Manuals+ — User Manuals Simplified.

RigExpert Fobos Is High Performance General Purpose Software Defined Radio

RigExpert Fobos Is High Performance General Purpose Software Defined Radio User Guide

Contents

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SPCIFICATION

- Operating Frequency Range: 100 kHz to 6 GHz
- Bandwidth: Up to 50 MHz
- Waveform Sampling Resolution: 14-bit
- Connectivity:
    - External Clock Input: 10 MHz, 0.1-3.0 V p2p, SMA Male 1 kOhm
    - Clock Output: 10 MHz, clipped sine, 3.0 V p2p SMA Male 50 Ohm
    - Power Control: 2-pin 2.54 mm header
    - Power and Data Port: USB 3.0 Type-B Male Socket
- Indications:
    - HF1 and HF2: Two auxiliary input channels, coherent direct sampling, 0.1-25 MHz covering SMA Male, 50 Ohm
    - RF: Primary Rx channel. Double frequency conversion heterodyne, 25 to 6000 MHz covering, SMA Male, 50 Ohm

Product Usage Instructions

Hardware Setup:

1. Connect VHF and/or UHF antenna to the RF connector to receive the 25 to 6000 MHz frequency range.
2. Connect HF antennas to HF1 and/or HF2 connectors to receive the 0.1-25 MHz frequency range. For diversity receiving option, two different antennas have to be connected to both HF inputs.
3. Connect the USB-3.0 power and data port to a USB-3.0 port on your PC.
   Note:
     - Please only use USB-3.0 ports. USB-2.0 operation mode is not supported.
     - Use a quality shielded USB-3.0 data cable for proper control and data streaming.
     - Connect the USB cable directly to the root hub of your PC.
     - Avoid using splitters, converters, docking stations, or extension cables.
     - Avoid connecting to front panel USB sockets; use rear panel sockets located directly on the motherboard.
     - Disconnect other power-consuming devices from USB ports until hardware setup is complete.
4. Put a jumper on the power control connector.
5. Disconnect the device and proceed to driver setup.

Driver Installation:

1. Ensure proper drivers for your motherboard's USB-3.0 root hub controller are installed.
2. Check the device manager for any unknown devices or conflicted drivers.
   - **Note:**
   - If your OS automatically installed a driver for Fobos SDR, uninstall it before proceeding.
3. Download Zadig executable from **https://zadig.akeo.ie** and install it.
   - Select Fobos SDR in the drop-down list, choose WinUSB(v.6xxxxx), and click Install Driver.
   - If your OS still installs its own driver, select Fobos SDR and choose Replace Driver or Reinstall Driver in Zadig.

FAQ:

