing ZZRU and ZZRD
US1454	CAT: Increased the maximum input frequency change for ZZRF and ZZXF
US1295	CAT: ZZFR and ZZFS added for setting RX2 VAR filters
US1636	CAT: Increased the maximum CAT port baud rate to 115.2k
DE766	Console: Fixed a TX filter bug when changing modes if disable split on mode change is enabled
DE768	Console: Fixed frequency label formatting errors on Panadapter and waterfall displays
US1296	Console: CHU frequencies now added to WWV bandstack
US1456	Console: XIT enabled for 60m if band is not channelized
US1455	Console: VOX is turned off when Power button turned on and off prevent unintentional TX
US1683	Console: Screen position for Filter Edit form is remembered after closing
US1675	Console: Default startup mode is SAM to match default startup frequency (WWV)
DE767	FlexControl: Fixed a condition that resulted in both VFOs being tuned at the same time
DE771	FlexControl: Fixed a condition that resulted in double tune steps while tuning
US1627	Panadapter: Added a visual 60m UK and Sweden band segment indicator
US1678	Installer: Option added to uninstall process to remove databases for “clean” uninstall
DE1043	Memories: Fixed a bug that resulted in an incorrect VFO-A readout if memory had split enabled
DE785	Profiles: Fixed inconsistent behavior with VAC Auto On option
US1677	Profiles: Added FLEX-1500 Blanking time and Mic Boost to Transmit Profiles
DE990	RX2: Incorrect filter enable function called when switching from AM and DRM mode
US1588	Setup: Added a feature to capture the current VFO-A frequency for Frequency Calibration test
US1708	Added Feature to modify color and line width for the UK/Sweden 60m band segment indicator
US1676	VAC: Spur Reduction is automatically turned off when VAC with DirectIQ is enabled
DE780	WAVE: Fixed a condition where the wrong folder might be opened for selecting WAV files
DE769	WAVE: Fixed a defect where recording sampling rates higher than the radio could be selected
DE1036	Fixed a bug that could result in the FFT spectrum not initializing after a sampling rate change

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## Firmware Update Information

### **PowerSDR v2.6.4 requires updated firmware for the FLEX-5000, FLEX-3000 and FLEX-1500**

New firmware required and will be automatically installed when running PowerSDR v2.6.4 for the first time. No manual user intervention is required.

Beginning with PowerSDR v2.0.22, drivers and firmware specific for the model of SDR you are operating are automatically installed as part of the software installation & startup process. Do not attempt to manually install a hardware driver or firmware update unless specifically requested by FlexRadio Customer Support. Do **not** power off your radio or shut down PowerSDR if a firmware or device driver installation is being executed.

**OPERATIONAL NOTICE:** Starting with PowerSDR v2.4.4, a new 4.x Firewire driver is utilized whose architecture is completely different from the previous 3.x driver family. There is also a 4.x firmware dependency for the FLEX-5000 and FLEX-3000 which is NOT backwards compatible with previous versions of PowerSDR. Once you install PowerSDR v2.4.4 or greater you will not be able to run any versions of PowerSDR previous to PowerSDR 2.4.4 which utilized the older 3.x Firewire driver and firmware.

You can however revert back to the previous 3.x Firewire driver. If you need to revert to a previous version of PowerSDR (less than v2.4.4), then follow the procedure #1 listed below in the [FLEX-5000 and FLEX-3000 Operation Notes](#) section of these release notes.

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## Database Import Recommendations and Cautions

**Do NOT import via the Setup screen a database that was created from a different radio type. This is prohibited in PowerSDR v2.3.5 and greater. Using a database created with a different radio model than the one you are using can damage your radio will void your warranty!**

**There is a significant database schema changes with PowerSDR v2.6.4 so importing a database from a previous version of PowerSDR using the Setup Import feature will result in errors.**

It is highly recommended to import selected database settings from previous database versions using the third-party **K9DUR SDR Data Transfer Utility**. The K9DUR SDR Data Transfer utility accommodates variations and changes in the database schema between PowerSDR versions that are not accounted for when using the normal database Setup based export (backup) and import (recovery) processes. Please verify PowerSDR version compatibility with the K9DUR SDR Data Transfer utility before using. For more information regarding the K9DUR SDR Data Transfer Utility and its compatibility with PowerSDR v2.6.4 please refer to the following KB article: <http://kc.flexradio.com/KnowledgebaseArticle50327.aspx>

However, for 60m UK and Swedish operators, importing bandstack data from a previous version of PowerSDR Using the Import utility in the Setup form will result in incorrect bandstack registers and VFO alpha tag displays when using 60m. And importing a database into PowerSDR v2.6.4 will overwrite the new CHU bandstack entries for all users.

If your experience *any* anomalous behavior with your radio after importing data from a database that was created from an earlier version of PowerSDR v2.6.4, **reset your database immediately** using the Factory Defaults feature in the Setup form **and do not re-import any data** or contact FlexRadio Systems support.

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## Known Issues or Recommendations with New Features Included in this Release

**FLEX Firewire Driver 4.1.1:** The FLEX Firewire driver will be updated to version 4.1.1.17085 with PowerSDR v2.6.4. This new driver has several bug fixes and performance enhancements over the previous 4.0.0 Firewire driver.

Make sure that you power on your FLEX-5000 and/or FLEX-3000 and allow it to complete the Firewire driver installation after your PC has rebooted and **BEFORE** you start PowerSDR v2.6.4. **For Windows XP systems, make sure you install all three (3) driver components when prompted.** For Windows Vista and greater, the Firewire driver installs automatically without user intervention; just wait for the message that your new hardware is ready to use.

**The following caveats are only applicable to the Firewire based FLEX-5000 and FLEX-3000.** After installing PowerSDR v2.6.4 which automatically installs the updated FLEX Firewire driver 4.1.1.17085, you will not be able to run any previous version of PowerSDR previous to v2.6.4 because one of the driver components is not backwards compatible with the 4.0.0 Firewire driver. This condition is indicated by a message requesting a firmware update when PowerSDR is started, but PowerSDR cannot properly identify your FLEX-5000 or FLEX-3000, as it asks you what type of radio you are using. Click **NO** to exit the initialization of PowerSDR v2.6.4. There is however a workaround to make previous versions of PowerSDR that used the 4.0.0 Firewire driver operational. Manually copy the **pal.dll** file from the PowerSDR v2.6.4 application folder to the PowerSDR v2.4.4 or PowerSDR v2.5.3 application folders. This will allow you to run those two versions of PowerSDR with the new 4.1.1.17085 Firewire driver.

