

# QUICK START GUIDE



## **FLEX-6000 Signature Series with SmartSDR™**

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Thank you for purchasing the FLEX Signature Series software defined radio (SDR) from FlexRadio Systems. This Quick Start Guide (QSG) will walk you through the steps for installing the FLEX-6700 or FLEX-6500 in your operating position and loading the SmartSDR for Windows software on a network connected PC in preparation for your first QSO. Please read all included documentation before proceeding and store this guide and all other contents, including the shipping container, for future reference and use.

The Quick Start Guide is designed to get you on the air with minimum effort. To do this, we assume a basic HF installation knowledge and do not delve into all the FLEX-6700 / FLEX-6500 and SmartSDR for Windows' many possibilities.

This QSG provides only the basic steps to set up your FLEX-6500 or FLEX-6700. For more information, you are referred to the FLEX-6000 Signature Series SDR documentation, which can be found in the **Documentation** folder on the CD-ROM that came with your transceiver.

If you run into any trouble during the set-up process, please:

- Re-check your steps.
- Refer to next paragraph, "Need Assistance"

### **Need Assistance?**

If you encounter any issues installing or operating SmartSDR with FlexRadio Systems' Signature Series radios, please use our user support Community (<http://community.flexradio.com>) to search for your trouble issue, as it may have already been answered by other FLEX-6000 Signature Series users.

If you do not find an acceptable answer in the Community, you can 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. For EU countries please contact your national distributor or contact FlexRadio Systems Representative for EU (see back cover). Please leave a voice mail message if you don't get an answer.

### **Hours of operation:**

Our Technical Support engineers are available Monday through Friday from 9:00am to 5:30pm Central Standard Time (CST). If you call after business hours, on a holiday or week-end, please leave a detailed message and we will return your call during regular business hours in the order it was received. You may always submit a HelpDesk support ticket at any time. If you need assistance opening a HelpDesk ticket, please refer to the HelpDesk Assistance Center home page for step-by-step instructions at <http://support.flexradio.com>

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**IMPORTANT NOTICE - READ BEFORE OPERATING THIS UNIT**

**WARNING!**

This radio has been configured to operate in your country according to your nation's regulations. It will operate on frequencies which are not allowed for public use. You are required to have a valid amateur radio license of an appropriate class from your government to have the privileges to operate on amateur radio frequencies.

Except those actions which have been described in the Quick Start Guide and in the FLEX-6000 Signature Series Hardware Manual and SmartSDR Software Manual which are available for this radio, no other manipulations to the radio are allowed. The unit must only be opened and/or serviced by a qualified technician.

Please study the Quick Start Guide and the FLEX-6000 Signature Series Hardware Manual and SmartSDR Software Manual prior to operating the unit. These documents contain important information for safe operation.

If you have any questions due to misunderstanding, translation errors and alike, please refer to the FLEX-6000 Signature Series Hardware Manual and SmartSDR Software Manual first. Please contact the appropriate party for further information.

Radio frequency energy (RF) from transmitters can interact with some electronic devices, such as cardiac pacemakers and defibrillators. Please refer to the implanted pacemaker or defibrillator manufacturer's instructions with respect to precautions to be taken in the vicinity of an amateur radio transmitter. If any interaction or interference with a pacemaker or implanted defibrillator is suspected, **STOP** transmitting immediately.

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**IMPORTANT NOTICE - READ BEFORE OPERATING THIS UNIT**

! – WARNING!

Δ - Caution

i - Information

! – This unit is NOT A TOY. It must not be handled by children nor placed/operated within reach of children.

! – Do not leave packing material for this unit unattended. It may be harmful to children if misused.

! – This unit contains small parts that could be a choking hazard to small children. Do not leave accessories unattended.

! – Do not operate this unit in potentially explosive environments.

! – Never attempt to insert wires or any tools into the interior of this unit during operation. This may cause fire or electric shock.

! – This unit must only be operated with the electrical power described in this Quick Start Guide. NEVER CONNECT THE +13.8VDC POWER CONNECTOR DIRECTLY TO AN AC OUTLET. This may cause a fire, injury, or electrical shock.

! – Never connect or disconnect antennas while in TRANSMIT mode. This may cause electrical shock or RF burns to your skin and damage to the unit.

