

FLEX-5000™ Troubleshooting Guide

Updated on: 7-August-2009

Below are some resolutions to common problems you may encounter during the initial setup and operation of the FLEX-5000A. If you cannot find a resolution to your problem from this document or from the Knowledge Center (<http://kc.flex-radio.com>), please contact FlexRadio Support at the phone number or e-mail address below.

FlexRadio Systems Technical Support Contact Information:

+1 (512) 250-8595 -or- support@flex-radio.com

Trouble Condition or Error: After loading the FLEX Firewire driver and rebooting your PC, turning on the FLEX-5000 never finishes the installation of the device driver.

Installing the FLEX Firewire device driver is a two-step process. The first step is to load the driver and reboot the PC. The second step is to turn on the FLEX-5000 allowing Windows to detect the newly connected hardware and installing the device drivers for the FLEX-5000 that was loaded in step 1. The error occurs during the second step where Windows never detects the FLEX-5000 after it is turned on.

Possible Causes and Resolutions:

- 1.) Malfunctioning Firewire host controller.
- 2.) The Firewire cable is not connected to either the FLEX-5000 or the computer.
- 3.) Motherboard integrated Firewire Host Controller is not enabled in the system BIOS.
- 4.) The Firewire Host controller is not recognized by Windows
 - See Knowledge Center Article:
[How to Verify your FireWire Host Controller is Working Properly \(http://kc.flex-radio.com/KnowledgebaseArticle50336\)](http://kc.flex-radio.com/KnowledgebaseArticle50336)

Trouble Condition or Error: The receiver works fine but there is no power output on transmit. Also I do not hear a relay clicking when pressing PTT

Possible Causes and Resolutions:

- 1.) PowerSDR is in "receive only mode". Open the PowerSDR 1.x Setup applet, check the General -> Hardware Config section, and make sure the option **Receive Only** is NOT checked.
- 2.) PTT is disabled. Open the PowerSDR 1.x Setup applet, check the General -> Options section, and make sure the option **Disable PTT** is NOT checked.

Trouble Condition or Error: "Hardware Not Found" error

If you receive a Hardware Not Found error, indicated by the screen below, it is the result of PowerSDR not being able to communicate with the FLEX-5000.



Possible Causes and Resolutions:

- 1.) The FLEX-5000 is not powered up (turned on).
- 2.) The Firewire cable is not connected to either the FLEX-5000 or the computer.
- 3.) The FLEX-5000 Firewire driver is not installed correctly.
- 4.) Malfunctioning Firewire host controller.
- 5.) Additional Firewire devices connected to the same Firewire host controller as the FLEX-5000. Disconnect the other Firewire devices.

Trouble Condition or Error: There is a significant delay heard in the headphones when the MON (monitor) is enabled.

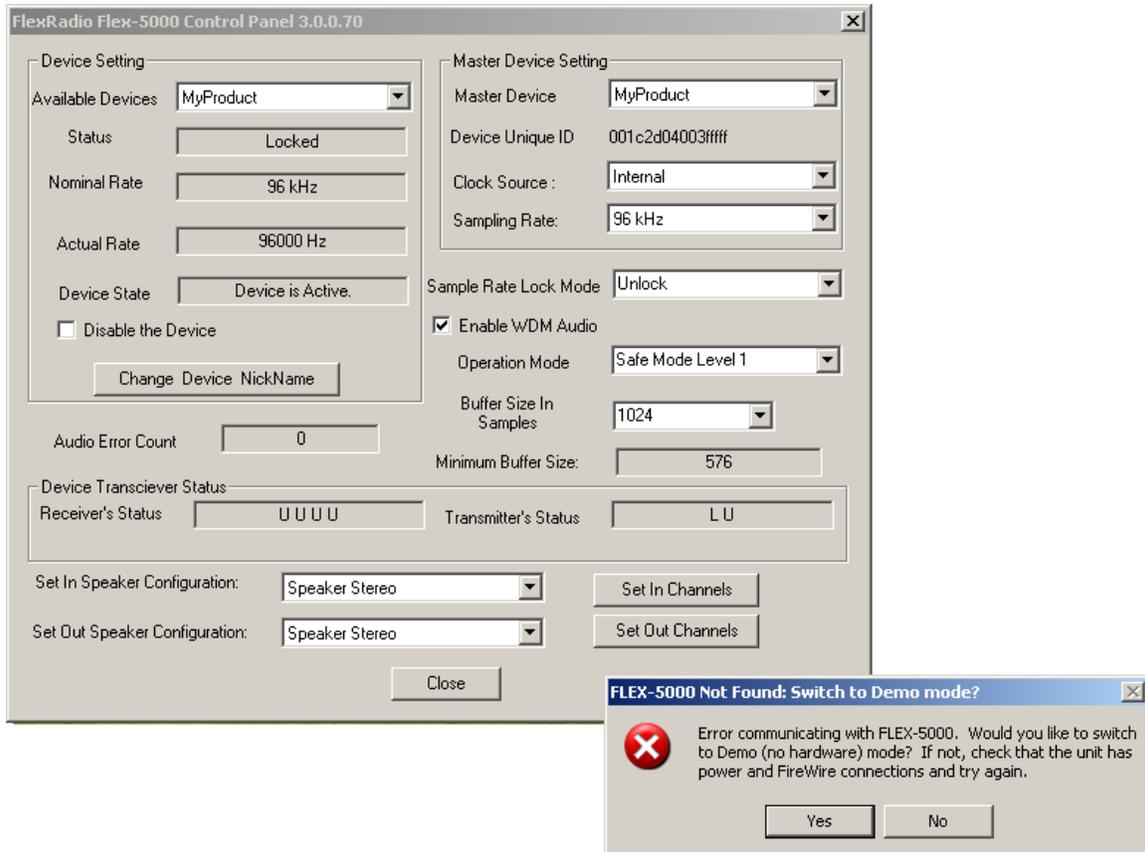
Unlike traditional radios with discrete AF preamp electronics, the DSP functions necessary to process the audio is not simultaneous or in absolute real-time. This is the inherent latency in the radio/software system and is normal. If the delay is too long, the following suggestions can reduce it.