- **Q: Can I use both RF and HF channels simultaneously?**
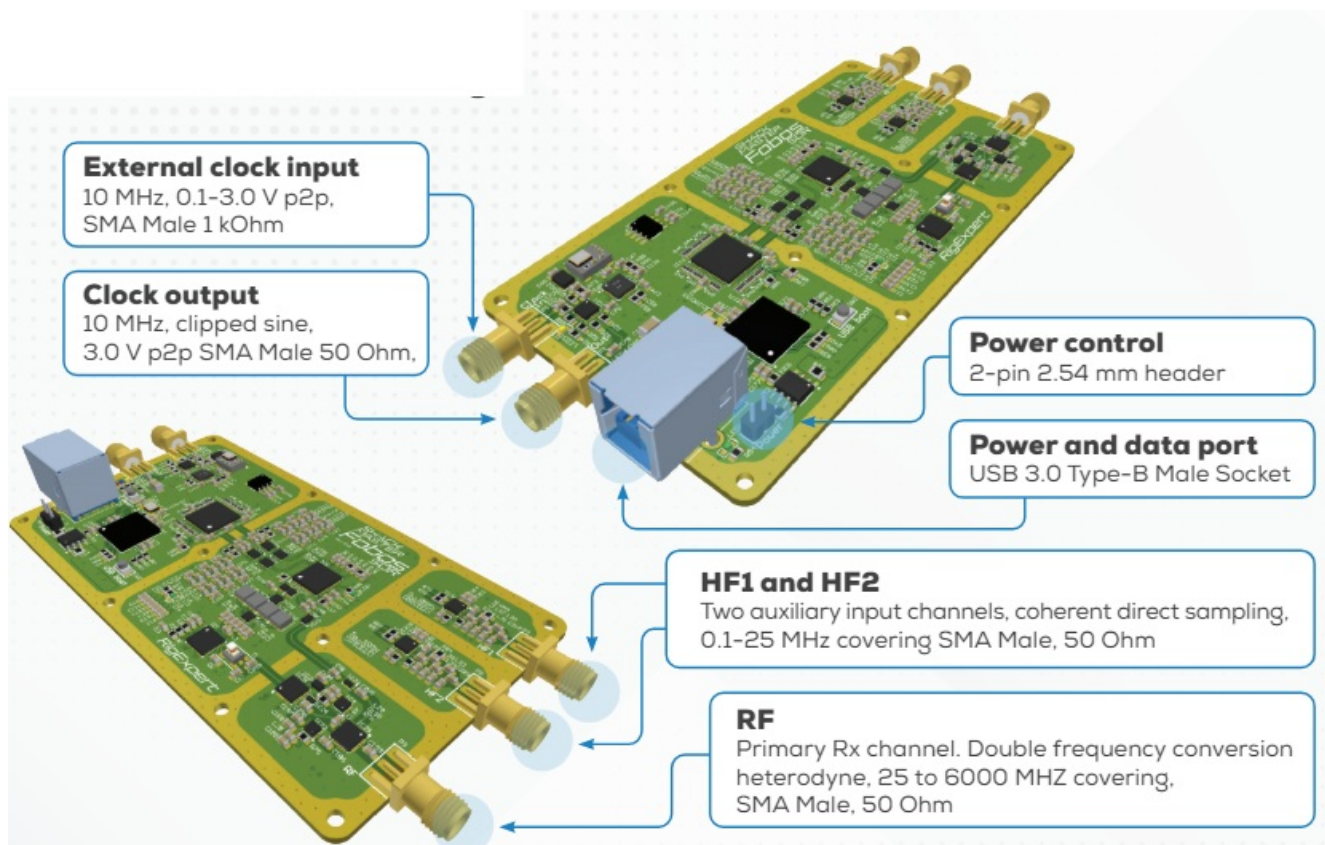 A: No, you can use either RF or HF channels but not both at the same time.
- **Q: What should I do if my device manager does not recognize Fobos SDR?**
  A: Ensure that proper drivers are installed for the USB-3.0 root hub controller, and follow the driver installation steps provided in the manual.
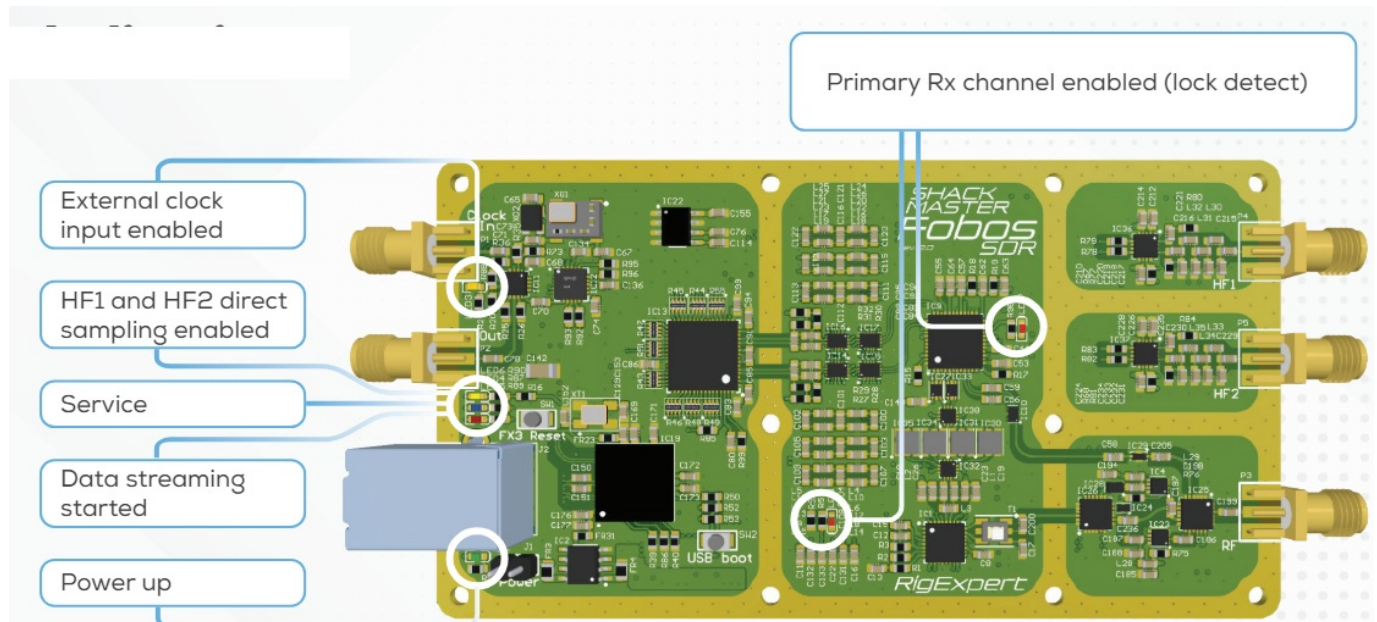
Fobos SDR Quick Start Guide

