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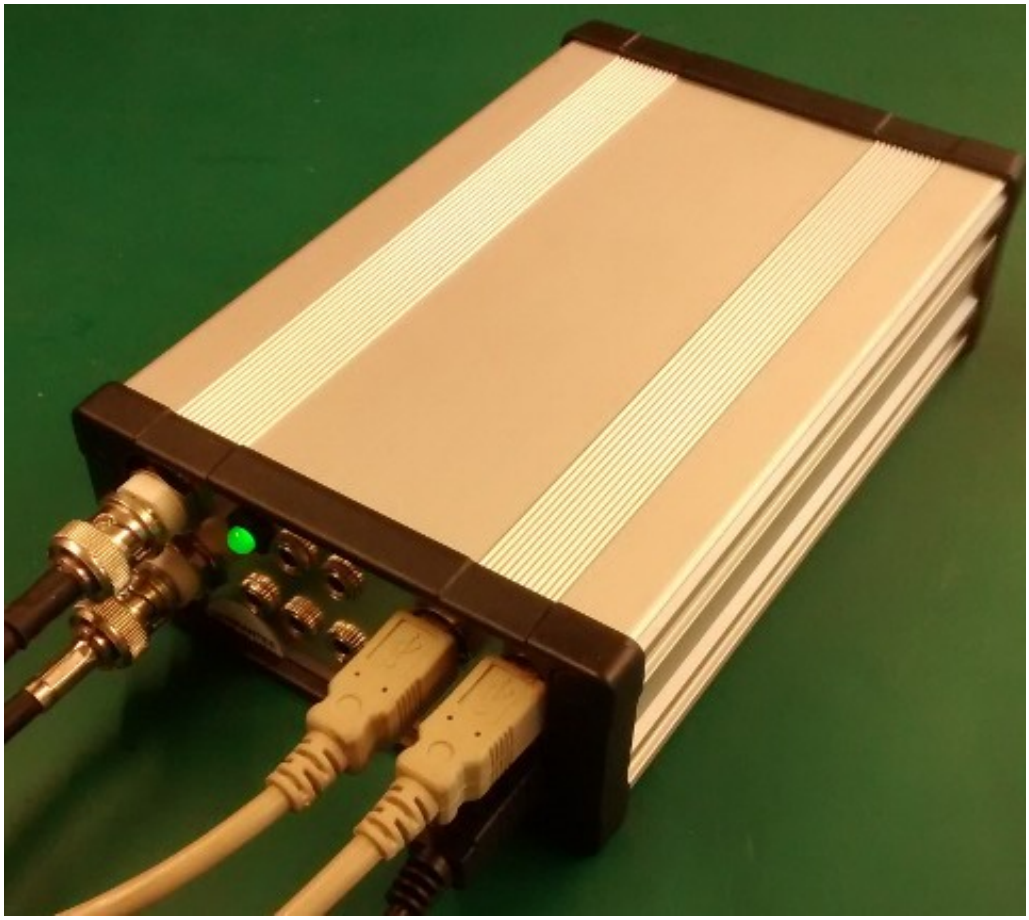