Possible Causes and Resolutions:

- 1.) Set the audio sampling rate to a higher value (96 or 192 KHz).
- 2.) Reduce the size of the audio buffers in PowerSDR and in the FLEX Firewire Control Panel.
- 3.) Make sure the audio buffers and sampling rate configured in PowerSDR and the FLEX Firewire Control Panel are the same.
- 4.) Process priority is too low. Open the PowerSDR 1.x Setup applet, check the General -> Options section, and change the option **Process Priority** to a higher level.
- 5.) The PC may not have enough resources to run at higher sampling rate or is not operating in an optimized manner.
- 6.) The PC may have programs running (foreground and/or background) that are robbing your PC of the necessary performance to run a real-time audio processing application such as PowerSDR 1.x.

Trouble Condition or Error: "FLEX-5000 Not Found: Switch to Demo mode?" error is displayed, but the FLEX Firewire Control Panel recognizes the FLEX-5000 as being attached.

The screen below shows a "FLEX-5000 Not Found: Switch to Demo mode?" error but the FlexRadio FLEX-5000 Control Panel is properly communicating with the FLEX-5000.



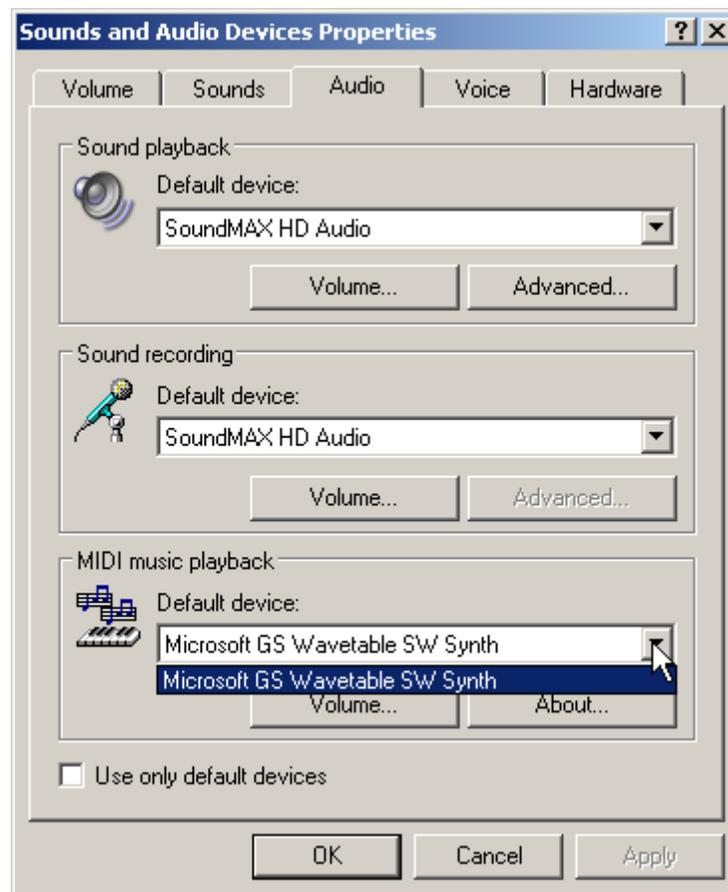
Possible Causes and Resolutions:

