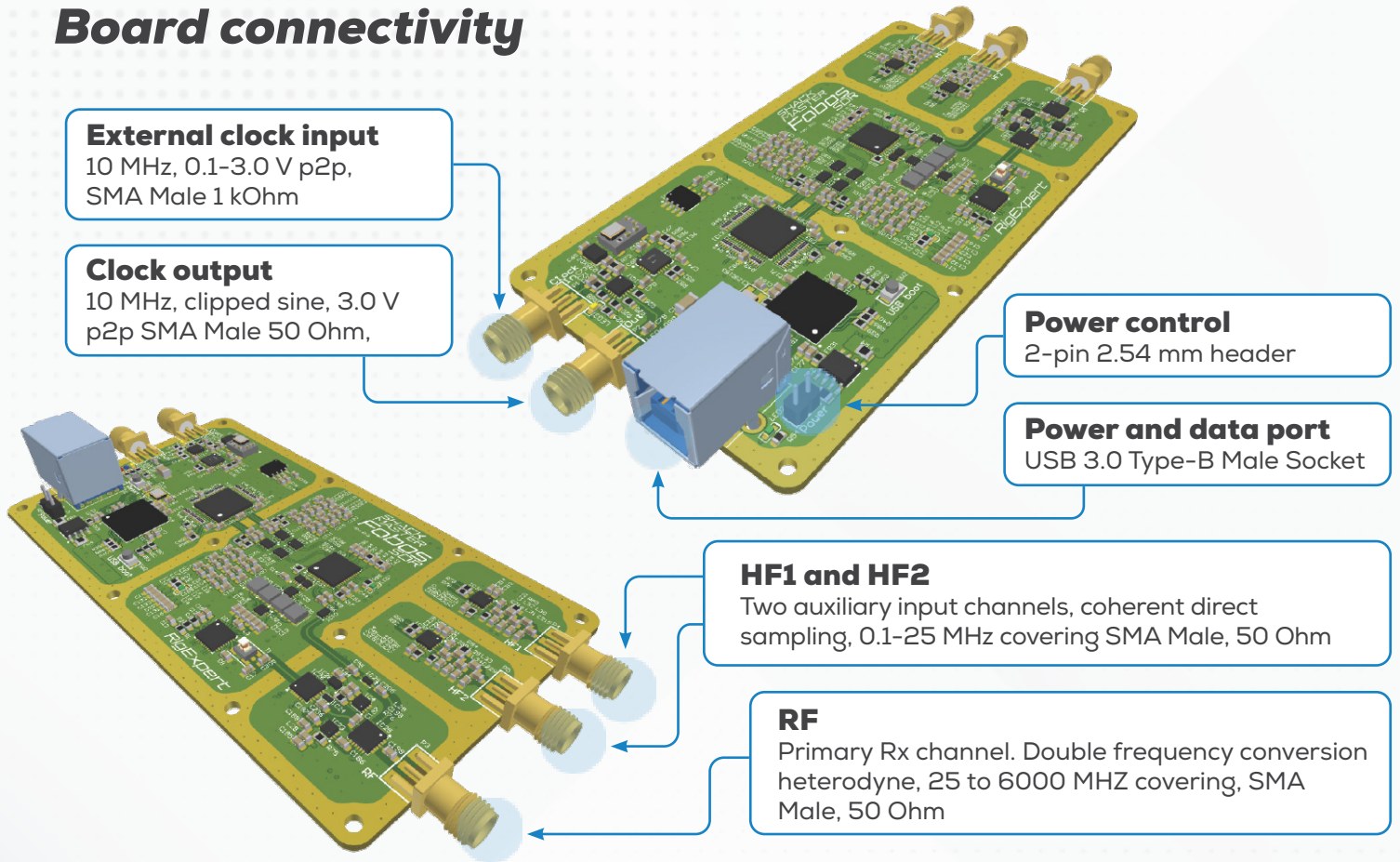


# Fobos SDR User Guide

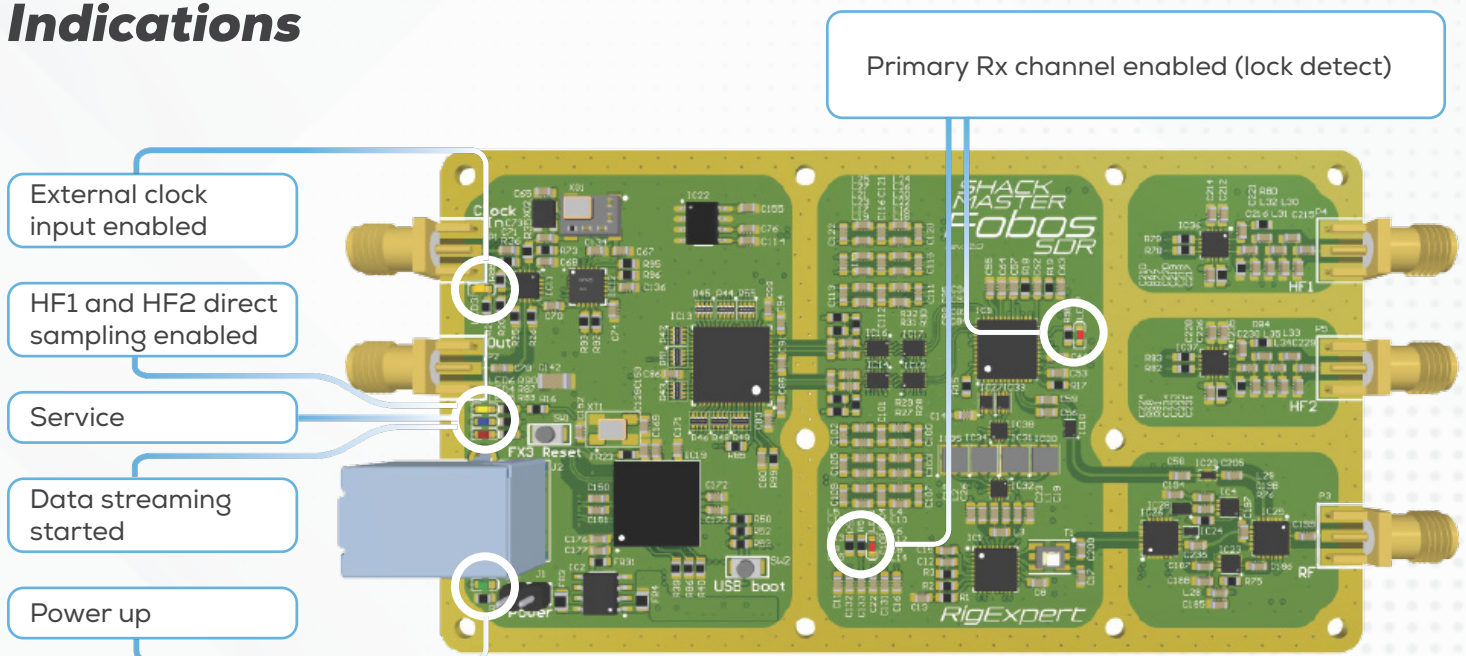
RigExpert® Fobos is high-performance general purpose Software Defined Radio (SDR) acquisition board with super speed USB 3.0 interface.