- 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

External clock input
10 MHz, 0.1–3.0 V p2p, SMA Male 1 kOhm

Clock output
10 MHz, clipped sine, 3.0 V p2p SMA Male 50 Ohm,

Power control
2-pin 2.54 mm header

Power and data port
USB 3.0 Type-B Male Socket

HF1 and HF2
Two auxiliary input channels, coherent direct sampling, 0.1–25 MHz covering SMA Male, 50 Ohm

RF
Primary Rx channel. Double frequency conversion heterodyne, 25 to 6000 MHZ covering, SMA Male, 50 Ohm

Indications

Primary Rx channel enabled (lock detect)

External clock input enabled

HF1 and HF2 direct sampling enabled

Service

Data streaming started

Power up

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 hlg 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.
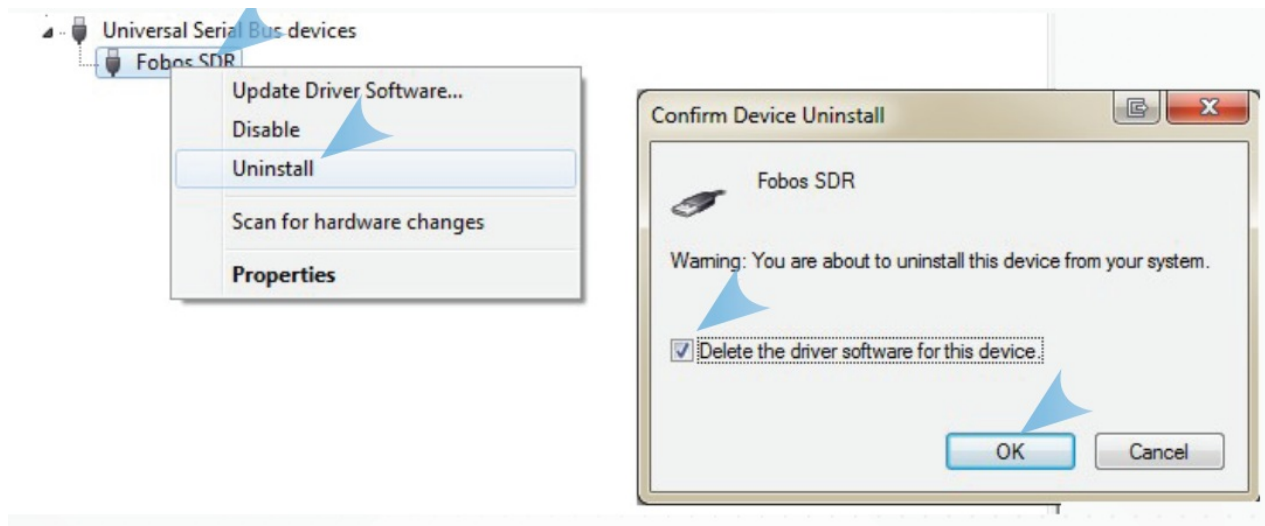
Driver installation