**Running versions of PowerSDR previous to PowerSDR v2.4.4:** Due to the significant changes in the 4.x Firewire driver architecture, once you update to PowerSDR v2.4.4 or greater with the new 4.x Firewire driver, **you will not be able to run PowerSDR v2.3.5 or any other earlier versions** since the abstraction layer DLL and firmware are **\*not\*** backwards compatible with the previous v3.x version of the Firewire driver.

Trying to run a version of PowerSDR 2.3.5 or earlier with the 4.x version of the Firewire driver will result in errors when you start PowerSDR indicating that a firmware update is needed when the updated the firmware has already been installed by PowerSDR v2.6.4. Click **NO** to exit the initialization of PowerSDR and run a version of PowerSDR v2.4.4 or greater.

If you need to revert to a previous version of PowerSDR (less than v2.4.4), then follow the procedure #1 listed below in the [FLEX-5000 and FLEX-3000 Operation Notes](#) section of these release notes.

**New 60m Band Segments for UK:** On 1-Jan-2013, [OFCOM issued a Notice of Variation Change](#) that refactored the previous channelized 60m band into 11 band segments or blocks allowing any emission mode that does not exceed the bandwidth of the frequency segment. Previously in PowerSDR the 60m band was “channelized” which restricted the mode of operation to USB and only allowed narrow mode transmissions in the center of the channel. With the new change to the UK 60m band, PowerSDR is no longer channelizing the 60m band for the UK, therefore the previous spectrum shading used to indicate a channelized portion of the band is no longer applicable. Refer to the Band text (alpha tags) under the VFO to designate the different band segments numbered 1 through 11.

The UK and Swedish 60m band segments are now visually indicated by a colored rectangular box on the Panadapter. The color and line width of the band segment indicator box can be modified by the user in the Setup->Appearance->Display tab.

**New 60m Band Segments for Sweden:** As noted previously, in order to use the new 60m Band allocations for Sweden, your radio must have the EEPROM modified for the Swedish transmit region (TURF). Please contact the FlexRadio EU Representative ([klaus@flexradio.com](mailto:klaus@flexradio.com)) for details on updating your radio hardware.

**VOX Turned Off on PowerSDR Power on:** VOX is now turned off when the PowerSDR Start/Standby button is off or turned off to prevent unintended transmissions (QRM) when turned on. It can be turned back on after the Start/Standby button is turned on.

**Support for Legacy SDRs:** Support for all sound card based legacy SDRs has been concluded beginning with PowerSDR v2.6.4. Refer to the section [SDR-1000 Software Support Notice](#) below for additional information.

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## Troubleshooting FLEX-5000 and FLEX-3000 Connectivity Issues

With the new FLEX 4.x Firewire driver, its improved streaming performance can expose weaknesses and deficiencies in your PC configuration that may result in your FLEX-5000 or FLEX-3000 not being able to properly communicate with the computer after upgrading. It may not connect at all, stop working after a few minutes or freeze when changing sampling rates or buffers. There can be several reasons for these failures, such as Firewire cards that are not fully supported by the new Firewire device driver, Windows OHCI 1394 driver incompatibilities with certain Firewire cards or PCIe bus timing problems. Additionally, PCs that worked perfectly well with the older 3.x interrupt driven Firewire driver may now fail to work properly because the new streaming 4.x Firewire driver, which fully utilizes the 1394 Firewire interface's capabilities, has exposed these existing deficiencies that previously did not result in operational issues.

There are several factors that come into play for proper Firewire communication between the PC and the radio hardware, such as utilizing a compatible Firewire card, operating system version and PC motherboards. These different inter-dependent variables present a unique challenge for troubleshooting the primary cause of the Firewire communication failure.

If you experience these problems, your best course of action is to submit a support [HelpDesk](#) ticket so one of our Technical Support Engineers can systematically triage your connectivity problem. Our support engineers have the experience and expertise to quickly analyze and in some cases resolve the problem with a simple system configuration change. However, if you would like to troubleshoot the problem yourself, below are a few troubleshooting steps that you can try on your own.

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### Checking the Compatibility of your Firewire Card

There is a utility in the FLEX Firewire control panel that allows you to verify that your OHCI Controller (Firewire card) is compatible with the FLEX 4.0 Firewire driver.

Please refer to the HelpDesk article [Verifying Firewire Card Compatibility with the FLEX Firewire Driver](#) for a step-by-step procedure for verifying Firewire Card compatibility.

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### VIA Firewire cards and Windows 7

We have determined that Firewire cards using the VIA chipset and some others that are running on Windows 7 have a higher probability of Firewire related connectivity issues when using the default Windows 1394 bus driver. If you are using a VIA Firewire card, please check that your Windows 1394 bus driver is using the "Legacy" version if you are experiencing connectivity issues. This change may also benefit other Firewire cards that are experiencing connectivity problems running on Windows 7.

If you have checked the compatibility of your Firewire card using the procedure above and it has a VIA chipset, then refer to the HelpDesk article [Setting the Win7 1394 Bus Driver to the Legacy Version](#) for a step-by-step procedure for changing your Windows 7 OHCI Compliant Host Controller driver to the legacy version.

Note that after a Windows update, the Windows 7 OHCI Compliant Host Controller driver may be changed from legacy version back to the native driver, resulting in your radio having connectivity issues after previously running properly. If your PC stops working mysteriously, re-check to make sure your PC is still configured to the legacy Windows 7 OHCI Compliant Host Controller driver.

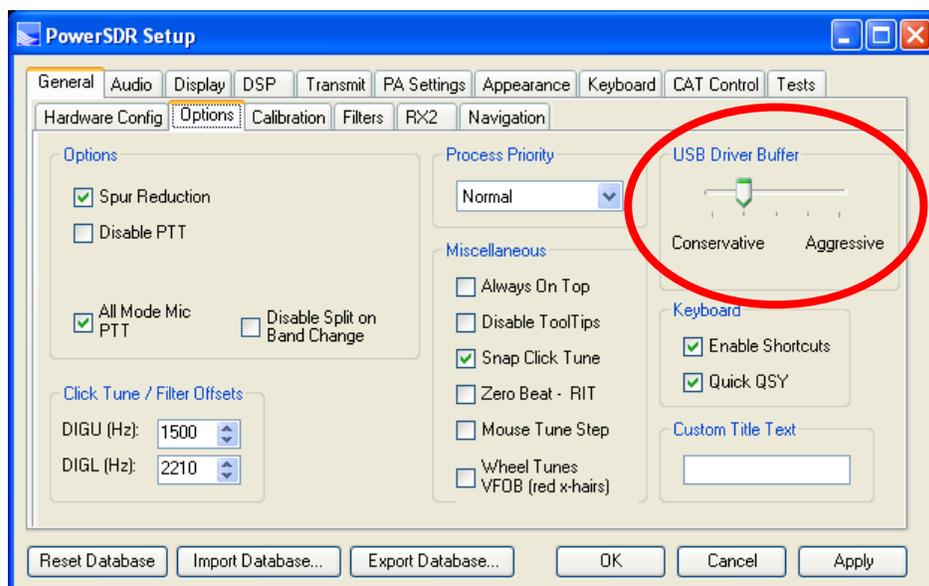
## FLEX-5000 and FLEX-3000 Operation Notes