It has continuous 100 kHz to 6GHz operating frequency range and up to 50 MHz bandwidth with true 14-bit waveform sampling resolution and full data integrity.

## Board connectivity



## Indications

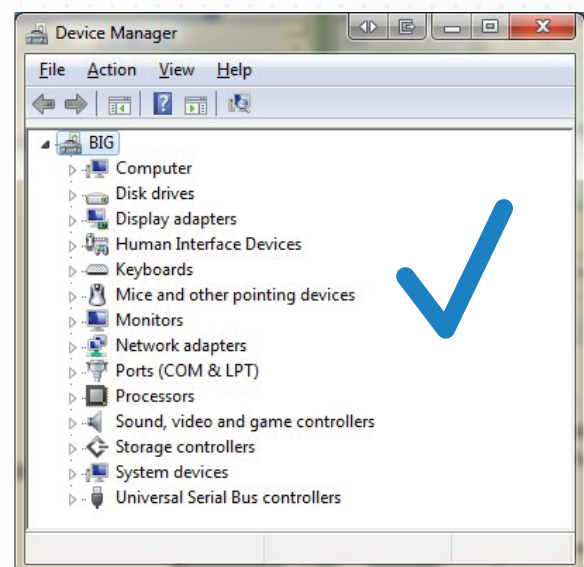
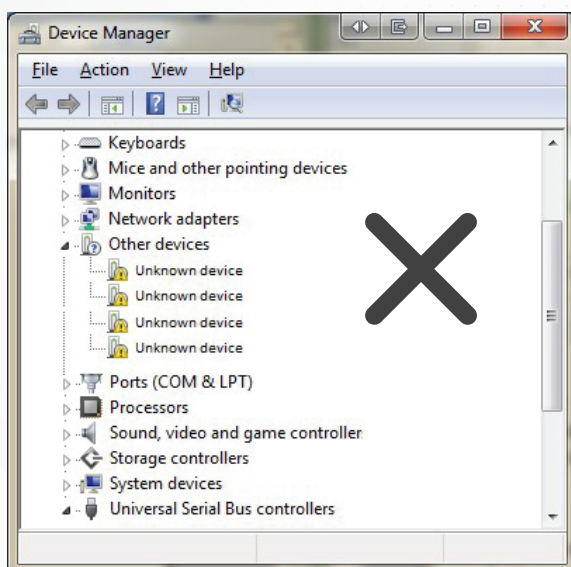


# Hardware setup

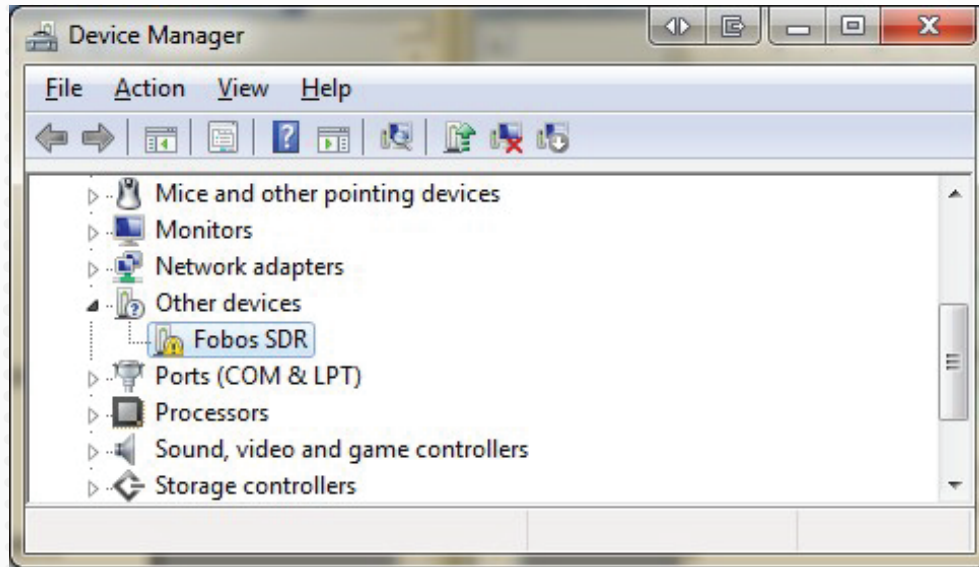
1. Connect VHF and /or UHF antenna to the **RF** connector to receive 25 to 6000 MHZ frequency range.
2. Connect HF antennas to **HF1** and/or **HF2** connectors to receive 0.1-25 MHz frequency range. For diversity receiving option two different antennas have to be connected to both HF inputs.
  - ! You can use either RF or HF1(2) channels, but you cannot use both channels simultaneously.
3. Connect USB-3.0 **power and data** port to USB-3.0 port on your PC.
  - ! Please only use USB-3.0 ports. The USB-2.0 operation mode is not supported.
  - ! Please use brand quality shielded USB-3.0 data cable to provide proper control and data streaming at maximum sample rates.
  - ! Connect USB cable directly to the root hub of your PC, do not use any splitters, converters, docking stations or extension cables.
  - ! Try to avoid connection to front panel USB sockets on your desktop, use rear panel sockets located directly on a motherboard.
  - ! Please disconnect all power-consuming devices connected to the USB ports (such as USB hard drives, charging mobile phones, desktop LED lamps, and other SDR devices). You can reconnect them after the Fobos SDR hardware and driver setup is complete.
4. Put a jumper on the **power control** connector.
5. (Optional) Connect external clock source and use the board clock out to operate in very high precision and synchronous clock domains. RigExpert® Fobos SDR has on-board stable internal clock source suitable for most user cases.
6. Disconnect the device and jump to driver setup section.