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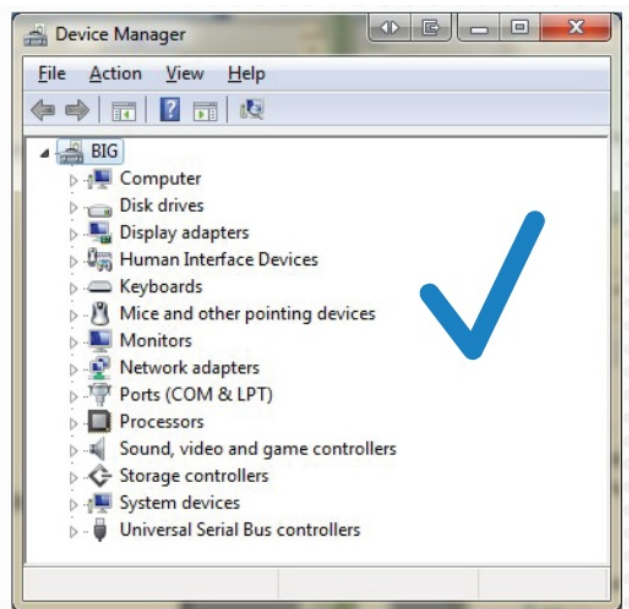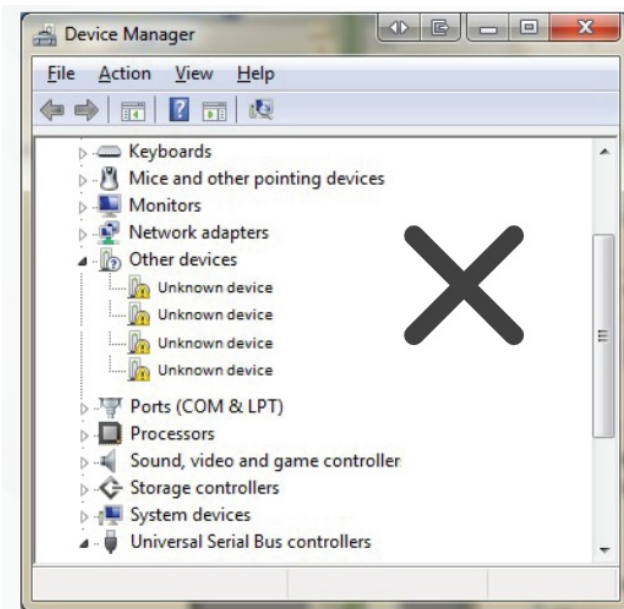
3. Connect RigExpert© Fobos SDR to USB port, wait a second for device to boot up, make sure that new unknown device named Fobos SDR appeared in device manager tree view.
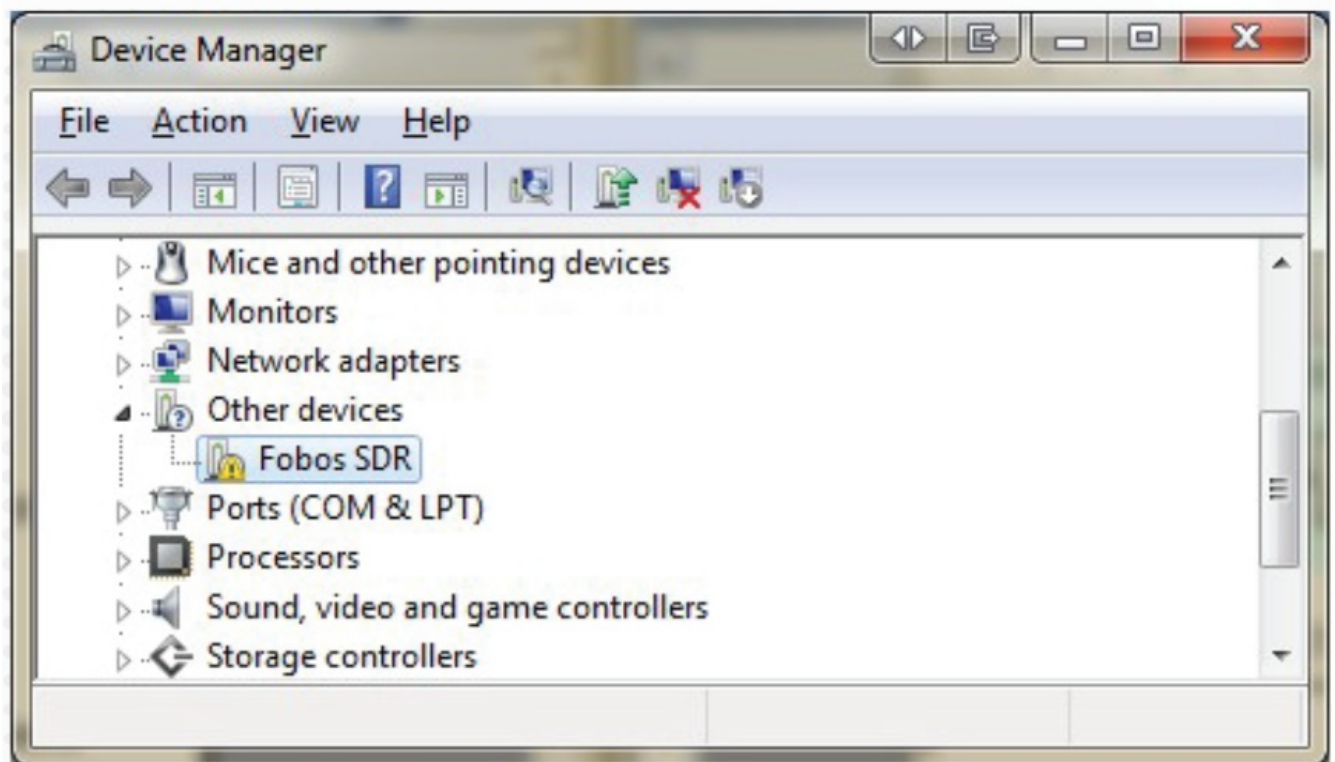

- If your OS automatically installed some driver for Fobos SDR, uninstall it manually,