1. If you need to revert your FLEX-5000 or FLEX-3000 back to a version of PowerSDR less than v2.4.4 which uses the 3.x version of the Firewire driver, follow the procedure below:
  - A. Shut down PowerSDR and power off your software defined radio.
  - B. If the FLEX Firewire control panel is open, close it.
  - C. Un-install PowerSDR v2.4.x (or greater) using either the Control Panel method or by using the uninstall PowerSDR option in the Start Menu (FlexRadio Systems->PowerSDR application folder)
  - D. Using the Windows Control Panel, select the Remove Program applet.
  - E. Look for any instances of the FLEX Firewire driver. They will be listed as a variant of FlexRadio 3.x.x and or 4.x.x. Remove all instances of the FlexRadio Firewire driver.
  - F. If installed, uninstall PowerSDR v2.3.5 using the Control Panel's Remove Program applet
  - G. Reboot your PC.
  - H. Download the applicable manual Firmware Installation program for your radio.  
**Do not run the manual firmware installer at this time**
    - a. FLEX-5000 Firmware: v1.3.0.8 <http://support.flexradio.com/Downloads.aspx?id=287>
    - b. FLEX-3000 Firmware: v1.2.5.6 <http://support.flexradio.com/Downloads.aspx?id=289>
  - I. Download PowerSDR v2.3.5 <http://support.flexradio.com/Downloads.aspx?id=393>
  - J. Run the PowerSDR 2.3.5 Installer setup program. This will install the v3.5.5 Firewire driver. Reboot your PC when prompted.
  - K. After the PC has completely booted up, power on the FLEX-x000 and allow the Firewire driver to complete its installation. For Vista and Win7 operating systems this is performed silently without any user intervention. For XP systems, the user will have to confirm three sub-driver installations.
  - L. **DO NOT START PowerSDR v2.3.5.** Run the manual FLEX-5000 or FLEX-3000 firmware installer downloaded in Step H. Wait for the relay click after the firmware loads. (you can power cycle the radio if you are unsure that the relay clicked)
  - M. Verify that the Firewire driver is properly installed by opening the FLEX Firewire Driver Control Panel. The FLEX-x000 should be a recognized device.
  - N. Start PowerSDR v2.3.5 and proceed with the initial setup wizard. You will be prompted to do a firmware update. Click OK to do the firmware update. Also you will be prompted if your radio is a FLEX-5000, if it is, acknowledge that prompt. If your radio is a FLEX-3000, click NO until you are prompted if your radio is a FLEX-3000, then acknowledge that prompt.
  - O. After the firmware install has completed, PowerSDR will be shut down. Restart PowerSDR v2.3.5
  - P. You should see the EEPROM data transfer dialog boxes indicating your radio is working properly. PowerSDR v2.3.5 will start normally. You may have to toggle the stop/standby button to get the audio stream to initialize the first time you start it.
2. You can run a FLEX-x000 SDR and a FLEX-1500 on the same PC at the same time. A radio "Chooser" will appear to allow you to select which radio you would like to operate. The software now keeps track of the database files for you. Just click "USE" next to the radio you want. If USE is grayed out, then check to make sure the radio is properly powered up.

***NOTE: Currently you must start the FLEX-1500 FIRST for multiple radios to operate properly. Also, you can only have one (1) USB-based radio and one (1) Firewire based radio operating at one time.***
3. To prevent the possibility of a conflicted hardware state with the Firewire card and the FLEX-5000 or FLEX-3000 resulting in a system crash or hang, set your Windows Power Options for **High Performance** so the PC does not go to "sleep" or into hibernation mode while the SDR is connected and powered up.

## FLEX-1500 Operation Notes

1. Do not boot your computer with the FLEX-1500 powered up or the streaming USB drivers may not properly load. Use the following Power Up / Power Down sequence:
  - a.) Power off or make sure the FLEX-1500 is powered off
  - b.) Boot the PC and allow Windows to completely initialize
  - c.) Power on the FLEX-1500 and wait several seconds for Windows to load the drivers
  - d.) Start PowerSDR
  - e.) Shut down PowerSDR and wait several seconds for the database to close.
  - f.) Power off the FLEX-1500
  - g.) Shut down Windows
2. Performance optimization: The FLEX-1500 utilizes a real time driver to communicate between PowerSDR and the radio via USB. There are two steps to optimize the streaming performance of the USB interface. This varies by PC. Just because you have the fastest processor out today does not automatically mean that your PC's USB controller will achieve maximum performance. We have created a control to match the USB driver buffer streaming to your specific hardware. There are two steps to this process.
  - a. USB Driver Buffer control: The USB Driver Buffer control allows optimization of the low level USB stream. This control is found on the Setup/General/Options form as seen below. *Note that PowerSDR must be in standby in order to change this control.* The default setting has been chosen to allow successful startup of PowerSDR on most machines but may not provide optimal performance on your specific PC. More aggressive settings reduce latency and improve keying performance in CW. More conservative settings will allow lower performing USB controllers and/or CPUs to function smoothly. Choose the most aggressive setting that provides stable operation without popping or distortion of the received signal.



- b. Audio Buffer Size: We recommend use of the smallest audio buffer setting on the Setup/Audio/Primary form that provides un-distorted audio and smooth CW keying. These will reduce latency to a minimum. The exact settings are dependent on your computer hardware but will usually be 512 or 256.
3. Using the FLEX-1500 on the same USB controller as low-speed devices, such as a mouse or keyboard will result in the FLEX-1500 be forced to a lower data transfer rate which will *significantly* affect the performance of the radio in regards to latency which is most evident when operating CW. Refer to this KB article regarding the use of USBDeview to determine if the FLEX-1500 is using the same USB controller as other USB devices (<http://kc.flexradio.com/KnowledgebaseArticle50459.aspx>)
4. You can run a FLEX-x000 SDR and a FLEX-1500 on the same PC at the same time. A radio “Chooser” will appear to allow you to select which radio you would like to operate. The software now keeps track of the database files for you. Just click “USE” next to the radio you want. If USE is grayed out, then check to make sure the radio is properly powered up.