# Driver installation

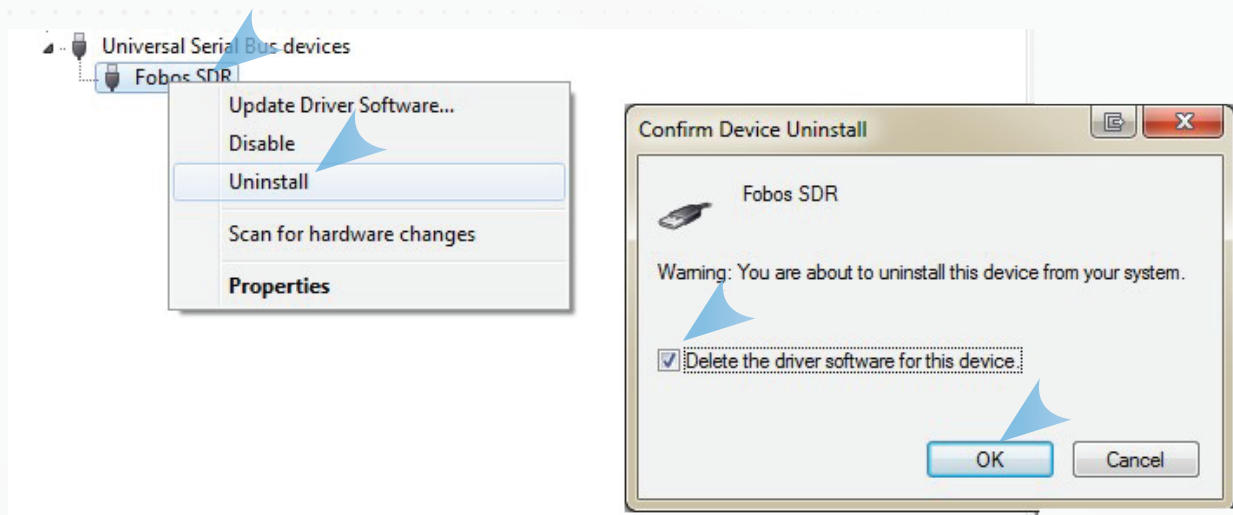
1. Make sure that proper drivers for your motherboard USB-3.0 root hub controller are installed.
2. Please open the device manager and ensure that there are no unknown devices or conflicted drivers in your system.



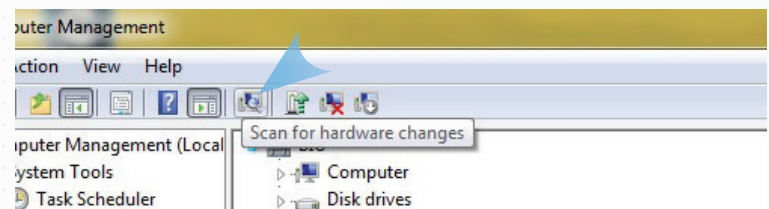
3. Connect RigExpert® Fobos SDR to USB port, wait a second for device to boot up, make sure that new unknown device named Fobos SDR appeared in device manager tree view.



! If your OS automatically installed some driver for Fobos SDR, uninstall it manually,



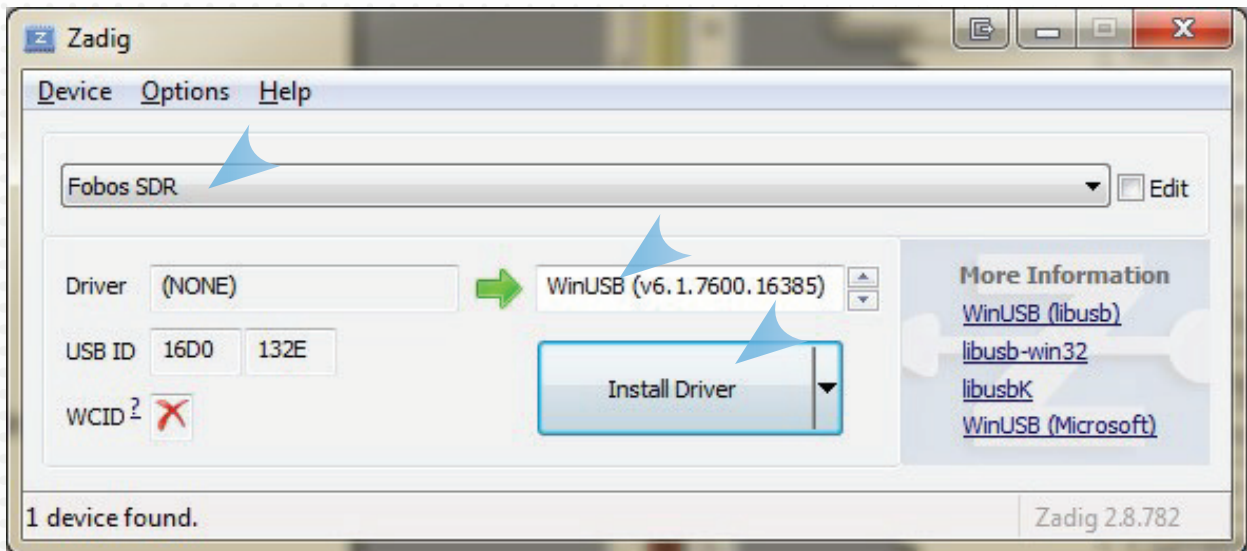
then replug the device or click "Scan for hardware changes" button



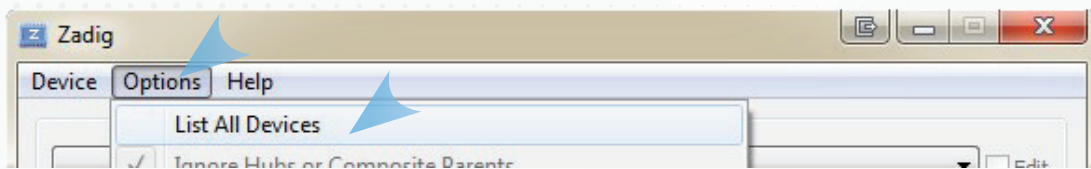
4. Open your favorite web browser and navigate to <https://zadig.akeo.ie> then download any version of **Zadig** executable - generic Windows USB driver installer.



