UC-1374-531R Antenna Kit

The UC-1374-531R Antenna kit is a low cost but highly effective kit capable of receiving and displaying weather satellite imagery with a few relatively simple steps. Although much of the design capabilities are focused on the 137MHz range, the antenna is versatile in a wide rage of frequencies including many in the FM range. So, go ahead and enjoy some excellent FM radio programming as well.

WHAT'S INCLUDED IN THE KIT

- UC-1374-531R Antenna (with convenient side mounted N-Female connector)
- SDRSharp dongle (with SMA female connector)
- 25ft custom co-axial cable with SMA Female and N Female connectors [optional]

SYSTEM CONFIG OVERVIEW

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      /\
     /  \                    ┌──────────────┐                          Ethernet      ╭────────╮
    / /\ \      Co-ax        │  SDR Sharp   │      USB     [PC]        or Wi-Fi  ←   │ Internet │
   /_/  \_\  ───────────→    │   Dongle     │  ──────────→            (Not            ╰────────╯
      ||                     └──────────────┘                         included)
      ||
   UC-1374                                              Windows PC
   Antenna                                               with USB
                                                       (not included)
```
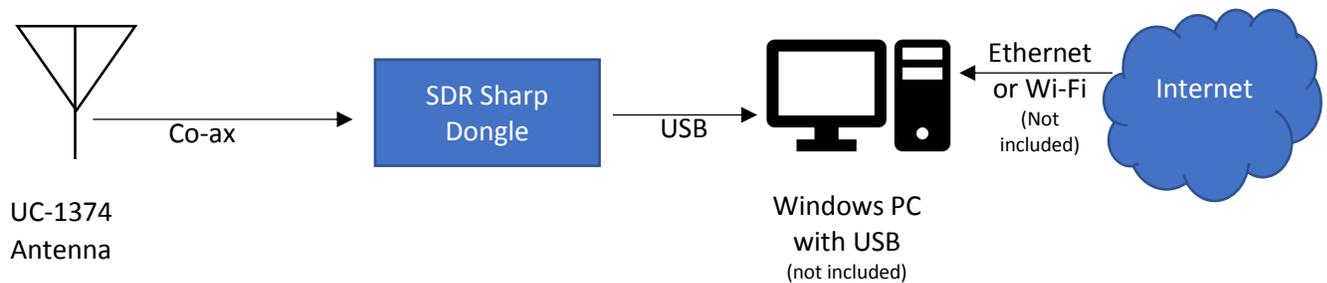
SETUP INSTRUCTIONS (for systems newer than Windows XP)

This instruction is for Windows PC environment (preferably Win10 or better) setup. The components included in the kit are compatible with most popular configurations of Hardware/OS environments such as Linux, Debian/Raspberry Pi, Oriod systems running on intel, AMD or ARM hardware. We will only cover Windows environment on intel/AMD for this instruction sheet. Feel free to explore the system of your choice.

NOTE:

> **An internet connection is required to complete the initial software downloads and to track the satellite live for recording.
> **The software programs described here in, are not compatible with Windows XP.

SOFTWARE (Free downloads)

Three primary pieces of software are required to make your project successful. Each software listed below is provided by independent sources therefore download availability maybe dependent on that provider's discretion. There we make no promises of availability and you may need to make other choices in software.

- REQUIRED: SDRSharp (to capture satellite transmission via SDR dongle)
- CHOICE: Orbitron 3.71 our choice of free option for satellite tracking/prediction – others available
- CHOICE: WXtoimg our choice of free option for recording and decoding images received from satellite

Ensure you have a windows PC (not included) with admin access privileges and available USB port ready; to receive and process the signal captured.

1. **INSTALL THE UC1374-531R ANTENNA**
   o Select an appropriate physical location to mount your antenna. As best as possible the highest point that is safe but also unobstructed by other physical structure such as large trees or building(s). Keep in mind:
     ▪ the antenna must be installed within range of length of the connecting co-ax cable between the antenna and your PC.
     ▪ The antenna will begin to receive signal as soon as the satellite begins to approach until is has passed your location. Therefore consider the overhead range of reception needed for longest recording path of the satellite as it passes.