***NOTE: Currently you must start the FLEX-1500 FIRST for multiple radios to operate properly. Also, you can only have one (1) USB-based radio and one (1) Firewire based radio operating at one time.***

5. To prevent the possibility of a conflicted hardware state with the USB controller and the FLEX-1500 resulting in a system crash or hang, set your Windows Power Options for **High Performance** so the PC does not go to “sleep” or into hibernation mode while the SDR is connected and powered up.

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## SDR-1000 Software Support Notice

Starting with PowerSDR v2.6.x, FlexRadio Systems formally announces the "End of Software Support" for the SDR-1000 transceiver. Repair services and technical support for the SDR-1000 transceiver will continue under the following conditions until further notice:

1. FlexRadio will continue to provide repairs on the SDR-1000 as long as components and subsystems are available. Please submit a HelpDesk support request for an RMA before sending in your SDR-1000 for repair.
2. While many SDR-1000 users enjoy some of the features of PowerSDR v2.x, the last RECOMMENDED stable version of PowerSDR for the SDR-1000 is v1.18.6. It is available at <http://support.flexradio.com/Downloads.aspx?id=322>
3. Customer support for the SDR-1000 will continue to be available via the [FlexRadio HelpDesk](#). TELEPHONE SUPPORT FOR THE SDR-1000 WILL NO LONGER BE PROVIDED.
4. A full set of documentation for the SDR-1000 can be found on the Knowledge Center at: <http://kc.flexradio.com/KnowledgebaseCategory50.aspx>
5. For user supported software fixes and enhancements, versions of PowerSDR that support the SDR-1000, which are licensed under the GNU Public License (GPL), are available for continued development by sending a request for source code to [gpl@flexradio.com](mailto:gpl@flexradio.com).

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# PowerSDR™ v2.7.2 Release Notes

December 16, 2013

**IMPORTANT: Please read this document in its entirety before installing the new release of PowerSDR 2.x.**

PowerSDR v2.7.2 is a general release version intended for use with the FLEX-1500™, FLEX-3000™ and FLEX-5000™ software defined radio transceivers.

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## New Features and Improvements for PowerSDR v2.7.2

*NOTE: A detailed changelog.txt file can be found in the Documentation folder under the FlexRadio Systems Windows Start menu for PowerSDR v2.7.2*

### New Features

1. **PowerSDR-DataTransfer™ now included with PowerSDR v2.x:** FlexRadio Systems is proud to announce a development partnership with RNA Consulting Services, LLC to provide a FlexRadio specific version of their well respected SDRDataTransfer program called **PowerSDR-DataTransfer™**. PowerSDR-DataTransfer facilitates the migration of database or configuration information from a previous to newer version of PowerSDR. One of the advantages of PowerSDR-DataTransfer is that it automatically takes care of any database changes that may be incompatible from one version of PowerSDR to another. A new feature of PowerSDR-DataTransfer is the Standard Mode of operation, where PowerSDR-DataTransfer searches your hard drive for any existing PowerSDR databases located in the default location and presents them in a “tree” structure, allowing for easy selection of the source and destination databases. After you select your source and destination databases, a single mouse click on the Transfer Data button is all that is needed to update your new version of PowerSDR with configuration settings from your previous version of PowerSDR.

If you have any questions about the operation of PowerSDR-DataTransfer, you can submit a support ticket via the FlexRadio Systems HelpDesk (<http://helpdesk.flexradio.com/home>) at any time for assistance.

2. **Updated Firewire Driver:** This version of PowerSDR contains an updated Firewire driver for the FLEX-5000 and FLEX-3000 software defined radios. This new Firewire driver contains some bug fixes and a few performance enhancements for Windows 7 and above. In addition to the improvements and bug fixes, this driver has been tested with and is recommended for the recently released Windows 8.1.

Before installing PowerSDR v2.7.2, make sure that your radio is turned off. If the FlexRadio Firewire control panel is opened, please close it before proceeding with the installation of PowerSDR v2.7.2. This will ensure that the new Firewire driver is properly installed.

3. **Enhanced Waterfall Display:** Enhancements have been made to the waterfall display to provide a high resolution representation of the sampled RF spectrum allows for viewing of signals with better granularity. **By turning display averaging off**, viewing fine detail of the RF spectrum in the time domain is now possible eliminating the smearing of spectrum. Additionally, when display averaging is enabled, the default display averaging settings have been modified to display greater spectrum detail along with the ability to easily identify weak signals in the noise. A new checkbox option in the Waterfall section of the Setup->Display tab, “Enable Weak Signal Display Optimization” will adjust the waterfall averaging time and update period to provide the ability to see even the weakest signals at the noise floor.

4. **New Transmit Compliance for Japan:** PowerSDR v2.7.2 has added transmit frequency compliance (TURF) for Japan. This change allows for CW (A1A) operation on the 4.63 MHz Japan National Emergency frequency as well as restricting 60m operation. To enable this feature after installing PowerSDR v2.7.2, you must modify your radio's firmware (TURF) for the Japan Region. To request this firmware modification, please submit a support type HelpDesk ticket requesting the TURF upgrade. In addition to the new transmit frequency modifications, a modified Band Plan for Japan will be created, displayed under the VFO displays.
5. **New IARU Region 3 Transmit Compliance:** In addition to the new transmit compliance for Japan; there is a new TURF option and band plan for any IARU Region 3 entity. As with the Japanese transmit compliance modification, to enable the IARU Region 3 feature, your radio's firmware will need to be modified by requesting the TRUF update via the FlexRadio Systems HelpDesk.
6. **Enhanced Database Protection.** With past versions of PowerSDR, if Windows or the user initiated a "forced" shutdown of Windows with PowerSDR still running, the database was not given enough time to be completely written to disk before the PC shut down resulting in an inconsistent database. Based on the nature of the inconsistency, the automatic database recovery process may not detect a problem and use a recovery database. The primary cause of forced shutdowns can be contributed to the automated Microsoft update process. PowerSDR v2.7.2 now properly intercepts the forced shutdown condition and properly closes PowerSDR ensuring that the database is properly written to disk before Windows reboots the computer.
7. **TX Profiles by Mode Option.** There is a new user selectable option that will remember the selected TX Profile by mode. When enabled (it is off by default), the TX Profile selection used for a particular mode is saved and recalled when that mode is selected again. The TX Profile Mode combination is maintained in the PowerSDR database so that it is active when PowerSDR is restarted. The default setting for this option is unchecked.
8. **Frequency Calibration no Longer an Expert option.** The Frequency calibration routine is no longer designated as an "expert" user option making it more convenient for performing frequency fine tuning.
9. **Improved accuracy for Frequency Calibration.** The number of sampled data points used for the Frequency Calibration routine has been increased for greater accuracy.