5. Start **Zadig** executable (administrator permissions may be required), select **Fobos SDR** item in the drop-down list, ensure the item WinUSB(v.6xxxx) selected and hit **"Install Driver"** button

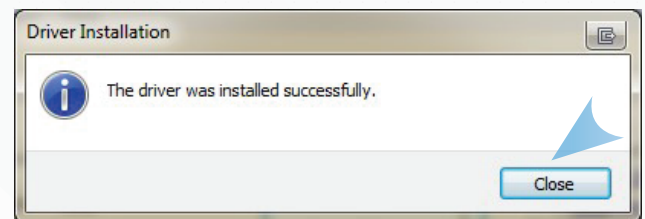


6. If your OS still installs its own driver - no problem, just select "List All Devices" in "Options" menu item,

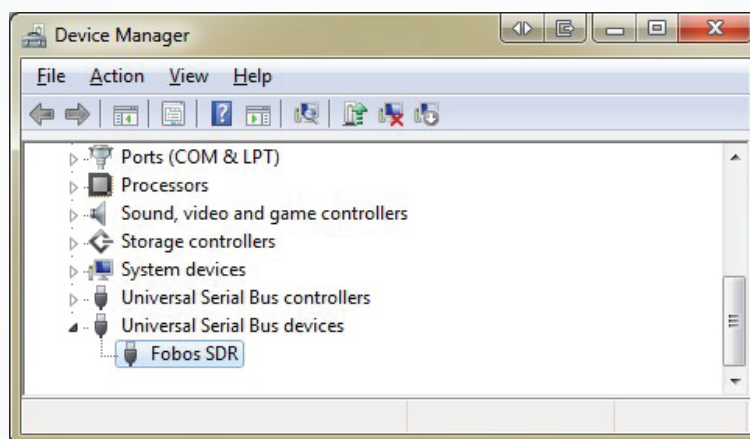


then select **Fobos SDR** item in the drop-down list and press this big button named **"Replace Driver"** or **"Reinstall Driver"**.

Finally press Ok in the message box appearing/



After successful driver installation your device manager should look something like this



If any issues or errors occur during driver setup, please double check the hardware setup and operating system configuration.

Otherwise jump to software installation and configuration section.

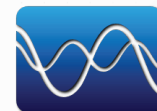
# Software installation and configuration

RigExpert® Fobos SDR is completely new product, thus supported software list is quite small. The most popular and convenient software to support the RigExpert® Fobos SDR are:

- SDR# via SDRSharp.FobosSDR.dll plugin.
- HDSDR and other ExtIO\_\*.dll compatible software via ExtIO\_FobosSDR.dll plugin.
- uSDR via native Fobos SDR API.

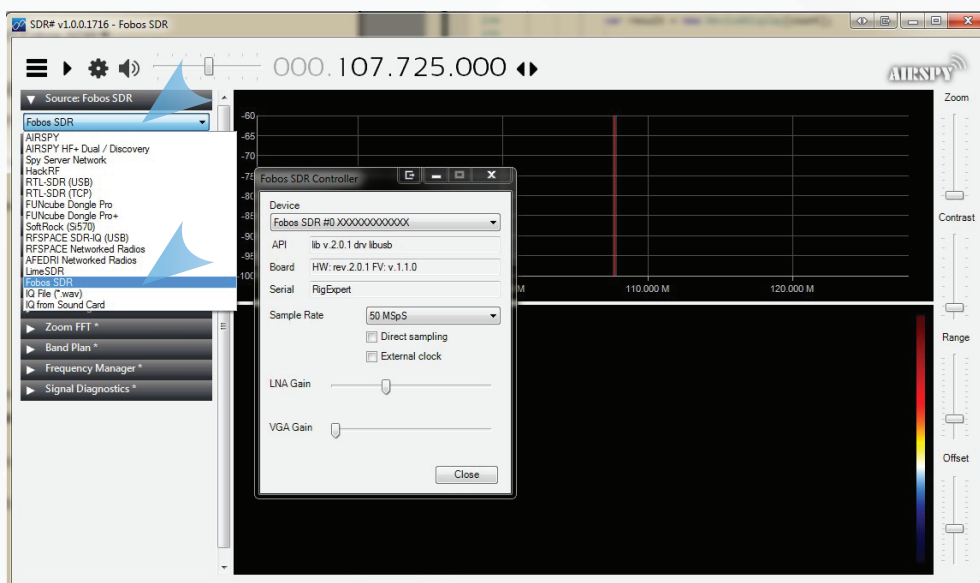
None pure installed of them except uSDR could not work with RigExpert® Fobos SDR. Compatibility is provided via specific plugins and configurations.

## SDR-Sharp installation and configuration. The Easy Way.



You can try and evaluate RigExpert® Fobos SDR with your favorite SDR# software without any boring installation and configuration procedures. Just follow a few easy steps:

0. Make sure you have .Net framework v.4.6 installed on your OS.  
Otherwise download it from Microsoft web site and install on your OS.
1. Visit <https://rigexpert.com/downloads/>  
and in **"Fobos SDR"** section download **"SDR# Fobos SDR pack"**. It contains portable version of SDR# software with all the stuff needed to connect and operate Fobos SDR.
2. Unpack downloaded zip archive to any directory.
3. Run **SDRSharp.exe**
4. Select Fobos SDR item in source drop down list.



5. Click gear button to configure specific parameters of Fobos SDR frontend.

6. Enjoy using RigExpert© Fobos SDR with SDR# software.

! If you are not so familiar with SDR# but still want to master it please visit <https://airspy.com/download/> and download **SDR# Big Book** - the greatest SDR# user guide ever.