- 1.) The FLEX-5000 MIDI driver(s) did not register or is not installed correctly. Remove the FLEX Firewire driver, reboot and reinstall the FLEX Firewire driver. Verify that the FLEX MIDI device driver is registered with Windows. (See below).
- 2.) The FLEX-5000 is not powered up (turned on).
- 3.) The Firewire cable is not connected to either the FLEX-5000 or the computer.
- 4.) The Firewire cable is not properly oriented (inserted) in the FLEX-5000
- 5.) Additional Firewire devices connected to the same Firewire host controller as the FLEX-5000. Disconnect the other Firewire devices.

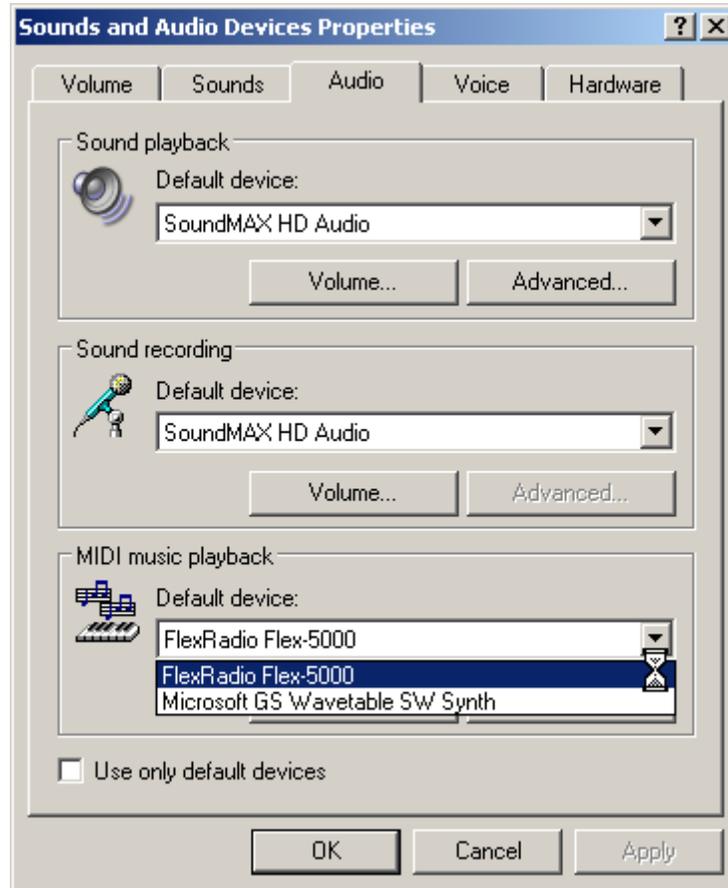
To verify the FLEX-5000 MIDI driver is properly installed execute the following procedure.

(NOTE: This control panel is not visible with Windows Vista)

- a.) Open the Windows XP Control Panel.
- b.) Double left click on the Sounds and Audio Devices Control Panel applet.
- c.) Left click on the Audio tab.
- d.) Left click on the MIDI music playback, default device drop down box.
- e.) Verify that the FlexRadio Flex-5000 is an option. If the FLEX-5000 is the only MIDI device on your computer, select it as the default device. The screen below shows an improperly installed FLEX-5000 MIDI device (FLEX-5000 MIDI device not is shown).



The screen below shows a properly installed FLEX-5000 MIDI device.



Trouble Condition or Error: No Audio can be heard but there appear to be weak signals on the Panadapter

Possible Causes and Resolutions:

- 1.) The FLEX-5000 Mixer is not set to the correct output device or the gain is set too low.
- 2.) Your powered speakers are malfunctioning or not powered on.
- 3.) The 1/8" TRS plug has become disconnected from the FLEX-5000 Powered Speaker Output or is not plugged in completely.
- 4.) The MUT (mute) button is engaged on the PowerSDR console
- 5.) An incorrect receive antenna connector has been selected for that band which has either no antenna connected to it or one that is not resonant for the band selected.
- 6.) If using the RX loop feature, the device in-line is turned off or malfunctioning.
- 7.) The AF Gain or AGC-T Control on the front panel is set too low.
- 8.) Mono (TS) headphones are being used. Use only stereo headphones.