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## Enhancements and Bug Fixes Incorporated in Release v2.7.2

Below is a listing of program changes, enhancements and defects corrected in this release of PowerSDR.

US2056	Add support for the new Firewire driver version 4.1.3.17357
US1778	Transmit compliance and associated band plans added for Japan and IARU Region 3 (TURF)
US1665	DB: Added a feature to properly close the DB on a Windows forced shut down
DE1051	CAT: The MOX button will switch to RX if TX was initiated using the ZZTX command
DE1789	Console: Enhanced the waterfall display to show greater signal resolution and detail
DE1078	Console: Fixed incorrect preamp settings on frequency change if band was not changed
DE1063	Console: Fixed a Panadapter frequency label formatting issue due to Windows localization
DE1051	Console: Fixed NR, ANF and NB not being turned off when a DIGx mode is selected for RX2
DE651	Console: Fixed inconsistent mode behavior when using A>B in Split mode
DE1543	PSDR-DT: Fixed a defect that required DataTransfer to run as administrator to function
DE1050	RX2: Noise reduction was not being turned off on RX2 when a digital mode was selected
DE1061	Setup: Fixed a defect that prevented the Mic Boost from being enabled
US1766	Setup: RX2 options disabled for FLEX-5000 without a RX2 installed. RX2 Options hidden for all other SDRs
US1779	Setup: Added an option to remember the selected TX profile by RX1 mode
US1776	Setup: The accuracy of the frequency calibration routine has been improved
DE1539	Setup: Fixed a defect where frequency calibration data could be set to greater than 65 MHz
US1759	Setup: The Frequency calibration routine is no longer designated as an "expert" user option
US1773	Wave: Added the ability to select the recording sample ratio for post-processed recordings

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## Database Import Recommendations and Cautions

Configuration data for PowerSDR is contained in a database that is PowerSDR version specific, meaning that the database elements or schema for one version of PowerSDR may not be compatible with a different version of PowerSDR. This difference in database schema can complicate migrating user configuration settings after upgrading to a new version of PowerSDR. There are two methods for transferring radio configuration settings from one version of PowerSDR to the next. One is the "Import method" using the PowerSDR Setup form and the other uses the PowerSDR-DataTransfer™ Utility.

The *Setup Form Import method* is intended to restore databases that were exported from the same version of PowerSDR. If you try to import a database from a different version of PowerSDR or one created with a different radio model, an error will occur.

The *PowerSDR-DataTransfer utility* however automatically accommodates for variations and changes in the database schema between PowerSDR versions that are not accounted for when using Setup Form Import method. Therefore it is highly recommended to use the **PowerSDR-DataTransfer utility** included with this version of PowerSDR for migrating user settings when upgrading PowerSDR from one version to another.

If the default PowerSDR installation options are selected, you will find the **PowerSDR-DataTransfer** program icon on your desktop, in the Windows Quick Start bar or in the FlexRadio Systems Start Menu folder.

For more information regarding the operation PowerSDR-DataTransfer please use the **Help** menu option available from the application menu bar on the right hand side.

**NOTE: If a previous version of SDRDataTransfer is loaded on your PC, it is recommended that you uninstall it and use the PowerSDR-DataTransfer utility.**

If your experience *any* anomalous behavior with your radio after importing data from a database that was created from an earlier version of PowerSDR v2.7.2, **reset your database immediately** using the Factory Defaults feature in the Setup form and do not re-import any data or contact FlexRadio Systems support.

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## Firmware Update Information

### **PowerSDR v2.7.2 requires updated firmware for the FLEX-5000, FLEX-3000 and FLEX-1500**

New firmware required and will be automatically installed when running PowerSDR v2.7.2 for the first time. No manual user intervention is required.

Device drivers and firmware specific for the model of SDR you are operating are automatically installed as part of the software installation & startup process. Do not attempt to manually install a hardware driver or firmware update unless specifically requested by FlexRadio Customer Support. Do **not** power off your radio or shut down PowerSDR if a firmware or device driver installation is being executed.

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## Firewire Driver Information (FLEX-5000 and FLEX-3000 only)

**OPERATIONAL NOTICE:** Starting with PowerSDR v2.4.4, a new 4.x Firewire driver is utilized whose architecture is completely different from the previous 3.x driver family.

There is also a 4.x firmware dependency for the FLEX-5000 and FLEX-3000 which is **NOT** backwards compatible with previous versions of PowerSDR. Once you install PowerSDR v2.4.4 or greater *you will not be able to run any versions of PowerSDR previous to PowerSDR 2.4.4* which utilized the older 3.x Firewire driver and firmware.

You can however revert back to the previous 3.x Firewire driver. If you need to revert to a previous version of PowerSDR (less than v2.4.4), then follow the procedure #1 listed below in the [FLEX-5000 and FLEX-3000 Operation Notes](#) section of these release notes.

**The following caveats are only applicable after installing the 4.1.3 Firewire driver.** After installing PowerSDR v2.7.2 and greater which automatically installs the updated FLEX Firewire driver 4.1.3.17357, *you will not be able to run any versions of PowerSDR previous to v2.7.2* because one of the driver components is not backwards compatible with the 4.0.0 or 4.1.1 Firewire drivers. This condition is indicated by a message requesting a firmware update when PowerSDR is started, but PowerSDR cannot properly identify your FLEX-5000 or FLEX-3000, as it asks you what type of radio you are using. If you experience this problem, click **NO** to exit the initialization of the earlier version of PowerSDR.

There is however a workaround to make previous versions of PowerSDR that used the 4.1.1 or 4.0.0 Firewire driver operational. Manually copy the **pal.dll** file from the PowerSDR v2.7.2 application folder to the PowerSDR v2.4.4 or greater application folder. This will allow you to run those two versions of PowerSDR with the new 4.1.3.17357 Firewire driver.

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## Known Issues or Recommendations with New Features Included in this Release

**FLEX Firewire Driver 4.1.3:** The FLEX Firewire driver will be updated to version 4.1.3.17357 with PowerSDR v2.7.2. This new driver has several bug fixes and performance enhancements over the previous 4.1.1 Firewire driver.