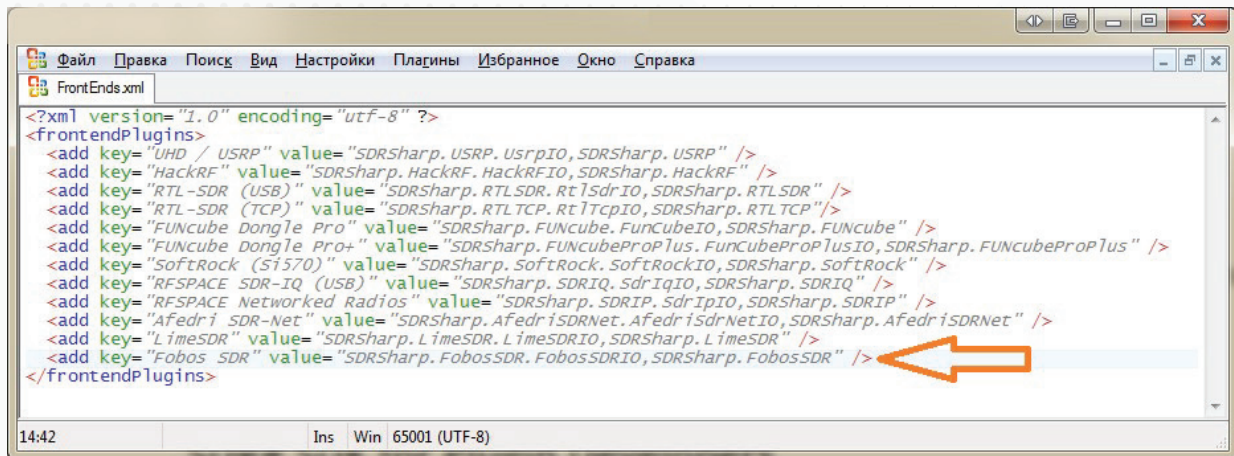
# SDR-Sharp configuration for Fobos SDR. Advanced.

If you're an experienced SDR (Software-Defined Radio) user and have already set up SDR# with your preferred plugins, frontends, and dependencies, you can manually install the **SDRSharp.FobosSDR** plugin into your existing system.

0. Make sure you have SDR# v.1.0.0.1716 with all dependencies installed.
1. Visit <https://rigexpert.com/downloads/> and in **"Fobos SDR"** section download **"SDR# Fobos SDR pack"**.
2. Unpack downloaded zip archive to any directory.
3. Copy **SDRSharp.FobosSDR.dll** and **fobos.dll** from unpacked archive to your SDR# directory.
4. Open **FrontEnds.xml** in your SDR# directory with any text editor.
5. Add the magic line

```
<add key="Fobos SDR" value="SDRSharp.FobosSDR.FobosSDRIO,SDRSharp.FobosSDR" />
```

Finally, **FrontEnds.xml** file should look like this



6. Close and save **FrontEnds.xml** file.
7. Run SDRSharp.exe.
8. Select Fobos SDR item in source drop down list and enjoy using RigExpert® Fobos SDR with SDR# software.

## SDR-Sharp and for Fobos SDR plugin. Very advanced.

Unfortunately, SDR# developers radically changed the software architecture and plugins paradigm since revision 1919 (2023-07-28). If you consider yourself very advanced SDR user and upper-middle level C# developer, If you are ardent fan of SDR# and familiar with SDR# SDK for Plugin Developers you can try to build and install SDRSharp.FobosSDR plugin from sources. Just few easy steps:

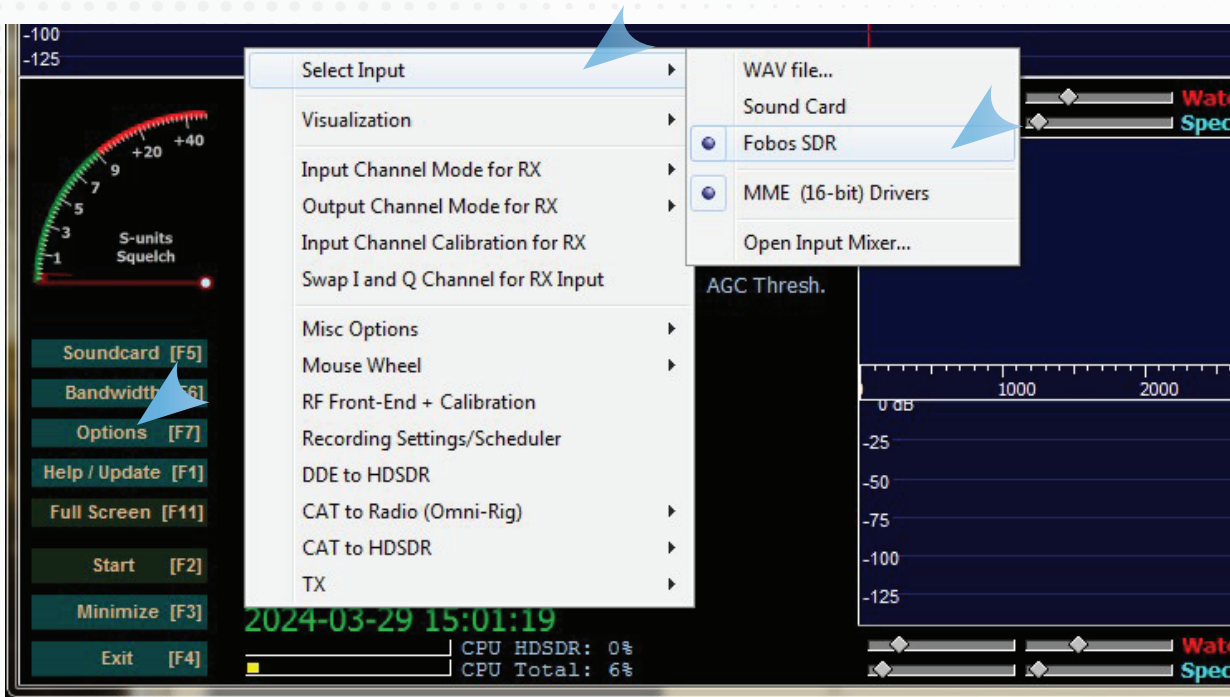
1. Clone SDRSharp.FobosSDR plugin sources from <https://github.com/rigexpert/SDRSharp-FobosSDR-plugin>
2. Port the sources to the new SDR# SDK
3. Build it
4. Have a fun
5. Fill free to commit and push back your work