   o Secure the antenna vertically pointing upwards with the base firmly mounted. An undamaged antenna will resist the outdoor elements to endure several years of continuous use.
   o Connect the N Female end of the co-ax to the antenna base and route the co-ax cable towards your PC.

   SETUP THE SDR Dongle & SDRsharp software:
   - ***The SDR dongle and software are not compatible with Windows XP***. For systems older than Win10 you may need to install at least Microsoft.NET4.6 Redistributable (see trouble shooting)
   - Connect the SMA female end of the co-ax to the dongle and set it aside until later. DO NOT PLUG IN THE DONGLE JUST YET.
   - First, download the SDR software, DO NOT PLUG IN THE DONGLE TO THE PC UNTIL LATER
   - Go to www.airspy.com/download
   - Click 'download' next to Windows SDR Software Package (SDRSharp x86.zip)
   - If prompted, save the Zip file to your downloads folder. (DO NOT save to the Program Files Directory)
   - Using Winzip, Windows native unzip or similar utility, extract SDRSharp x86.Zip completely (DO NOT attempt to run the program from within the compressed zip file)
   - NOW, PLUG IN THE SDR Dongle - Upon successful unzip, plug in the SDRSharp dongle to an available USB port on your PC.
   - Inside the folder of unzipped files locate the file 'install-rtlsdr.bat', right-click and select 'run as Administrator' (note if your file system does not show file extensions you will see 'install-rtlsdr')

   - The Windows shell command screen (often black) will popup briefly and exit automatically when this step is complete.
   - Now, locate the file Zadig.exe, right-click and select 'Run as Administrator' (or 'Zadig' if "show file extensions" is not enabled in your file explorer). You may need to accept a prompt asking to allow changes to your computer.

- The popup window should look similar to the figure below, select Options (1) and ensure 'List All Devices' is selected
- Select (2) 'Bulk-in, Interface (Interface 0)' – on some systems it may read RTL2838UHIDIR or RTL2838U
- Use the up/down arrows to select (3) WinUSB as Driver
- Click down arrow (4) to ensure 'Install Driver' (5) is selected
- Click 'Reinstall Driver' button and the installation will begin (You may be prompted that 'Windows can't verify this certificate' select 'install driver anyway' to continue.)
- You will be prompted 'Successful Installation' upon completion.
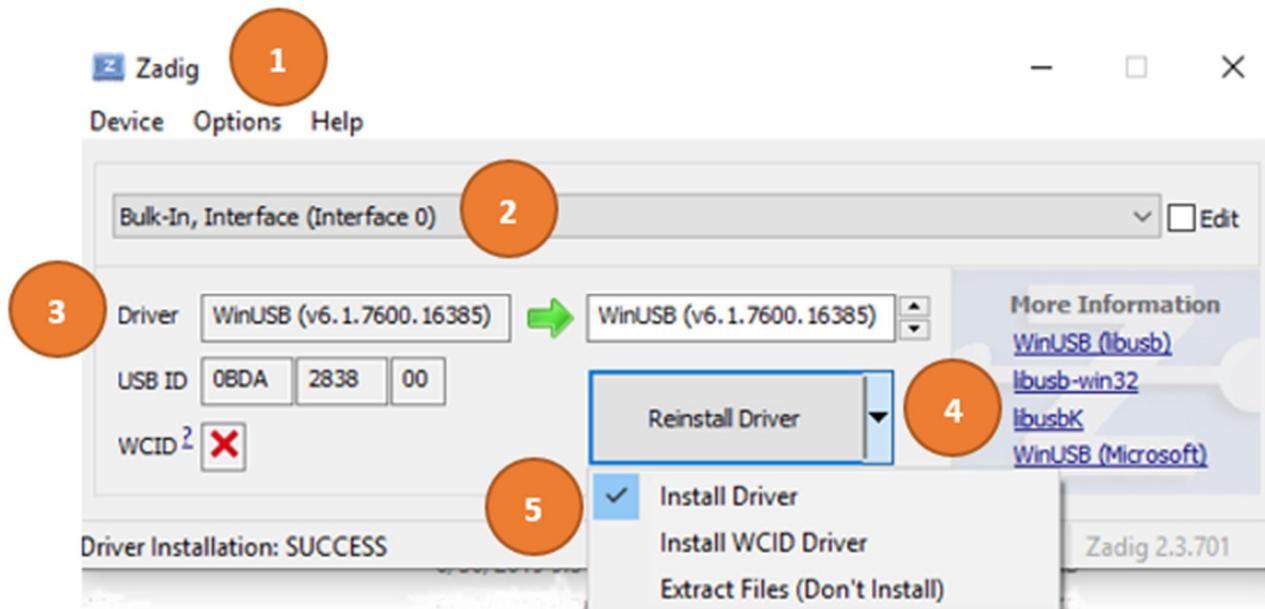
- From your unzipped files folder right-click 'SDRSharp.exe' select 'Run as Administrator' and this will start the software to receive signal via the SDR Dongle
- Set the source drop-down box to 'RTL-SDR(USB)' as shown below:
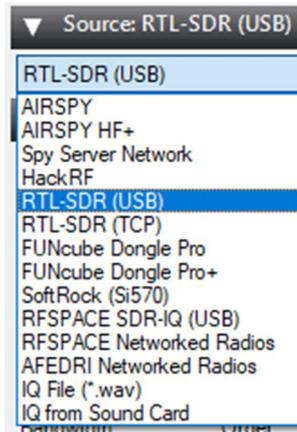
- Press the play button (top left) and you should now be able to tune frequencies (type or click the frequency desired. (note that the gain is zero by default, so you will need to increase to see and hear stronger signal)

SATELLITE TRACKING – ORBITRON

Our chosen software for tracking the desired satellite is ORBITRON. There are several other options available online that you may also choose from. We chose orbitron because of the guidance available from their website.