SDR-4++ Dual Diversity SDR Receiver

Operating Guide

version 1.0

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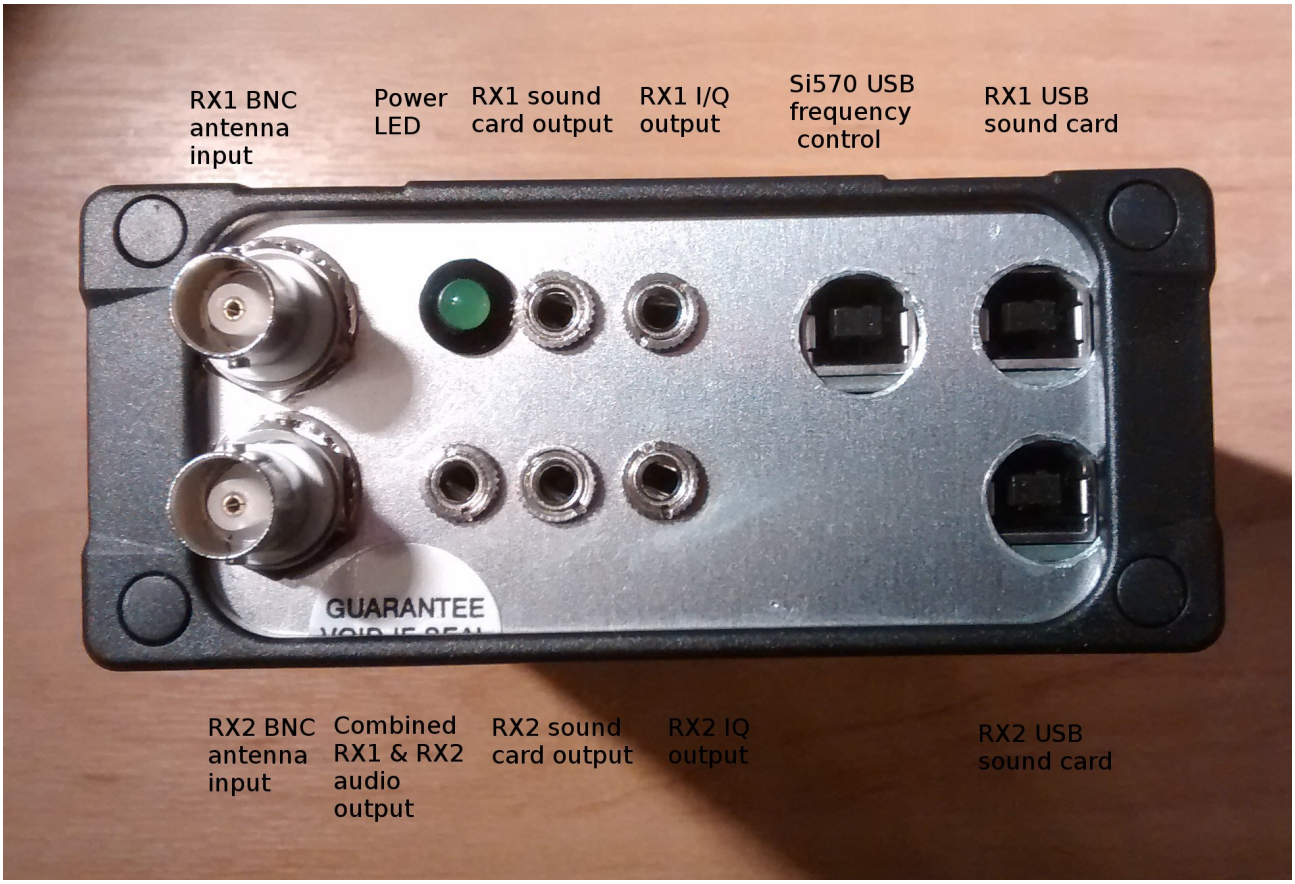
1 Safety feature

Important! One safety design feature of the SDR-4++ receiver is that when it or the PC is powered down all the bandpass relays are powered off shorting the bandpass filters to ground to provide extra isolation and protection to the PC. This can also happen when changing the SDR program.

After powering up the receiver or changing the SDR program the receiver starts up at a default frequency of 7.050 MHz. You can then select the required frequency of operation.



3 WARNING!

The SDR-4++ receiver has been carefully designed to meet CE and FCC specifications and also provide protection to your computer from static

electricity and electrical pulses. The receiver is designed to be powered only from the USB connection on the PC. If the receiver is modified by the user this voids the CE and FCC certifications and may damage the receiver or user's PC.

No warranty claims will be accepted if the receiver case has been opened.

The receiver has been designed to isolate the antenna from the computer. Connection to the antenna should be made only via the BNC connector. External antenna earths or grounds should only be connected to the shield of the BNC connector.

The receiver case is connected to the computer ground and should be isolated from any external antenna connection.

As well as protecting the computer this also reduces common mode RF noise from the computer or mains earth from reaching the antenna.

4 Where are the set up files?

On the CD disc included with the SDR4+ is a folder “CCW SDR4 general coverage SDR”. If you can't use the CD the following link to the CloudMe folder on the internet contains these files:

https://my.cloudme.com/#g4hyg/Cross_Country_Wireless_CD

Download the files you need individually, trying to download entire folders doesn’t always work.

5 Before installing the software and driver

Before starting driver installation remove any external USB hubs from the computer and connect the USB cables from the SDR-4+ receiver directly to the computer USB ports when directed during driver installation. Failure to do this may result in the driver installation being rejected.

Install all SDR programs and drivers in Administrator mode. Failure to do so may result in incorrect installation of the frequency control drivers.

6 How do I install the drivers?

In the “CCW SDR4 general coverage SDR” folder is a program PE0FKOUSB-Driver_installer.
This program installs the driver and the Amateur Radio Root Certificate to confirm the driver.
Inside the folder “CCW SDR4+ setup program v1.04” is a program that saves the receiver drivers in a folder C:/SDR4+ on the target PC and places the ExtIO_Si570.dll file in the HDSDR folder so that the HDSDR program can control the frequency of the receiver.
Inside the folder is another program “Install_CFGSR_V2.6.msi”. Install this program to ensure that drivers are correctly installed on Windows 8 and 10.