# HSDR installation and configuration for Fobos SDR. The Easy Way.

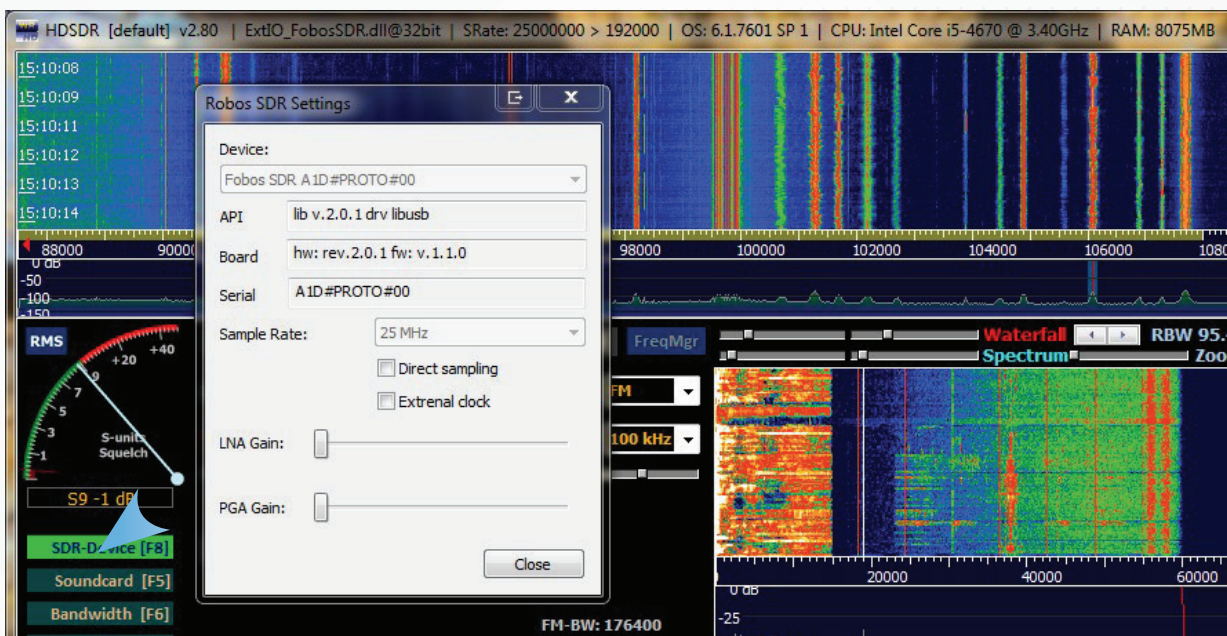


There is an easy way to evaluate RigExpert® Fobos SDR with old-school and state-of-art HSDR software.

1. Go to the <https://rigexpert.com/downloads/> and download the “HSDR Fobos SDR pack” from the “Fobos SDR” section. This pack includes HSDR executables ver.2.70 and ver.2.80, an ExtIO\_FobosSDR.dll plugin, and all necessary libraries.
2. Unpack downloaded zip archive to any directory.
3. Run HSDR\_270.exe or HSDR\_280.exe running HSDR ver.2.70 and ver.2.80 respectively.
4. Hit Options[F7] → Select input → Fobos SDR to select or configure the device



5. In HSDR ver.2.80 and later hit SDR Device [F8] to configure specific options in popup dialog.

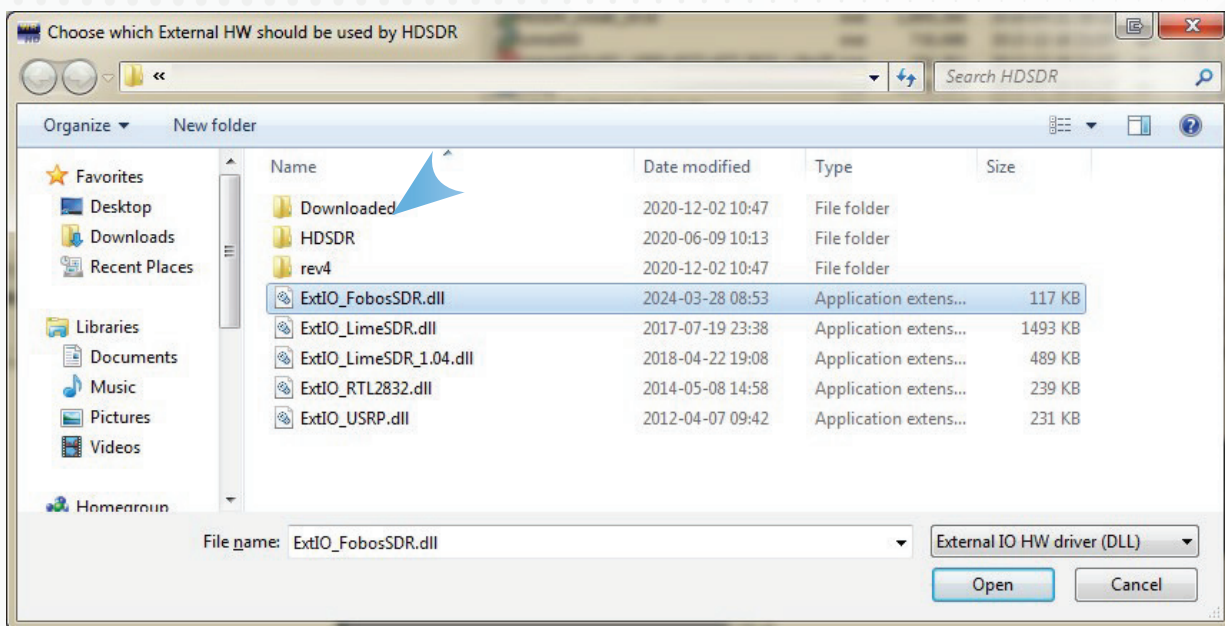


6. Use other HSDR GUI controls in casual way.

# HSDR configuration for RigExpert® Fobos SDR.

If you have your own version of HSDR installed and configured you can add the RigExpert® Fobos SDR support in a such steps:

1. Visit <https://rigexpert.com/downloads/> and download “**HSDR Fobos SDR pack**” in “**Fobos SDR**” section.
2. Unpack downloaded zip archive to any directory
3. Copy three files **ExtIO\_FobosSDR.dll**, **fobos.dll** and **libusb-1.0.dll** from unpacked directory to your HSDR directory.
4. Hit Options[F7] → Select input → Fobos SDR to select or configure the device



5. Configure Fobos SDR in the popup dialog (SDR Device [F8]) and use other your favorite HSDR GUI controls in casual way.