Trouble Condition or Error: No transmit audio. No transmit audio seen on the Panadapter.

Possible Causes and Resolutions:

- 1.) The FLEX-5000 mixer is not set to the correct input or the input gain is set too low.
- 2.) Faulty microphone wiring or incorrect wiring of the MIC or BAL LINE IN connector.
- 3.) Mic gain set too low.
- 4.) Using a DIGIx operating mode rather than SSB, AM or FM.

Trouble Condition or Error: Receiving High SWR Warnings during transmit.

Possible Causes and Resolutions:

- 1.) The antenna you are using has an SWR in excess of 3.0:1 on the band selected.
- 2.) You have the incorrect transmit antenna connector selected for all bands (Antenna Selection Simple mode).
- 3.) You have the incorrect transmit antenna connector selected for the band you are on (Antenna Selection Expert mode).
- 4.) Faulty coax or connector.
- 5.) Water in coax or connector.
- 6.) Antenna is disconnected from the coax
- 7.) Trying to operate 6m on an antenna other than ANT3 (applicable only to FLEX-5000s with the HRFIO 27C boards).
- 8.) Coax disconnected from the FLEX-5000.

Trouble Condition or Error: Popping audio heard in the headphones or very low output audio using the Powered Speaker jack.

Possible Causes and Resolutions:

- 1.) Mono headphones are plugged into the head connector. Stereo headphones are required with an impedance of at least 100 ohms.
- 2.) Powered speaker 1/8" TRS plug in not fully inserted into the powered speakers connector on the rear of the FLEX-5000.

Trouble Condition or Error: FLEX-5000 Power Indicator LED does not light up after pressing the power switch

Possible Causes and Resolutions:

- 1.) The 13.8 VDC power supply is not turned on.
- 2.) Broken or loose power cable.
- 3.) Power connector is not completely plugged in.
- 4.) Blown fuse (internal).
- 5.) Blown fuse (external, if applicable).

Trouble Condition or Error: Garbled, raspy or choppy transmit audio on CW and SSB.

Possible Causes and Resolutions:

- 1.) Operating Mode in the FLEX-5000 device driver Control Panel is set too aggressively. Use Safe Mode 1 or Safe Mode 2.
- 2.) The sampling rate and buffer size in the FLEX-5000 device driver Control Panel is not the same as the PowerSDR Audio setup.
- 3.) Audio buffer is too small for the sampling rate.
- 4.) Loose Firewire connection.
- 5.) Old version of firmware is loaded. Upgrade to the latest firmware version.
- 6.) RF getting into the FLEX-5000 or PC via the Firewire cable. Add additional ferrite beads or use a different Firewire cable with additional shielding.

Trouble Condition or Error: Low RF Power Output.

Possible Causes and Resolutions:

- 1.) Low DC voltage. The recommended minimum voltage for the FLEX-5000 is 13.25 VDC (Recommend 13.8 VDC @ 35 amps peak / 25 amps continuous).
- 2.) Database integrity problems – Allow PowerSDR to create a new database (not a database import).
- 3.) The FLEX-5000 requires recalibration of the PA – Contact FlexRadio Support for instructions on how to perform this procedure.

Trouble Condition or Error: Strange Unexpected Behaviors.

Possible Causes and Resolutions:

- 1.) Database integrity problems – Allow PowerSDR to create a new database (not a database import).
- 2.) PowerSDR corruption. Reinstall PowerSDR.
- 3.) Using an alpha version of PowerSDR. If you are experiencing strange behavior and you are using an alpha version (aka a SVN version), use the latest released version of PowerSDR rather than an alpha version.

Trouble Condition or Error: Receiver “goes deaf” when transitioning from transmit to receive and the Panadapter shows a flat signal below -140 dB.

Possible Causes and Resolutions:

- 1.) The most current version of the FLEX-5000 firmware is not installed.

Trouble Condition or Error: PowerSDR “freezes” periodically. Pressing the STOP and START button restarts PowerSDR, but after awhile it “freezes” again.