7 Where do I get the HDSDR program?

The latest version of the HDSDR program is included on the CD disc “HDSDR_install.exe”. The latest version can be downloaded from the HDSDR website:
http://www.hdsdr.de/

8 Is there a manual for the HDSDR program?

HDSDR is based on the earlier WinRad program. A guide to WinRad is included on the disc,
“WinRad_UG_1.32.pdf

9 How do I get HDSDR to tune above 40 MHz?

When you have HDSDR running with the receiver select the ExtIO button to the right of the Tune frequency display. This will open another program that is used to control the receiver frequency.
Select the Si570 tab. This will open a page showing some details of the Si570. At the top right is "Freq range". In the right hand window change the default setting to 300.
Click the "Hide" button.

Exit HDSDR to save the changes.
When you restart HDSDR you will be able to tune up to 70.5 MHz with the SDR4+ receiver.

10 Setting up the RX Input Calibration in HDSDR

Open HDSDR.
Click “Options [F7]”.
Click on “Input Channel Calibration for RX”.
On the receiver test sheet are the results of measurements taken during receiver commissioning. Move the sliders so that the Amplitude and Phase values match the values noted on the test sheet.
Click OK.

11 Setting HDSDR for zero IF operation

Setting HDSDR for zero IF operation allows easy tuning of two HDSDR sessions without having to set frequency offsets each time.

Open HDSDR.
Click “Options [F7]”.
Click on “Misc Options”.
Click on “set LO ←→ Tune Offset”.
Enter 0 as the new offset.
Click OK.

Click “Options [F7]”.
Click on “Misc Options”.
Click on “Tune fixed to ‘LO ←→ Tune Offset”.

12 Setting up two HDSDR sessions with the SDR-4++ dual receiver

Open the first HDSDR session.
Click on “Soundcard [F5]”.
In “RX Input (from Radio)” select the USB Audio CODEC for RX1
In “RX Output (to Speaker)” select the corresponding USB Audio CODEC.
Click “OK”

Click “Start”.
The receiver should start operating. Left and right clicks on the numbers in the LO display will change the receiver frequency. Clicks on the waterfall allow fine tuning. Click on where the carrier should be on a SSB signal to bring it to the centre of the display.

Headphone level audio will be present at the RX1 sound card output socket and one side of the Combined RX1 & RX2 audio output socket.

When RX1 is working open a second session of HDSDR.
Open the first HDSDR session.
Click on “Soundcard [F5]”.
In “RX Input (from Radio)” select the USB Audio CODEC for RX2
In “RX Output (to Speaker)” select the corresponding USB Audio CODEC.
Click “OK”
Click “Start”.

Set the Volume and AGC Threshold to the same levels on both HDSDR sessions.

Headphone level audio will be present at the RX1 and RX2 sound card output socket and both sides of the Combined RX1 & RX2 audio output socket.

At this stage it is advisable to arrange the RX2 HDSDR session so that it is behind the RX1 HDSDR session so that both waterfall displays are visible.

Frequency changes can only be made with the RX1 HDSDR session.

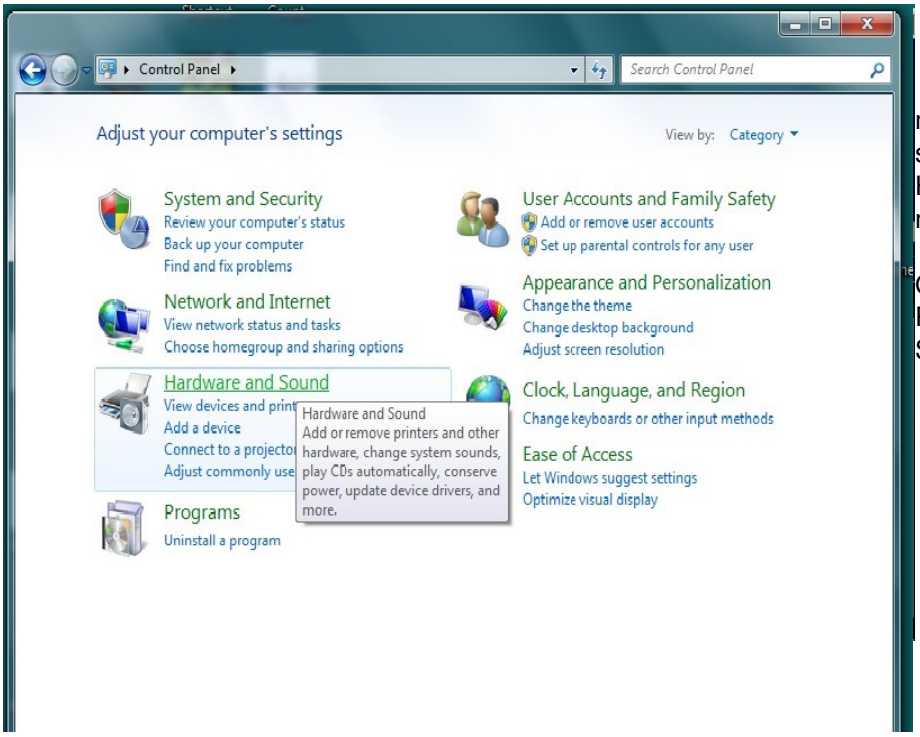
Mode changes will have to be made to both receivers. It is possible to set up different sidebands on each receiver on both LSB/USB and ECSS.