To setup, go to http://www.stoff.pl/

- Click 'downloads' then select 'Orbitron 3.71 Installer, size: 2 MB'
- The filename 'orbitron.exe' will get downloaded which you can install by following the prompts (you may be asked to allow the program to run, click yes)
- Orbitron will install and prompt to update the TLE
- Upon completion, you may select the desired satellite to track from the right pane.
- You will find plenty of help from the orbitron website and from the help section on the lower screen main tab.

WXtoimg - CONVERTING SIGNALS RECORDED TO USEFUL IMAGES

One option to interpret the signal data recorded when the satellite passes by is to convert the data to images using **WXtoimg software**.

- Go to https://www.wraase.de/wxtoimg/
- Under downloads heading, select 'Windows' to download the installation file for Windows systems.
- Run the downloaded file and follow the Windows prompts to complete the installation and open the program.
- Once the satellite passes and you close orbitron tracker the WXtoimg program will automatically begin to decode the recorded signal to show the map with overlays.

FAQ

- Will this kit harm my PC?
    - This is unlikely since it uses a familiar USB connection to your PC.
- What if my PC slows down after installing the antenna kit?
    - The software and dongle are only active while in use. Your Pc should resume normal speed after closing programs. You may consider having at least 4GB RAM (8GB is much better).
- Will the SDRSharp dongle work with older USB ports?
    - Yes, the dongle is compatible with older ports (be mindful the kit is not suited for WinXP)
- Does the antenna need to be plugged into a power source?
    - No, the antenna is self-powered.
- Where do I install my antenna?
    - Preferably on a flat surface at the highest and unobstructed point of view to the open sky.

- How do I safely remove the SDR dongle from my PC?
  - o You may eject the USB function before you unplug the USB from your PC
- What the satellite signal is too weak at my location?
  - o Our custom UC-1374-531R antenna is uniquely manufactured with specialized signal filters and amplifiers to give you the best results.
- Will lightening damage my PC while connected to the antenna?
  - o Answer here
- The USB dongle gets very warm during use, is that normal?
  - o Answer here

TROUBLESHOOT

- My Windows PC did not recognize my SDRsharp dongle plugged in via USB
  - o Go to www.airspy.com/downloads scroll down and click to download and install the 'WinUSB Compatibility' driver. When complete begin from step 1 above.
- The signal drops suddenly low while the satellite cone of reception is directly overhead
  - o Check that there is nothing blocking the signal to the antenna. For example, a tall building nearby can block reception.
- I installed the downloaded file but nothing happened
  - o Ensure you have admin privileges on your PC and retry the installation.
- The parameters in Zadig.exe screen are blank
  - o Ensure your PC has correctly recognized the USB dongle when plugged in.
- My SDRSharp installation fails or directs me to install Microsoft.NET Redistributable
  - o Go to https://support.microsoft.com/en-us/help/3151800/the-net-framework-4-6-2-offline-installer-for-windows to download and install.
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