! - This unit generates Radio Frequency (RF) energy. Use caution and observe proper safety practices regarding your system configuration. When attached to an antenna, this radio is capable of generating RF electromagnetic fields which require evaluation according to your national law to provide any necessary isolation or protection required, with respect to human exposure!

Δ - This unit must only be opened and/or serviced by a qualified technician. Opening the unit may void the manufacturer's warranty.

Δ - Do not operate this unit in areas of extreme humidity.

Δ - Avoid operating this radio in direct sunlight or other areas of extreme heat, excessive vibration, or mechanical force.

Δ - When using earphones, use caution when adjusting the volume to prevent any harm to your hearing.

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## 1.0 GETTING STARTED

Δ - If this unit is intended for use in commercial applications, special safety regulations and cautions may apply to prevent accidents.

Δ - If any defect, abnormal result, or other observations occur that are not covered by this Quick Start Guide; immediately cease operation and contact the manufacturer or local distributor for operational advice or repair of the unit.

i - No other physical modification of this radio is allowed. Any other use or modification (including software changes that affect operational characteristics) will void the manufacturer's warranty.

i - Ensure proper ventilation around the radio; this includes 2" clearance on the sides and back.

i - If you operate this unit in conjunction with an appropriate linear amplifier, always make sure your output power is below the maximum input limits of the amplifier. Consult your amplifier owner's manual for proper connection and operation.

i - Please study the complete Quick Start Guide and Owner's Manual. These documents contain important information regarding the safe operation of this unit. If you have any questions, please contact the manufacturer or local distributor for further information.

### 1.0 GETTING STARTED

#### Supplied Accessories:

The following accessories and materials are included with your FLEX Signature Series SDR. Carefully remove the FLEX-6000 from its shipping container, unpack and identify the items listed below.

- One (1) FLEX-6000 Signature Series Unit (FLEX-6500 or FLEX-6700)
- One (1) FHM-1 Microphone (optional for EU countries)
- One (1) 6 ft. (1.8m) CAT 5 Ethernet cable
- One (1) DC power cord with Anderson Power Pole™ connectors
- One (1) SmartSDR for Windows installation CD
- One (1) Hardware & Software Installation Quick Start Guide
- One (1) Rack Mount Kit Option (if ordered)
- One (1) Handle Kit Option (if ordered)
- One (1) GPS patch antenna and RG-174 coax cable (if GPSDO ordered)

**Additional Required Items Not Supplied with the Radio:**

In addition to the supplied accessories, software and cables supplied with the FLEX-6000 Signature Series SDR, you will need to provide the following:

- An HF-Antenna or dummy load
- A good RF ground.
- Powered stereo speakers (computer type) or stereo headphones.
- A stabilized 13.8V DC power supply, capable of 25A continuous duty.
- A personal computer (PC) running Windows XP Service Pack 3 or above. Either 32 or 64-bit operating systems are supported.
- A 100/1000BaseT Ethernet Access - either an open port on your computer or on your local area network (LAN) Ethernet switch.

**2.0 MAKING THE CONNECTIONS**

The following steps will describe the required connections for getting your FLEX-6000 Signature Series software defined radio on the air.

**First Steps:**

1. Carefully remove the packaged accessories and the transceiver (FLEX-6500 or FLEX-6700) from the shipping carton. Remove the plastic covering from the radio.
2. Identify all of the supplied accessories listed above.
3. Place the radio in your operating position making sure it has adequate ventilation.

**Back Panel Connections**

- 1.) Antenna - Connect an HF antenna with nominal 50 Ohm impedance to one of the SO239 transceiver antenna connectors labeled ANT1 (DEFAULT) or ANT2.



2.) Ground - Remove the thumb screw marked GND. Connect your central station ground to the thumb screw and screw it back into the radio.



3.) Speakers - Connect powered stereo speakers to the jack marked PWR-SPKR using a 1/8" stereo TRS plug.



4.) Power Supply - Connect the ring lug end of the supplied DC power cable to a stabilized 13.8V@25 amps DC power supply. The **RED** wire is positive and the **BLACK** wire is negative. Double check these connections. With your power supply **OFF**, gently insert the Anderson Power Pole end of the DC power cables into the transceiver. **DO NOT** power on the power supply or radio at this time!