- 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.
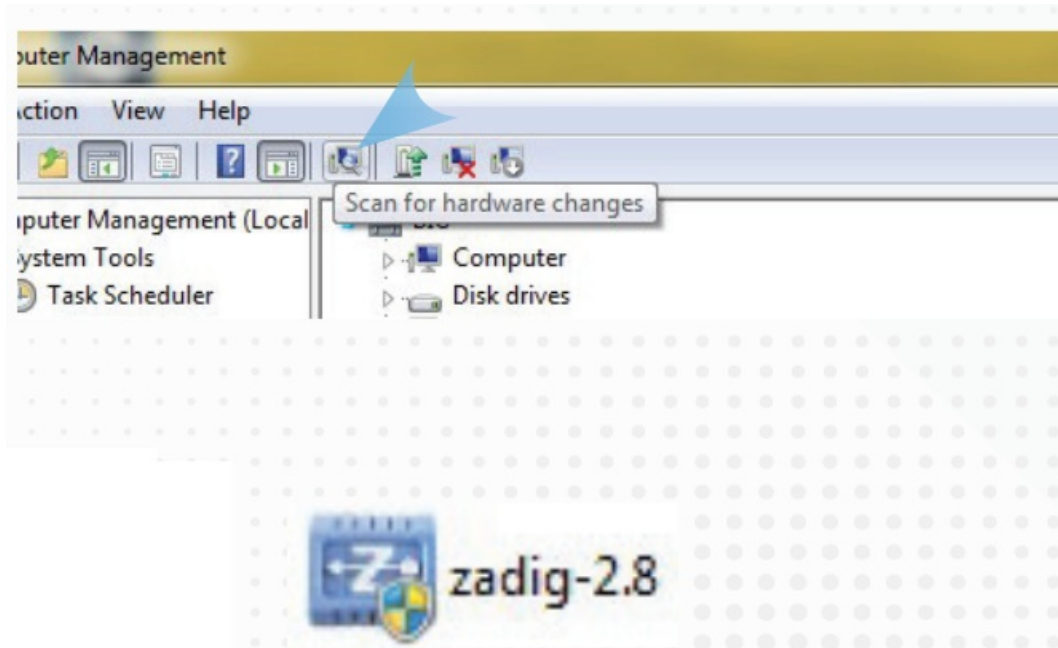

5. Start Zadig executable (administrator permissions may be required), select Fobos SDR item in the drop-down list, ensure the item WinUSB(v.6xxxxx) selected and hit "Install Driver" button
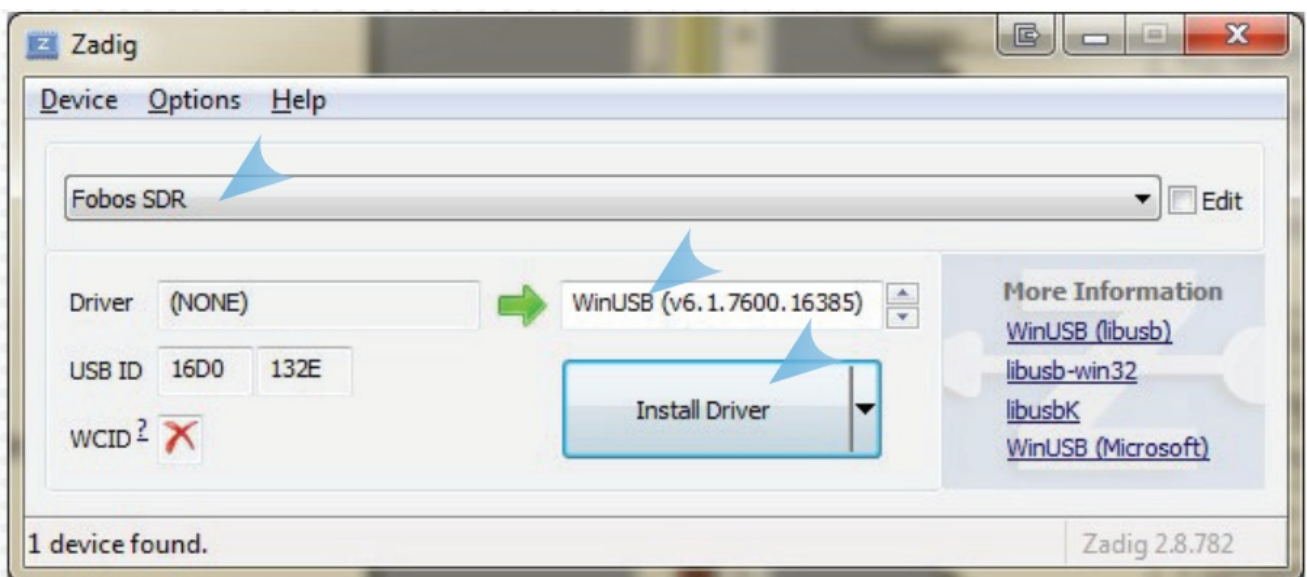