13 HDSDR S meter calibration

Open HDSDR.
Click “Options [F7]”.
Click on “Misc Options”.
Click on “S-Meter calibration”.

Feed a calibrated signal generator into the required receiver BNC socket. Follow the instructions on the HDSDR S-meter calibration window to set the S meter level. This also adjusts the dBm level on the Spectrum display so an alternative is to set the Spectrum display for the signal generator dBm level.

14 Possible problems with Windows 7 and Vista sound card set-up



Windows Vista and Windows 7 may need the sound card settings correcting if the HDSDR display looks like a mirror image about the centre.

Open the Windows Control Panel and select Hardware and Sound.

In Sound select Manage Audio Devices

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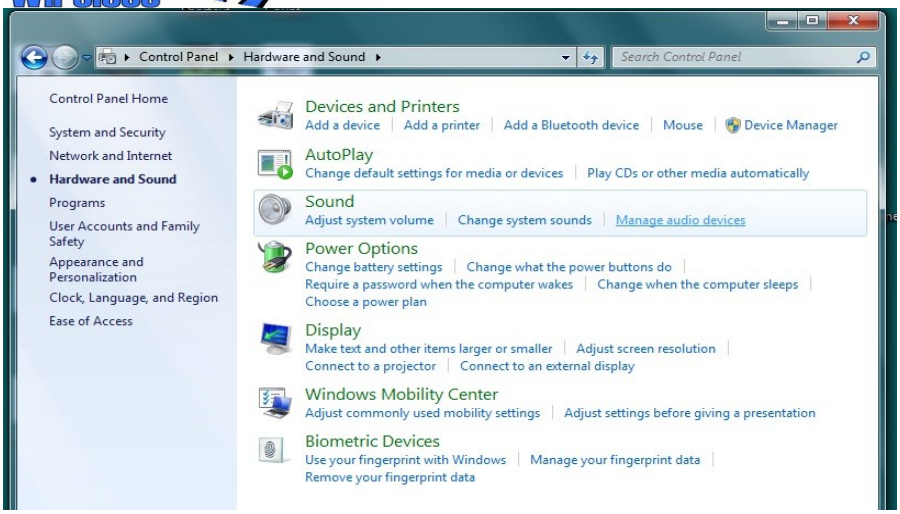
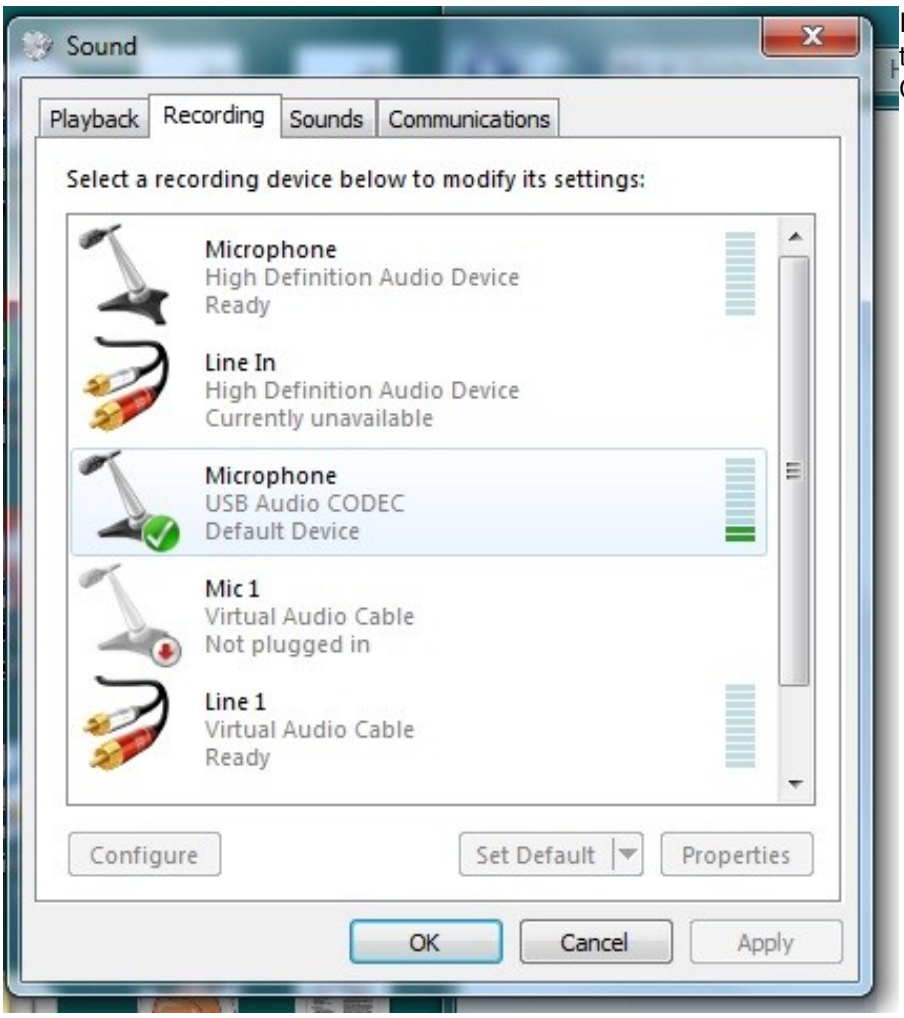
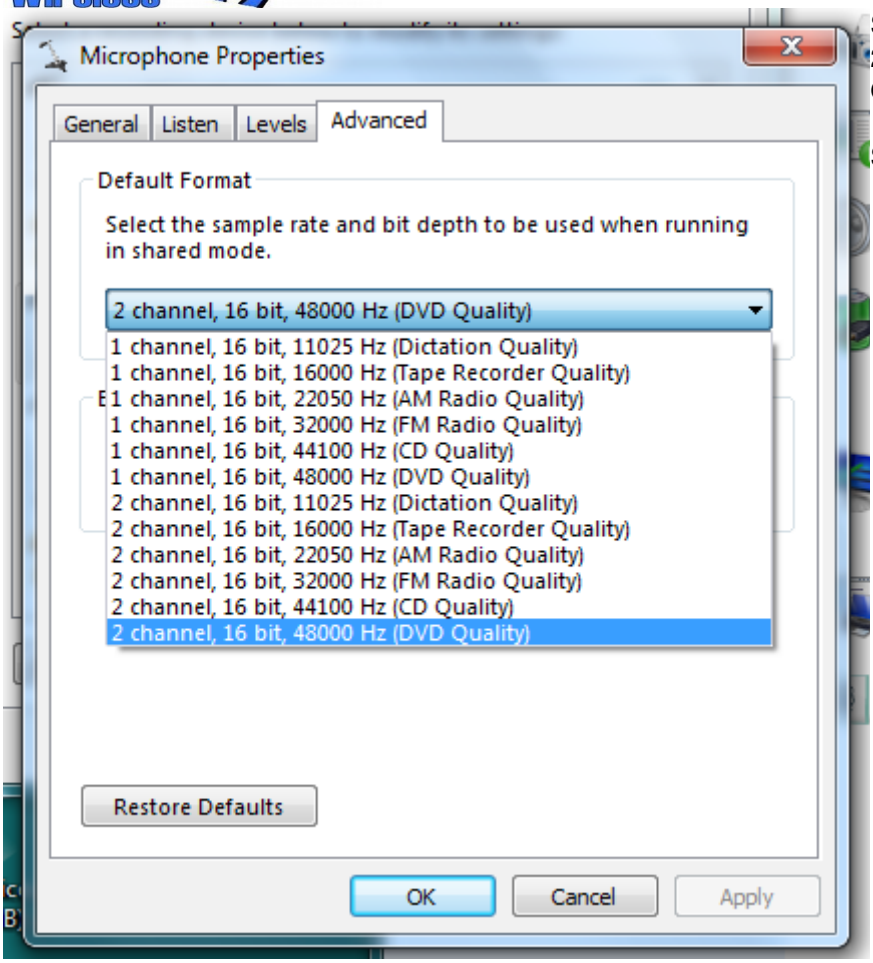




In Sound select the Recording tab then select the USB Audio Codec.



Select the Advanced tab and select 2 channel, 16 bit, 48000 Hz (DVD Quality).

Select OK to confirm any changes.