5.) Ethernet Connection - Connect one end of the supplied CAT 5 Ethernet cable to the transceiver. The other end of the CAT 5 Ethernet cable can be connected directly to the 100/1000BaseT Ethernet port on your computer if you do not have a wired Ethernet network in your shack. Otherwise connect the CAT 5 Ethernet cable to an open 100/1000BaseT Ethernet port on your firewall/router or Ethernet switch.



For a more detailed description of connecting a FLEX-6000 to a LAN or directly to your PC, please refer to the HelpDesk article "How to Connect Your FLEX-6000 to a LAN"

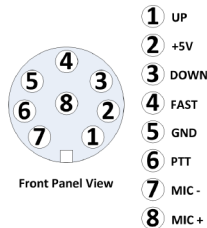
(<http://helpdesk.flexradio.com/entries/23497553-How-to-Connect-your-FLEX-6000-to-a-LAN>).

## Front Panel Connections

1.) Microphone - Connect the FHM-1 microphone or other pin compatible dynamic microphone to the 8-pin Foster microphone jack. (Note: For EU customers, contact your distributor or FlexRadio Systems EU Representative regarding microphone recommendations.)



The pin-out on the microphone jack is as follows:



2.) Phones (Headphones) - Connect a pair of stereo headphones to the jack marked **Phones** using a 1/4" Stereo (TRS) plug. This connection is optional if you are using Stereo Speakers connected to the back panel.



3.) Key/Paddles/Keyer - Connect your CW paddles, keyer or straight key to the jack marked **KEY** using a 1/4" stereo (TRS) plug. Optionally you can use a 1/4" mono (TS) plug for connecting a straight key.



For paddles or a keyer, connect the TRS tip to DOT, Ring to DASH and Sleeve to common. For a straight key, using a TRS plug, connect TRS tip to KEY and Sleeve to common. Do NOT connect the TRS Ring. If using a TS plug with a straight key, connect the tip to KEY and the Sleeve to common.



3.0 GETTING TO KNOW YOUR FLEX-6000 SIGNATURE SERIES RADIO

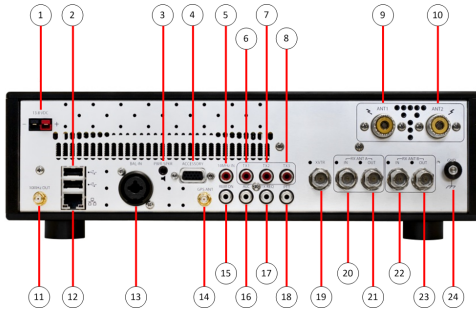
**3.0 GETTING TO KNOW YOUR FLEX-6000 SIGNATURE SERIES RADIO**

Below is a description of the FLEX-6700 and FLEX-6500 front and rear panel controls and connectors.



**FLEX-6700 / FLEX-6500 Front Panel**

1	Microphone: 8-pin Foster, female
2	Stereo Headphone: 1/4" (0.64cm) TRS phono connector
3	CW Key / Paddle: 1/4" (0.64cm) TRS phono connector
4	LED Status Display Indicator
5	Configuration Keypad
6	Power Button with colored LED status indicator



### FLEX-6700 Rear Panel

1	DC Power Input: Anderson Power Poles - 25 amps@13.8VDC
2	USB 2.0 Port (x2): for peripheral connections
3	Powered Speaker: 1/8" (0.32cm) TRS phono connector
4	Accessory Connector: DB-15HD - see pin out in FLEX-6000 HW manual
5	10 MHz Reference Clock Input: RCA connector
6-8	TX Relay Output #1, #2, #3: RCA connectors

9-10	Transceiver Antenna Ports #1 and #2: SO-239
11	10MHz Reference Output: SMA connector (with GPSDO option only)
12	Twisted Pair Ethernet port: RJ-45 - 100/1000 Twisted Pair
13	Balance Audio Input: 3-pin XLR / 1/4" (0.64cm) TRS phono connector combo
14	GPS Antenna Input: SMA connector - (with GPSDO option only)
15	Remote Power On: RCA connector
16	External amplified ALC Input: RCA connector
17	TX Request Input: RCA connector
18	PTT Input: RCA connector
19	Low Level Transverter RF input / output: BNC connector
20-21	SCU-A RF Input: BNC Connector / SCU-A RX Loop Output: BNC
22-23	SCU-B RF Input: BNC Connector / SCU-B RX Loop Output: BNC
24	Chassis Ground: #8 Thumb screw

#### 4.0 INSTALLING SMARTSDR™ FOR WINDOWS APPLICATION ON YOUR PC

The SmartSDR™ for Windows application is the software used to interface with the FLEX-6000 radio hardware for viewing spectrum and controlling the radio.