Possible Causes and Resolutions:

1. Database integrity problems – Allow PowerSDR to create a new database (not a database import).
2. Excessive long duration DPCs (deferred procedure calls). Run the DPC Latency checker to verify that you are experiencing long duration DPCs. Any DPCs that are in excess of 1000uS are excessive.
(http://www.thesycon.de/deu/latency_check.shtml)
3. Operating Mode in the FLEX Firewire Control Panel is set too aggressively. Use Safe Mode 1 or Safe Mode 2.
4. Multiple Firewire adapters enabled on your computer. If you installed a Firewire host controller in one of your PC’s bus slots and you also have a Firewire host controller on the motherboard, disable the on-board Firewire controller using Windows Device Manager.
5. Firewire host controller not providing sufficient throughput. If using a motherboard integrated Firewire host controller, replace it with a bus type (PCI or PCI-E) Firewire host controller.
6. Weak or marginal 13.8 VDC power supply. The power supply must be able to maintain stable voltage under load. Problems have been reported with lower quality switching power supplies.
7. CPU utilization is too high.
8. Computer lacks sufficient resources to run PowerSDR at the current sampling rate.
9. Running other programs at the same time as PowerSDR, which are responsible for using hardware in such a manner that it results in long duration DPCs. MS Outlook and Media Player are just some programs known to cause this condition.
10. PowerSDR audio buffers and the FLEX-5000 hardware buffers are not configured for the same values
11. PowerSDR audio and/or Firewire hardware buffers are set too low for the sampling rate. Increase buffer size or lower the sampling rate.
12. Additional Firewire devices connected to the same Firewire host controller as the FLEX-5000. Disconnect the other Firewire devices.
13. RFI is getting into the computer or the FLEX-5000. Ground your computer to the FLEX-5000 using a low impedance ground connection. Add additional ferrite beads to both ends of the Firewire cable or replace the Firewire cable with one that has additional shielding.

Trouble Condition or Error: Excessive long duration DPCs (deferred procedure calls).

Possible Causes and Resolutions:

1. Out of date or poorly written hardware drivers. Update all of the hardware device drivers on your computer including the motherboard chipset, video and audio drivers.
2. Using a motherboard integrated Firewire host controller. Even though some motherboard manufacturers are starting to use quality Firewire chipsets, the implementation in conjunction with other peripherals integrated on the motherboard significantly degrade its performance to unacceptable levels. Using a bus installed (PCI or PCIe) Firewire host controller is recommended.
3. Upgrade your PC BIOS. Some motherboards have been reported to have excessive long duration DPCs that were directly attributed to poorly engineered BIOS. A BIOS upgrade resolved the problem.
4. Turn off or disable hardware interfaces that are generating the DPCs. In laptops, the Wireless network and Bluetooth adapters have been identified as a major culprit for causing long duration DPCs. Finding them may be a "trial and error" process.
5. Although long duration DPCs are hardware based, some software programs running on the PC can be the triggering mechanism for long duration DPCs. Programs like e-mail clients, firewalls and virus protecting software have been reported to initiate long duration DPCs.
6. PC hardware is not adequate for running PowerSDR or poorly designed for real-time audio applications (such as some laptop computers).
7. Too many hardware devices sharing the same IRQ (interrupt request level) as the Firewire host controller. See KB article [Firewire Host Controller Optimizations for Windows XP](http://kc.flex-radio.com/KnowledgebaseArticle50013.aspx) for more information on how to determine if your Firewire host controller is sharing an IRQ with other hardware. (<http://kc.flex-radio.com/KnowledgebaseArticle50013.aspx>).

Trouble Condition or Error: When starting up PowerSDR after installing the HRFIO board in a FLEX-5000, if you receive an error that the HRFIO board is missing or damaged, then PowerSDR is not recognizing the new HRFIO board.

Possible Causes and Resolutions:

1. There was a serial number mismatch and PowerSDR does not properly recognize the new HRFIO board
2. There was a reassembly error and the 10-pin rectangular ribbon cable connector is not properly seated in the "TO HTRX" (SV1) connector.
3. The HRFIO board is malfunctioning.

The most common problem is that there is a mismatch between what PowerSDR "thinks" is installed and the actual board that is installed (item #1 above). The first step in troubleshooting this error is to verify that PowerSDR has properly recognized the new HRFIO board. Use the following procedure for HRFIO verification.

1. Start PowerSDR. Ignore any errors that may appear regarding the RFIO board by clicking on **OK** and continuing.
2. **Right click** on *Setup* in the PowerSDR menu bar.
3. **Right click** on *General->Hardware Config* tab.
4. In the FLEX-5000 Config section, verify that the new RFIO board number in parentheses () matches the ASSY and REV of the new board and is not in red.

If PowerSDR indicates a mismatch, then you may have to run the EEPROM update tool to modify the data in your EEPROM to match the new board serial number.

You can download this utility from the FlexRadio Systems web site:

[HRFIO EEPROM Updater \(34B\)](http://support.flex-radio.com/Downloads.aspx?id=233)

(<http://support.flex-radio.com/Downloads.aspx?id=233>)