! If you are not familiar with HSDR please visit <http://hdsdr.de/index.html> and feel free to read FAQ section.



# uSDR software and Fobos SDR API setup



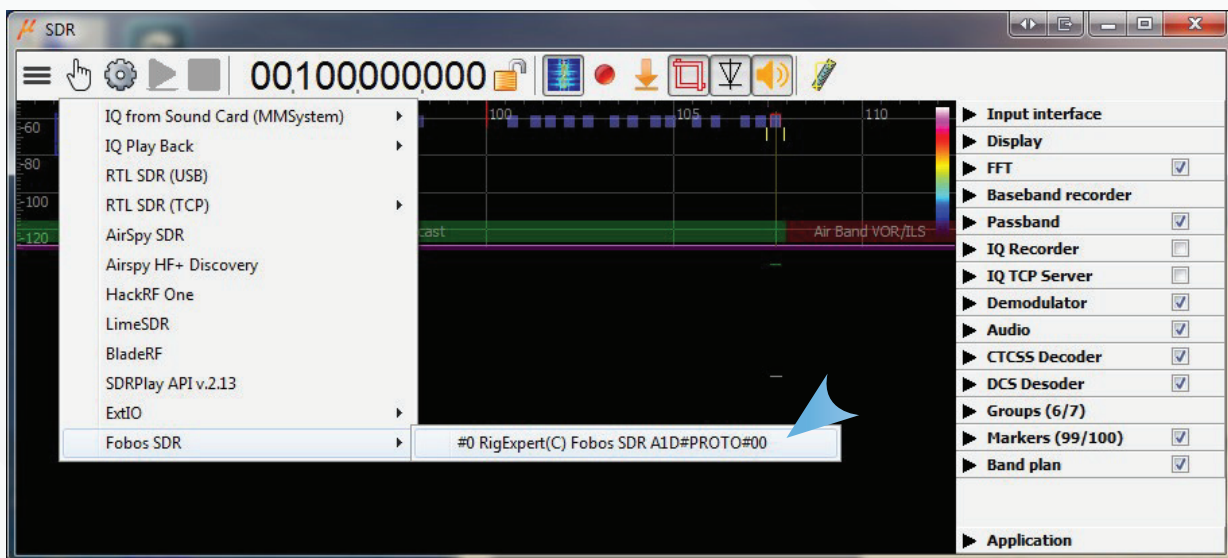
uSDR is a general-purpose multimode software defined radio receiver Windows application. “u” (μ) means micro because of lightweight binaries distributive, simple and compact user interface, highly optimized digital signal processing routines to minimize CPU usage. The software supports a long list of SDR devices and interfaces:

- RTL-SDR (USB)
- RTL-SDR (TCP)
- AirSpy SDR
- AirSpy HF+ Discovery
- HackRF One
- LimeSDR
- BladeRF
- SDRPlay
- ExtIO\_\*.dll compatible devices

Since v.0.1.7.0 Fobos SDR API native support was added.

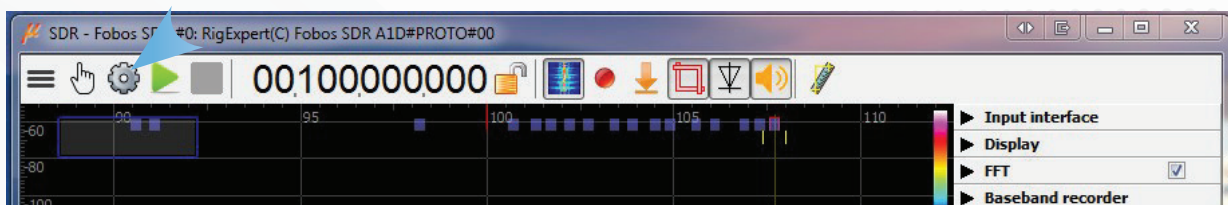
To evaluate all the features just follow these steps:

1. Navigate to <https://sourceforge.net/projects/u-sdr/files/>
2. Download uSDR\_0.1.7.0.zip or late release archive
3. Unpack the archive to any directory
4. Run uSDR.release.exe
5. Hit on the “Hand” button and select Fobos SDR device item

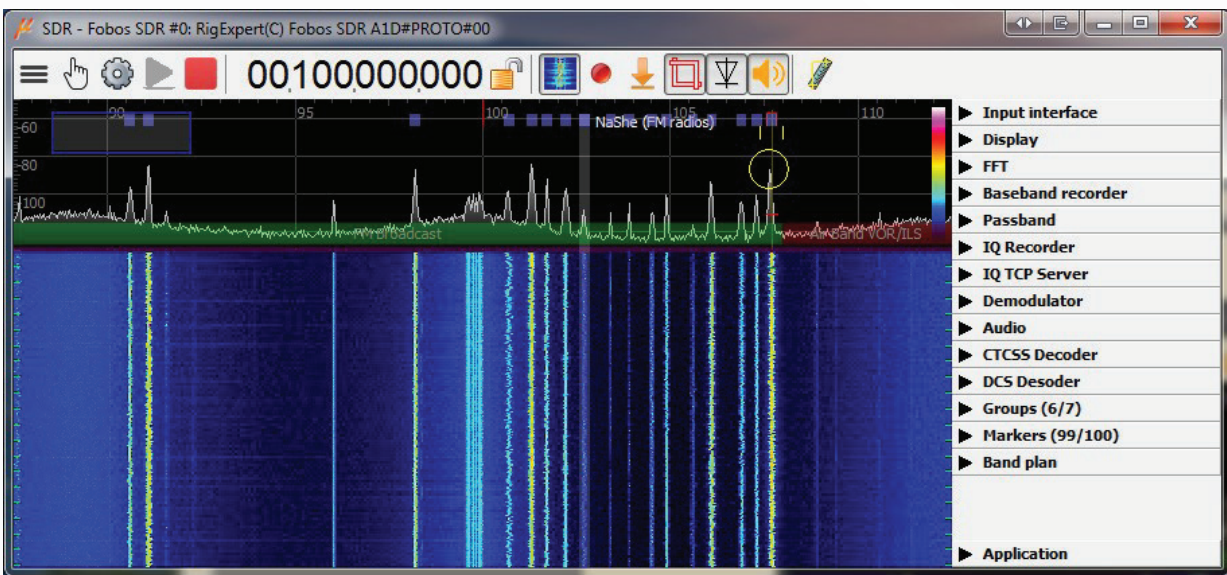


On successful connection the main form caption becomes informative and gray triangle button becomes green