##### Recommendations and Requirements

Minimum recommended CPU for SmartSDR for Windows is the Intel® Core™ 2 Duo or AMD® Athlon™ 64 x2 processor.

##### Minimum Windows and .NET Requirements

SmartSDR is a 64 and 32-bit Windows .NET Framework application designed to operate on Windows XP SP3, Vista, Windows 7 and Windows 8. The .NET Framework 4.0 Client Profile is required.

The minimum version of Windows supported by SmartSDR is Windows XP Service Pack 3 (SP3). The SmartSDR for Windows Installer will automatically detect your current Windows version and will notify you if it does not meet the minimum operating system requirements. If your Windows XP PC has not been upgraded to SP3, you must do so before installing SmartSDR. See minimum Windows and .NET requirements below for obtaining the Windows XP SP3 software update.

If you need to install SP3 for Windows XP, install it before installing the .NET Framework 4.0 Client Profile. The easiest method for obtaining it is to use the Windows Update service. An optional update method is to download the SP3 update software via the Internet directly from Microsoft using this web link:

<http://www.microsoft.com/en-us/downloads/details.aspx?id=24>.

Note: this is a very large download (approximately 316 MB) which may take over an hour to download using slower Internet connections.

If you need to install the .NET Framework 4.0 Client Profile, the SmartSDR for Windows Installer will automatically install it from the SmartSDR Installation CD or attempt to download the necessary software from the Internet if the CD is not available. Alternately, you can download it directly from Microsoft using this web link BEFORE installing SmartSDR for Windows.

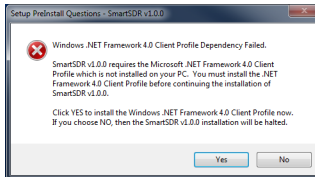
<http://www.microsoft.com/en-us/download/details.aspx?id=17113>.

## Installing the Software

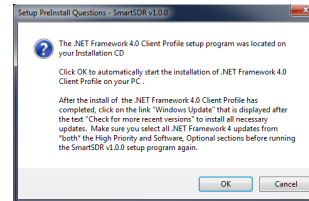
If you are installing SmartSDR for Windows from the CD, place it in your CD drive and close the drive door. The SmartSDR software installer will automatically begin. If you are installing SmartSDR for Windows from the installer downloaded from the Internet, double click on the SmartSDR installer (SmartSDR\_v1.x.x\_Installer.exe) to begin.

### Step 1. Pre-Installation Tasks

The first thing the SmartSDR software installer will do is determine if your PC's operating system and installed .NET version meets the minimum requirements. If your PC does not have the required .NET Framework 4.0 Client Profile software loaded, the following Setup Pre-Install screen will be displayed.

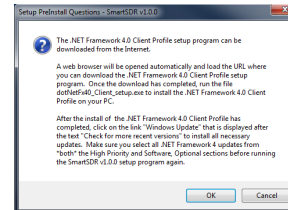


If you see this screen, click **YES** to install the *.NET Framework 4.0 Client Profile* software or click on **NO** to stop installing SmartSDR for Windows. If you are installing from the SmartSDR for Windows CD, and selected **YES**, the following screen will be displayed.



Click **OK** to begin the .NET Framework 4.0 Client Profile software install or click on **CANCEL** to stop installing SmartSDR for Windows.

If you choose not to install SmartSDR for Windows in order to install the .NET Framework 4.0 Client Profile, the following screen will be displayed.



Click on **OK** to open a web browser and download the .NET Framework 4.0 Client Profile software from the Internet or click on **CANCEL** to stop installing SmartSDR for Windows.

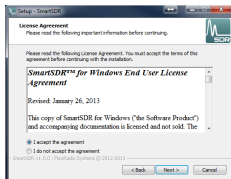
## Step 2. Installing SmartSDR for Windows

The first screen displayed is the Welcome to the SmartSDR Setup Wizard as shown below.



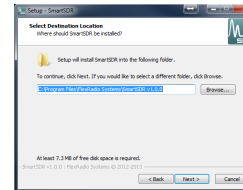
Click **NEXT** to continue.

The SmartSDR for Windows End User's License Agreement screen is displayed as shown below.