Make sure that you power on your FLEX-5000 and/or FLEX-3000 and allow it to complete the Firewire driver installation after your PC has rebooted and **BEFORE** you start PowerSDR v2.7.2. ***For Windows XP systems, make sure you install all three (3) driver components when prompted.*** For Windows Vista and greater, the Firewire driver installs automatically without user intervention; just wait for the message that your new hardware is ready to use.

Trying to run a version of PowerSDR 2.3.5 or earlier with the 4.x version of the Firewire driver will result in errors when you start PowerSDR indicating that a firmware update is needed when the updated the firmware has already been installed by PowerSDR v2.7.2. Click **NO** to exit the initialization of PowerSDR and run a version of PowerSDR v2.4.4 or greater.

**New Transmit Frequency Modifications and Band Plans for Japan and IARU Region 3 Entities:** In order to enable this feature, your specific radio will need to have its firmware modified (TURFed) via a radio specific software update. To request this firmware modification, please submit a support type HelpDesk ticket requesting the TURF upgrade.

## PowerSDR 2.7.2 Installation Information

### PowerSDR 2.x Software Installation/Upgrade Recommendations and Guidelines

Please read all of the following guidelines and follow the recommendations to ensure a trouble free upgrade of your software defined radio to PowerSDR v2.7.2.

The instructions below are applicable for users that already have *a previous version of PowerSDR v2.x* installed on their PC. **If you have the older PowerSDR v1.x currently installed, please see the Prerequisites for FLEX-x000 Users Upgrading from PowerSDR 1.x to PowerSDR 2.x in the section below.**

1. Minimum required CPU for PowerSDR v2.7.2 and greater is an Intel Pentium IV and an AMD Athlon 64 / Operon and greater. Lesser processors do not have the necessary SSE2 capability needed for the DSP engine.
2. The minimum version of Windows supported by PowerSDR v2.7.2 and above is Windows XP Service Pack 3 (SP3). If your Windows XP PC has not been upgraded to SP3, you must do so before installing PowerSDR v2.x. See Minimum Windows and .NET Requirements below for obtaining Win XP SP3.
3. It is **not necessary or recommended** to uninstall any previous versions of PowerSDR 2.x before installing PowerSDR v2.7.2. In fact, it is not recommended that you uninstall previous versions of PowerSDR unless you uninstall **all** previous versions so that files and drivers installed as dependencies with previous versions are all properly removed before installing PowerSDR v2.7.2
4. It is **not necessary or recommended** to manually remove the Firewire driver before installing PowerSDR v2.7.2. Doing so after PowerSDR v2.7.2 is installed will make your FLEX-5000 / FLEX-3000 inoperable. Do not install any standalone versions of the Firewire driver either.
5. The PowerSDR v2.x installer requires administrator level rights to install the kernel mode device drivers for the various SDR radios. The Installer should automatically elevate to this level of rights when run regardless of the current user rights, but if you are in doubt that your login has full administrator rights or you are getting errors indicating files cannot be found, you need to right click on the PowerSDR v2.x Integrated Installer icon and select the "Run As..." option and run the Installer with the administrator account, and not your login account ID.
6. The PowerSDR v2.x Installer no longer prompts the user for radio options. All drivers are now pre-loaded to eliminate the need to re-install a version of PowerSDR in order to load a needed device driver.
7. Firmware updates, if needed, are applied automatically when running the new version of PowerSDR for the first time. Do **not** stop the firmware installation until it has fully completed or your radio may not operate properly thereafter.
8. See additional operation notes regarding your specific model radio later in this document.
9. If you are installing a FlexControl with PowerSDR v2.7.2 **for the first time**, please read the *FlexControl Installation Errata Sheet* shipped with the FlexControl regarding use with Virtual Serial Port software prior to installation. You may need to remove any existing virtual com port pairs you have defined before installing PowerSDR and the FlexControl drivers. This is not necessary if you have an existing operational FlexControl connected to your PC.

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## Minimum Windows and .NET Requirements

PowerSDR 2.x is a Windows 32-bit .NET application designed to operate on Windows XP SP3, Vista, Windows 7, Windows 8 and Windows 8.1. The .NET 3.5 SP1 Framework is required. PowerSDR v2.x will run on 32 or 64-bit operating systems.

As of July 13, 2010, Windows XP SP2 (service pack 2) is no longer supported or actively updated by Microsoft, therefore if your PC is running Windows XP SP2, you must install Service Pack 3 (SP3) before installing PowerSDR v2.7.2. The PowerSDR 2.x Integrated Installer will check for this dependency and inform you if your PC does not meet the minimum XP Service Pack requirements.

For more information regarding upgrading your PC to Windows XP SP3, refer to [Learn how to install Windows XP Service Pack 3 \(SP3\)](http://windows.microsoft.com/en-US/windows/help/learn-how-to-install-windows-xp-service-pack-3-sp3) (<http://windows.microsoft.com/en-US/windows/help/learn-how-to-install-windows-xp-service-pack-3-sp3>) on the Microsoft web site.

If you need to install the .NET 3.5 SP1 Framework, the PowerSDR 2.x Integrated Installer will either install .NET 3.5 SP1 from the installation CD or try and download the necessary software from the Internet. Alternately, you can download it directly from Microsoft using this web link before running the PowerSDR Integrated Installer: <http://www.microsoft.com/en-us/download/details.aspx?id=25150>

## Obtaining Technical Support

If you encounter issues installing or operating PowerSDR v2.7.2 with FlexRadio's software defined radios, please contact FlexRadio Systems technical support by opening a HelpDesk support ticket on-line at <http://helpdesk.flexradio.com> or by phone at +1 (512) 535-4713 extension #2. Please leave a voice mail message if you don't get an answer as all of our engineers are probably busy on existing calls.

**Hours of Operation.** Our Technical Support engineers are available Monday – Friday from 9:00am-5:30pm Central Time. If you call after business hours, on a holiday or weekend, please leave a detailed message and we will return your call in the order it was received during regular business hours.

You may always submit a HelpDesk support ticket at any time.