6. If your OS still installs its own driver – no problem, just select "List All Devices" in "Options" menu item, then select Fobos SDR item in the drop-down list and pres this big button named "Replace Driver" or "Reinstall Driver". Finally press Ok in the message box appearing/
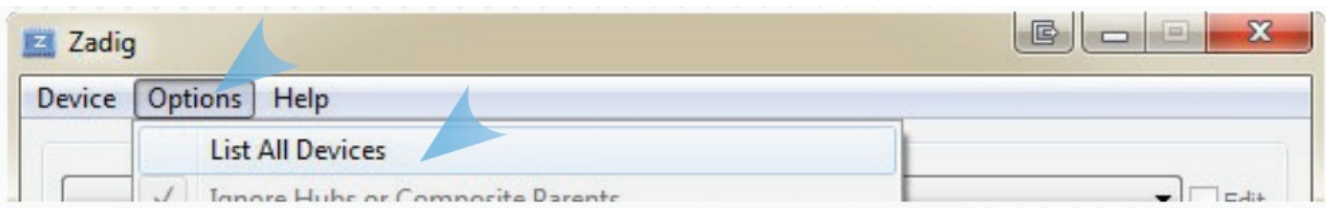
- After successful driver installation your device manager should look something like this
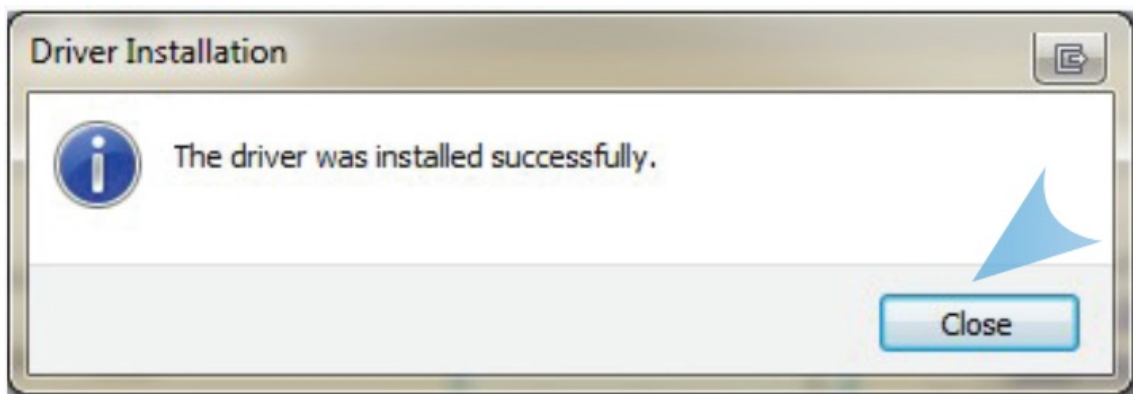
- If any issues or errors occur during driver setup, please double check the hardware setup and operating system configuration.
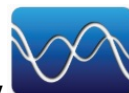- Otherwise jump to software installation and configuration section.
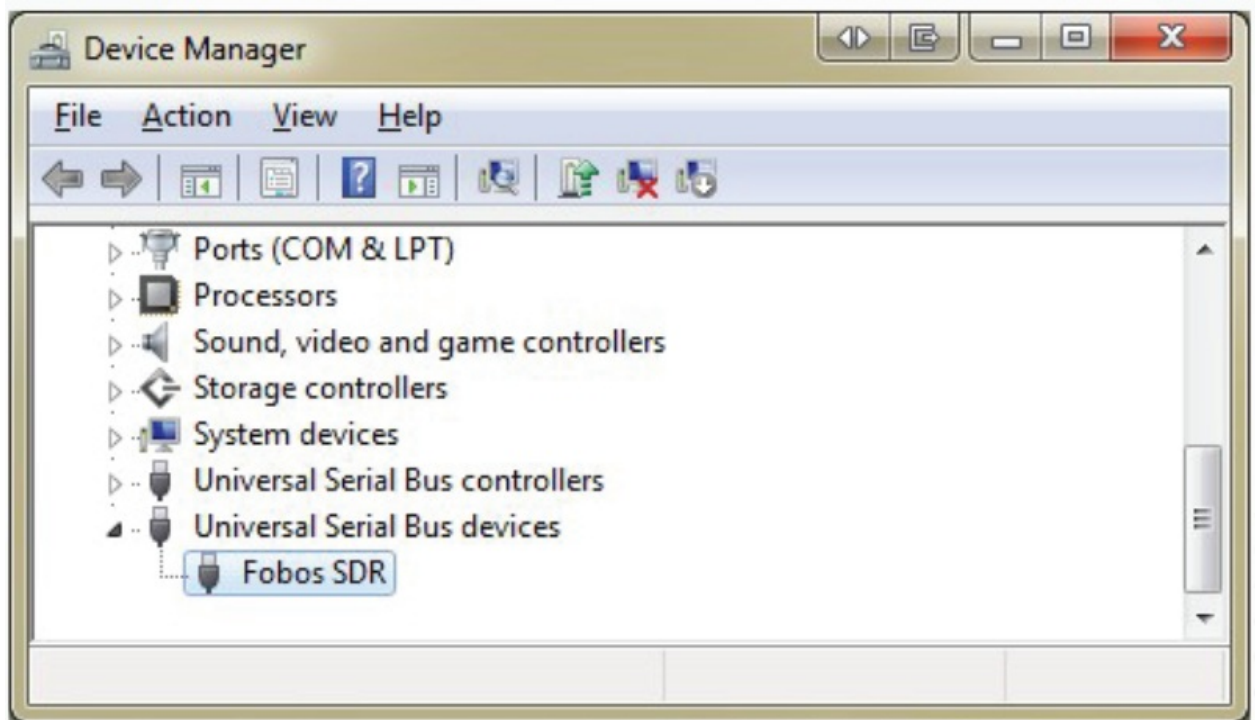
Software installation and configuration