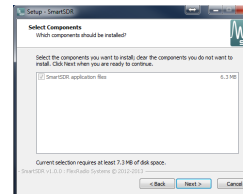


To accept the license agreement, click on the **"I accept the agreement"** radio button and then click **NEXT**.

The Select Destination Location Screen is displayed as shown below. It is recommended that you use the default installation location, as it will use the Windows recommended location for the application files depending on if you have a 32 or 64-bit operating system. You may however choose an alternate location.

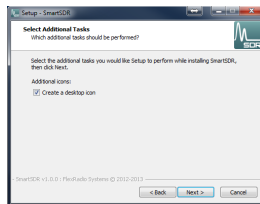


Once you have decided on the installation location for SmartSDR for Windows, click **NEXT** to continue. The Select Components screen is displayed as shown below.



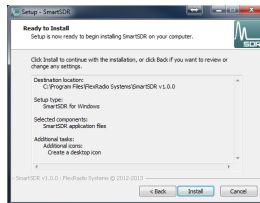
Click **NEXT** to continue.

The Select Additional Tasks screen is displayed as shown below. It is recommended that you leave the "Create a desktop icon" option checked to provide a convenient way of starting SmartSDR for Windows from your Windows Desktop.



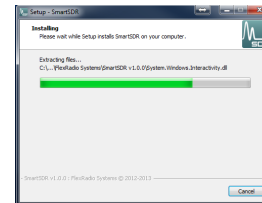
Click **NEXT** to continue.

The Ready to Install screen is displayed as shown below.

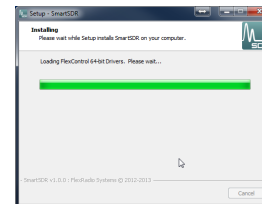


Click **NEXT** to continue.

The Installing screen will be displayed showing the files being loaded.



After the Files have been installed, the FlexControl™ driver will be installed as shown below.

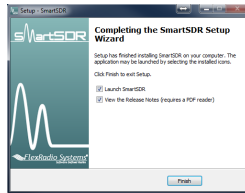


After a few moments, the Completing the SmartSDR Setup Wizard screen will be displayed as shown below. It is recommended that you review the SmartSDR for Windows release notes as they contain important information regarding the features and operation for this specific release of SmartSDR. Check the "View the Release Notes (requires a

PDF reader)" option to display the SmartSDR for Windows Release Notes after SmartSDR installer has completed the software install.

If you want to start the SmartSDR for Windows application after the SmartSDR installer has completed, leave the "**Launch SmartSDR**" option checked.

Click **FINISH** when you have made your selections.



### Step 3. Starting the SmartSDR for Windows Application for the First Time

Turn on the 13.8 VDC power supply that is connected to the FLEX-6000 Signature Series SDR.

Power on the FLEX-6000 by pressing the power button. The LED display will initially show the text "Calibrating...". Once the FLEX-6000 is ready, it will display the radio model name and the Power button LED will be illuminated green.

Locate the SmartSDR application icon on the desktop as shown below and double click on it to start SmartSDR for Windows.

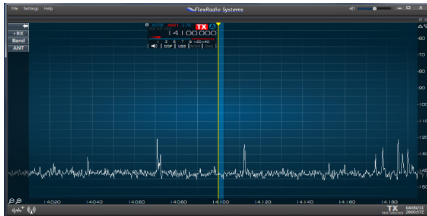


The SmartSDR Radio Setup screen will be displayed. Click on your FLEX-6000 Signature Series SDR displayed on the left hand side to select and then click on the **Connect** button as shown below.



#### Step 4. Operating Your FLEX-6000 Transceiver

The SmartSDR console will be displayed with one (1) High Definition Panadapter Spectrum Display and one Slice Receiver tuned to 14.100.000 MHz as shown below.

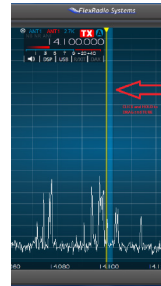


To TUNE the receive slice to another frequency:

1.) Click the **BAND** button on the left side of the panadapter then click the desired BAND.



2.) (PAN-EDGE-TUNE) Hover your mouse over the blue bar in the panadapter window. Using the left mouse button, click and hold the button while dragging the slice to the desired frequency. Note that as you approach the edge of the displayed panadapter, it will begin to PAN so you can see the desired frequency segment.