If you need assistance opening a HelpDesk ticket, please refer to the following web page for detailed instructions. <http://support.flexradio.com/>

## Troubleshooting FLEX-5000 and FLEX-3000 Connectivity Issues

With the new FLEX 4.x Firewire driver, its improved streaming performance can expose weaknesses and deficiencies in your PC configuration that may result in your FLEX-5000 or FLEX-3000 not being able to properly communicate with the computer after upgrading. It may not connect at all, stop working after a few minutes or freeze when changing sampling rates or buffers. There can be several reasons for these failures, such as Firewire cards that are not fully supported by the new Firewire device driver, Windows OHCI 1394 driver incompatibilities with certain Firewire cards or PCIe bus timing problems. Additionally, PCs that worked perfectly well with the older 3.x interrupt driven Firewire driver may now fail to work properly because the new streaming 4.x Firewire driver, which fully utilizes the 1394 Firewire interface's capabilities, has exposed these existing deficiencies that previously did not result in operational issues.

There are several factors that come into play for proper Firewire communication between the PC and the radio hardware, such as utilizing a compatible Firewire card, operating system version and PC motherboards. These different inter-dependent variables present a unique challenge for troubleshooting the primary cause of the Firewire communication failure.

If you experience these problems, your best course of action is to submit a support [HelpDesk](#) ticket so one of our Technical Support Engineers can systematically triage your connectivity problem. Our support engineers have the experience and expertise to quickly analyze and in some cases resolve the problem with a simple system configuration change. However, if you would like to troubleshoot the problem yourself, below are a few troubleshooting steps that you can try on your own.

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### Failure of Sampling Rate to Properly Initialize Resulting in a Flat Line Display

Since the Analog to Digital Converter (ADC) is internal to the radio hardware and it is always operational which means that it is running at a particular sampling rate when the radio is powered on. Under normal circumstances, when PowerSDR is started, it is set at the same sampling rate as the radio hardware so there is no sampling rate re-initialization that takes place and the radio is running. Under certain circumstances however, such as importing data from a previous database with PowerSDR-DataTransfer or manually changing the radio's sampling rate when PowerSDR is not running, the radio may fail to change to the new sampling rate when PowerSDR is started for the first time. This results in a "flat line" display on the Panadapter and no receive audio.

To resolve this issue, shut down PowerSDR and restart it. In most cases this action will resolve the flat line display issue. If not, please use the other troubleshooting steps listed below or submit a support [HelpDesk](#) ticket.

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### Checking the Compatibility of your Firewire Card

There is a utility in the FLEX Firewire control panel that allows you to verify that your OHCI Controller (Firewire card) is compatible with the FLEX 4.0 Firewire driver.

Please refer to the HelpDesk article [Verifying Firewire Card Compatibility with the FLEX Firewire Driver](#) for a step-by-step procedure for verifying Firewire Card compatibility.

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## VIA Firewire cards and Windows 7

We have determined that Firewire cards using the VIA chipset and some others that are running on Windows 7 have a higher probability of Firewire related connectivity issues when using the default Windows 1394 bus driver. If you are using a VIA Firewire card, please check that your Windows 1394 bus driver is using the “Legacy” version if you are experiencing connectivity issues. This change may also benefit other Firewire cards that are experiencing connectivity problems running on Windows 7.

If you have checked the compatibility of your Firewire card using the procedure above and it is has a VIA chipset, then refer to the HelpDesk article [Setting the Win7 1394 Bus Driver to the Legacy Version](#) for a step-by-step procedure for changing your Windows 7 OHCI Compliant Host Controller driver to the legacy version.

Note that after a Windows update, the Windows 7 OHCI Compliant Host Controller driver may be changed from legacy version back to the native driver, resulting in your radio having connectivity issues after previously running properly. If your PC stops working mysteriously, re-check to make sure your PC is still configured to the legacy Windows 7 OHCI Compliant Host Controller driver.

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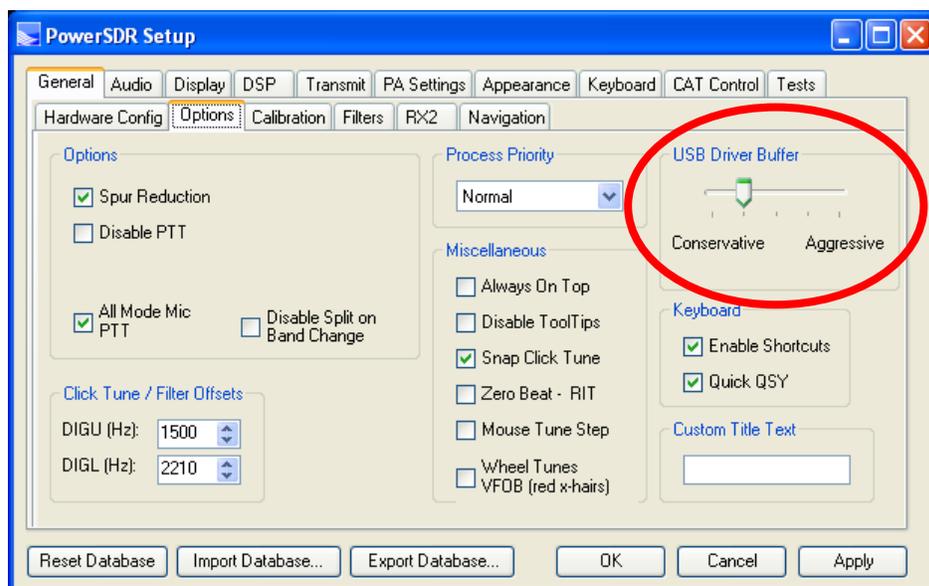
## FLEX-5000 and FLEX-3000 Operation Notes