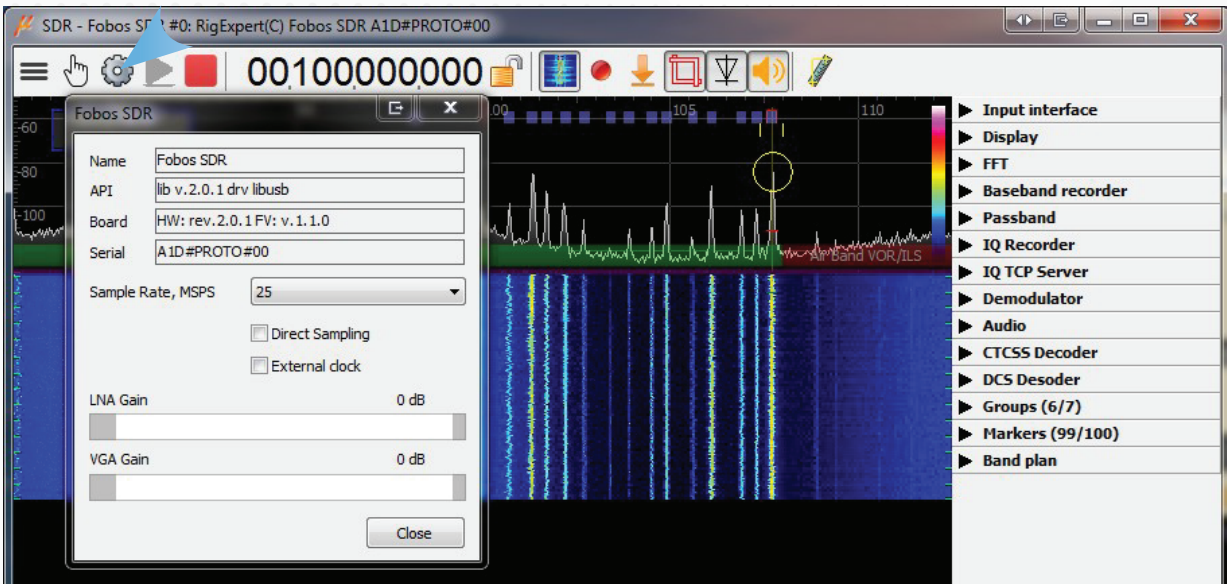
6. Hit the green triangle button to start Rx streaming



Streaming should start immediately; the spectrum and waterfall should look like follows.

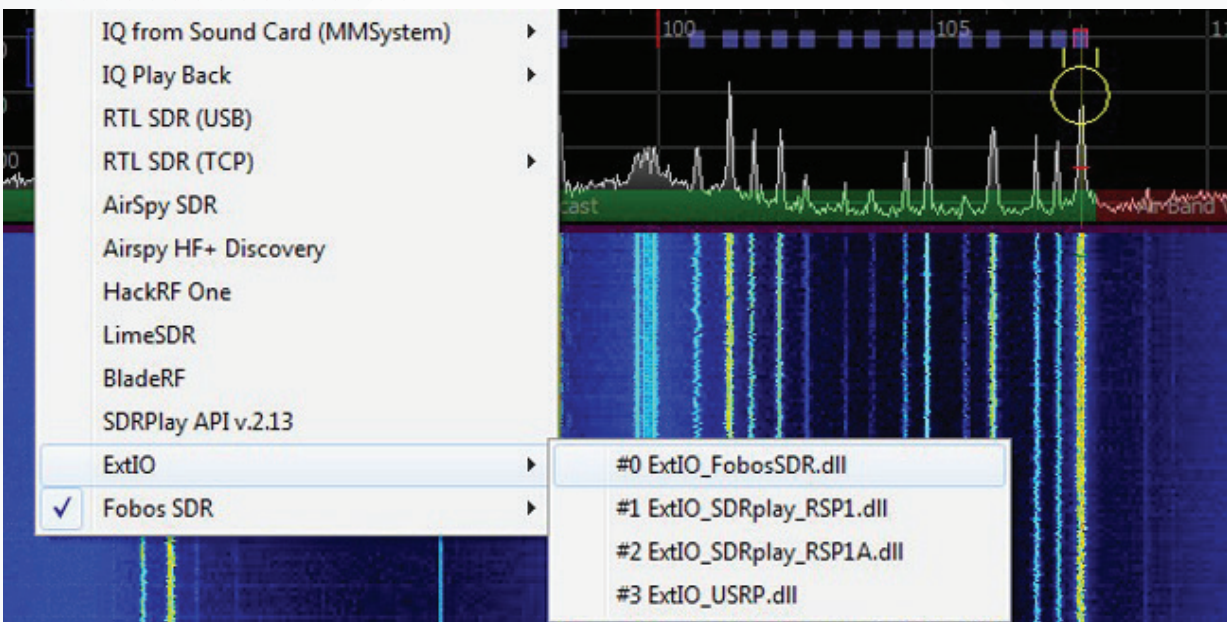


7. Set the specific device parameters in a popup window under the “gear” button.



8. Zoom the spectrum with the mouse wheel, navigate by dragging the spectrum or waterfall, tune to frequency by dragging the band, demodulate it and use all the features of uSDR.

uSDR also supports ExtIO\_\*.dll interface and can deal with the Fobos SDR via ExtIO\_FobosSDR.dll as well.



## **Acknowledgments**

We would like to extend our deepest gratitude to the **SDR# developers**, for their exceptional work in advancing the field of software-defined radio. Their dedication and expertise have been instrumental in the creation of this guide. A special thanks goes to Youssef Touil, whose vision and leadership have undoubtedly paved the way for countless innovations within the SDR community.

Furthermore, our appreciation goes out to the team behind **HSDR**. Their contributions have significantly enriched the user experience for radio enthusiasts worldwide. We are particularly grateful to **Alberto di Bene (I2PHD)**, whose technical prowess and commitment to excellence have been a driving force in the project.

Without the hard work and passion of these individuals and all contributors to both SDR# and HSDR, this Quick Start

Guide would not have been possible. We are truly grateful for your collaboration and support.

The RigExpert Team