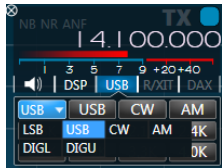
3.) (DIRECT FREQUENCY INPUT) Hover your mouse over the Frequency numbers in the Slice Panel. Click once with the left mouse button to highlight the frequency. Type in the desired frequency and press **ENTER**. Note that you can enter frequency in kHz or MHz directly. If the entered frequency is beyond the displayed panadapter screen an OFF-SCREEN indicator will be displayed on the panadapter display. Simply double-click on the indicator to re-center the panadapter to your desired frequency.



To set the operating MODE:

1.) On the slice receive control panel, left click current **MODE** (USB, LSB, CW, AM, FM, DIGU, DIGL).

2.) Left Click the left-most MODE and select your desired active MODE. Note that you can select and display 3 additional favorite MODES. Just right-click the displayed MODE and choose your favorite.



To Transmit:

1.) Click the **TRANSMIT** icon at the lower left of the SmartSDR main screen to activate the TRANSMIT control panel.



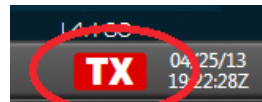
2.) Adjust the RF Power slider control for the desired output. The range is 0 to 100 watts.

3.) Adjust the MIC slider control for the desired microphone level. Start with the slider in the center and adjust as needed.

4.) For additional DX talk power, click the COMP button and adjust the compression slider for desired level.



5.) Press the PTT switch on the microphone and speak in a normal voice. The PTT indicator in the lower right corner of the SmartSDR console will turn red to indicate transmit. The front panel LED on the FLEX-6000 will also illuminate red.



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Congratulations! Your FLEX-6000 Signature Series SDR should be operational and receiving signals. Please refer to the FLEX-6000 Signature Series Hardware Manual and SmartSDR Software Manual, which are available for this radio, for instructions and additional information regarding the operation of your FLEX-6000 Signature Series SDR.

**NOTES:**

"CE" marked devices meet the essential requirements of Directive 1999/5/EC



The exclamation point warning symbol means that the system is to be operated in a non-harmonized frequency band and/or according to the laws of the telecommunications authority in the country of use.

Please ensure that you have acquired the device for the use land approved operation, and that the respective national frequency allocations are respected. See also the warning on page 3 of this guide.

#### **Waste Disposal**

The device may not be disposed of with household waste! This device complies with EU Directive on Electronic and electrical equipment (WEEE regulation) and will therefore not be disposed of with household waste. Dispose of the device at your local collection points for electronic equipment!



 European Union Declaration of Conformity

FLEX-6000 Amateur Radio Transceiver Series (FLEX-6500 / FLEX-6700 / FLEX-6700R)

According to Radio and Telecommunications Terminal Equipment Directive, (R&TTE) 1999/5/EC - using the Standards:

EN 301 489-1 v1.8.1 (2008-04)  
EN 301 489-15 v1.2.1 (2002-08)  
EN 301 783-1 v1.2.1 (2009-07)  
EN 301 783-2 v1.2.1 (2010-07)  
EN 60950-1 : (2011)

Type of Equipment: Base Station  
Equipment Class: B

WE THE UNDERSIGNED HEREBY DECLARE THAT THE EQUIPMENT SPECIFIED ABOVE CONFORMS TO THE ABOVE STANDARDS.

FlexRadio Systems Date of Testing: April 24, 2013

FlexRadio Systems, 4616 W. Howard Lane, Ste. 1-150, Austin, Texas 78728 U.S.A.

Person Responsible: Gerald Youngblood (Signature on file)

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**FlexRadio Systems - U.S.A**

4616 W. Howard Lane, Ste. 1-150

Austin, TX 78728

U.S.A.

Phone: 512-535-4713 / Fax: 512-233-5143

Email: [sales@flexradio.com](mailto:sales@flexradio.com)

[support@flexradio.com](mailto:support@flexradio.com)

**FlexRadio Systems Representative for EU**

SDR-Funktechnik GmbH

Godeke-Michels-Weg 12

D-21762 Otterndorf

Germany

Phone: (+49) 4751 900501 / Fax: (+49) 4751 998569

Email: [FlexRadio-EU@t-online.de](mailto:FlexRadio-EU@t-online.de)

***[www.flexradio.com](http://www.flexradio.com)***