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:

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.
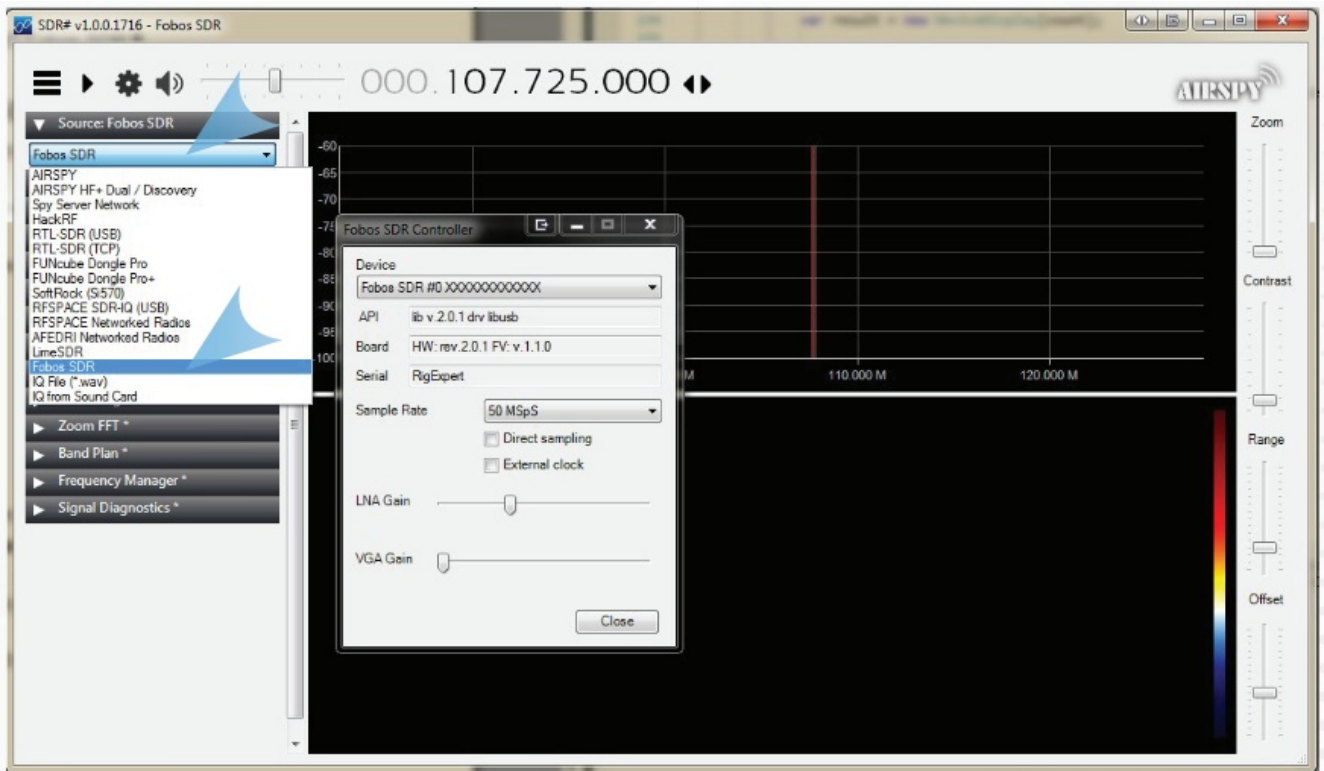

5. Click gear button to configure specific parameters of Fobos SDR frontend.
6. Enjoy using RigExpert© Fobos SDR with SDR# software.
   - If you are not so familiar with SDR# but still want to master it please visit **https://airspy.comdownload/** and download SDR# Big Book – the greatest SDR# user guide 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.