1. If you need to revert your FLEX-5000 or FLEX-3000 back to a version of PowerSDR less than v2.4.4 which uses the 3.x version of the Firewire driver, follow the procedure below:
  - A. Shut down PowerSDR and power off your software defined radio.
  - B. If the FLEX Firewire control panel is open, close it.
  - C. Un-install PowerSDR v2.4.x (or greater) using either the Control Panel method or by using the uninstall PowerSDR option in the Start Menu (FlexRadio Systems->PowerSDR application folder)
  - D. Using the Windows Control Panel, select the Remove Program applet.
  - E. Look for any instances of the FLEX Firewire driver. They will be listed as a variant of FlexRadio 3.x.x and or 4.x.x. Remove all instances of the FlexRadio Firewire driver.
  - F. If installed, uninstall PowerSDR v2.3.5 using the Control Panel's Remove Program applet
  - G. Reboot your PC.
  - H. Download the applicable manual Firmware Installation program for your radio.  
**Do not run the manual firmware installer at this time**
    - a. FLEX-5000 Firmware: v1.3.0.8 <http://support.flexradio.com/Downloads.aspx?id=287>
    - b. FLEX-3000 Firmware: v1.2.5.6 <http://support.flexradio.com/Downloads.aspx?id=289>
  - I. Download PowerSDR v2.3.5 <http://support.flexradio.com/Downloads.aspx?id=393>
  - J. Run the PowerSDR 2.3.5 Installer setup program. This will install the v3.5.5 Firewire driver. Reboot your PC when prompted.
  - K. After the PC has completely booted up, power on the FLEX-x000 and allow the Firewire driver to complete its installation. For Vista and Win7 operating systems this is performed silently without any user intervention. For XP systems, the user will have to confirm three sub-driver installations.
  - L. **DO NOT START PowerSDR v2.3.5.** Run the manual FLEX-5000 or FLEX-3000 firmware installer downloaded in Step H. Wait for the relay click after the firmware loads. (you can power cycle the radio if you are unsure that the relay clicked)
  - M. Verify that the Firewire driver is properly installed by opening the FLEX Firewire Driver Control Panel. The FLEX-x000 should be a recognized device.
  - N. Start PowerSDR v2.3.5 and proceed with the initial setup wizard. You will be prompted to do a firmware update. Click OK to do the firmware update. Also you will be prompted if your radio is a FLEX-5000, if it is, acknowledge that prompt. If your radio is a FLEX-3000, click NO until you are prompted if your radio is a FLEX-3000, then acknowledge that prompt.
  - O. After the firmware install has completed, PowerSDR will be shut down. Restart PowerSDR v2.3.5
  - P. You should see the EEPROM data transfer dialog boxes indicating your radio is working properly. PowerSDR v2.3.5 will start normally. You may have to toggle the stop/standby button to get the audio stream to initialize the first time you start it.
2. You can run a FLEX-x000 SDR and a FLEX-1500 on the same PC at the same time. A radio "Chooser" will appear to allow you to select which radio you would like to operate. The software now keeps track of the database files for you. Just click "USE" next to the radio you want. If USE is grayed out, then check to make sure the radio is properly powered up.

***NOTE: Currently you must start the FLEX-1500 FIRST for multiple radios to operate properly. Also, you can only have one (1) USB-based radio and one (1) Firewire based radio operating at one time.***
3. To prevent the possibility of a conflicted hardware state with the Firewire card and the FLEX-5000 or FLEX-3000 resulting in a system crash or hang, set your Windows Power Options for **High Performance** so the PC does not go to "sleep" or into hibernation mode while the SDR is connected and powered up.

## FLEX-1500 Operation Notes

1. Do not boot your computer with the FLEX-1500 powered up or the streaming USB drivers may not properly load. Use the following Power Up / Power Down sequence:
  - a.) Power off or make sure the FLEX-1500 is powered off
  - b.) Boot the PC and allow Windows to completely initialize
  - c.) Power on the FLEX-1500 and wait several seconds for Windows to load the drivers
  - d.) Start PowerSDR
  - e.) Shut down PowerSDR and wait several seconds for the database to close.
  - f.) Power off the FLEX-1500
  - g.) Shut down Windows
2. Performance optimization: The FLEX-1500 utilizes a real time driver to communicate between PowerSDR and the radio via USB. There are two steps to optimize the streaming performance of the USB interface. This varies by PC. Just because you have the fastest processor out today does not automatically mean that your PC's USB controller will achieve maximum performance. We have created a control to match the USB driver buffer streaming to your specific hardware. There are two steps to this process.
  - a. USB Driver Buffer control: The USB Driver Buffer control allows optimization of the low level USB stream. This control is found on the Setup/General/Options form as seen below. *Note that PowerSDR must be in standby in order to change this control.* The default setting has been chosen to allow successful startup of PowerSDR on most machines but may not provide optimal performance on your specific PC. More aggressive settings reduce latency and improve keying performance in CW. More conservative settings will allow lower performing USB controllers and/or CPUs to function smoothly. Choose the most aggressive setting that provides stable operation without popping or distortion of the received signal.



- b. Audio Buffer Size: We recommend use of the smallest audio buffer setting on the Setup/Audio/Primary form that provides un-distorted audio and smooth CW keying. These will reduce latency to a minimum. The exact settings are dependent on your computer hardware but will usually be 512 or 256.
3. Using the FLEX-1500 on the same USB controller as low-speed devices, such as a mouse or keyboard will result in the FLEX-1500 be forced to a lower data transfer rate which will *significantly* affect the performance of the radio in regards to latency which is most evident when operating CW. Refer to this KB article regarding the use of USBDeview to determine if the FLEX-1500 is using the same USB controller as other USB devices (<http://kc.flexradio.com/KnowledgebaseArticle50459.aspx>)
4. You can run a FLEX-x000 SDR and a FLEX-1500 on the same PC at the same time. A radio “Chooser” will appear to allow you to select which radio you would like to operate. The software now keeps track of the database files for you. Just click “USE” next to the radio you want. If USE is grayed out, then check to make sure the radio is properly powered up.

***NOTE: Currently you must start the FLEX-1500 FIRST for multiple radios to operate properly. Also, you can only have one (1) USB-based radio and one (1) Firewire based radio operating at one time.***

5. To prevent the possibility of a conflicted hardware state with the USB controller and the FLEX-1500 resulting in a system crash or hang, set your Windows Power Options for **High Performance** so the PC does not go to “sleep” or into hibernation mode while the SDR is connected and powered up.

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## SDR-1000 Software Support Notice

Starting with PowerSDR v2.6.x, FlexRadio Systems formally announces the "End of Software Support" for the SDR-1000 transceiver. Repair services and technical support for the SDR-1000 transceiver will continue under the following conditions until further notice:

1. FlexRadio will continue to provide repairs on the SDR-1000 as long as components and subsystems are available. Please submit a HelpDesk support request for an RMA before sending in your SDR-1000 for repair.
2. While many SDR-1000 users enjoy some of the features of PowerSDR v2.x, the last RECOMMENDED stable version of PowerSDR for the SDR-1000 is v1.18.6. It is available at <http://support.flexradio.com/Downloads.aspx?id=322>
3. Customer support for the SDR-1000 will continue to be available via the [FlexRadio HelpDesk](#). TELEPHONE SUPPORT FOR THE SDR-1000 WILL NO LONGER BE PROVIDED.
4. A full set of documentation for the SDR-1000 can be found on the Knowledge Center at: <http://kc.flexradio.com/KnowledgebaseCategory50.aspx>
5. For user supported software fixes and enhancements, versions of PowerSDR that support the SDR-1000, which are licensed under the GNU Public License (GPL), are available for continued development by sending a request for source code to [gpl@flexradio.com](mailto:gpl@flexradio.com).

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