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
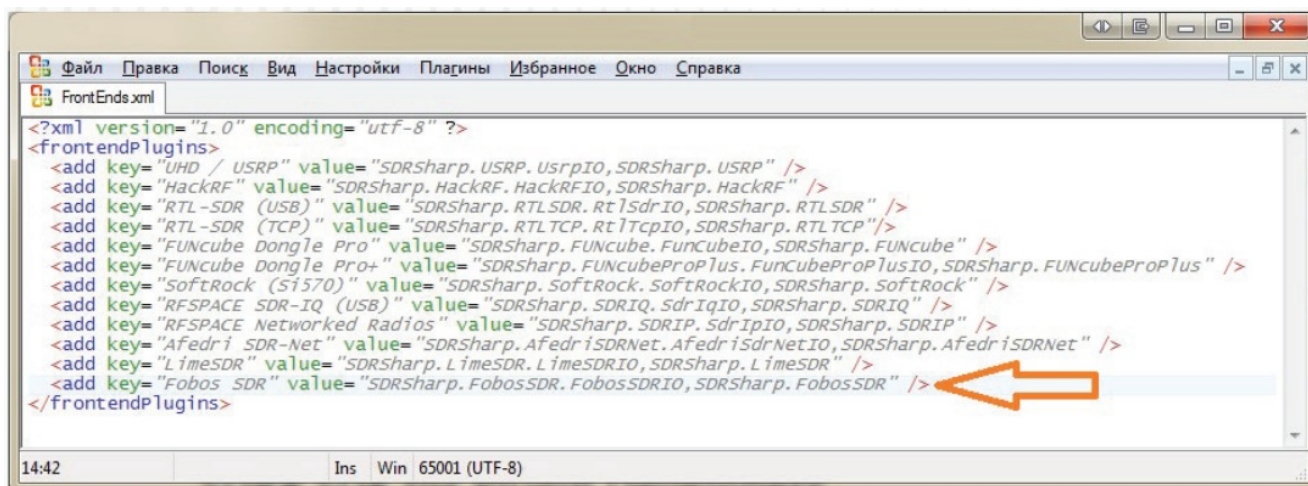
6. Close and save FrontEnds.xml file.

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-pluginrepository**

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

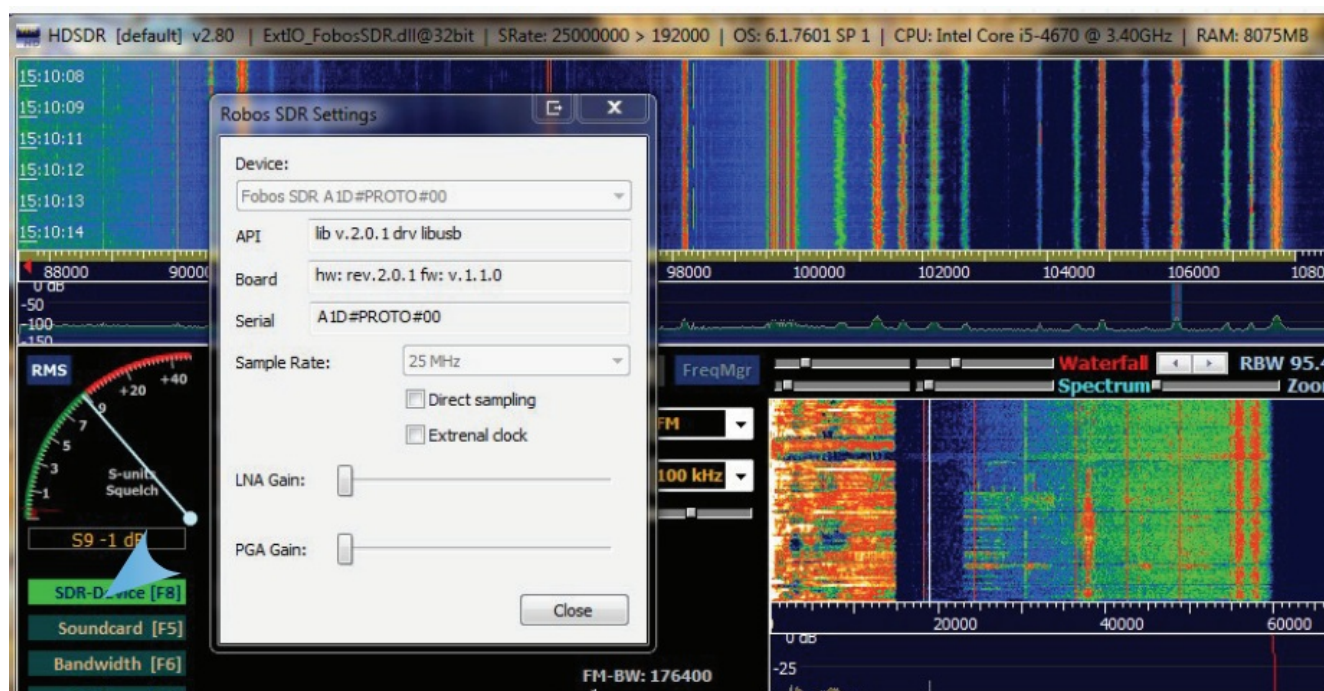**HDSDR installation and configuration for Fobos SDR. The Easy Way.**

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

1. Go to the **https://rigexpert.com/downloads/** and download the "HDSDR Fobos SDR pack" from the "Fobos SDR" section. This pack includes HDSDR 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 HDSDR_270.exe or HDSDR_280.exe running HDSDR ver.2.70 and ver.2.80 respectively.

4. Hit Options[F7] → Select input → Fobos SDR to select or configure the device
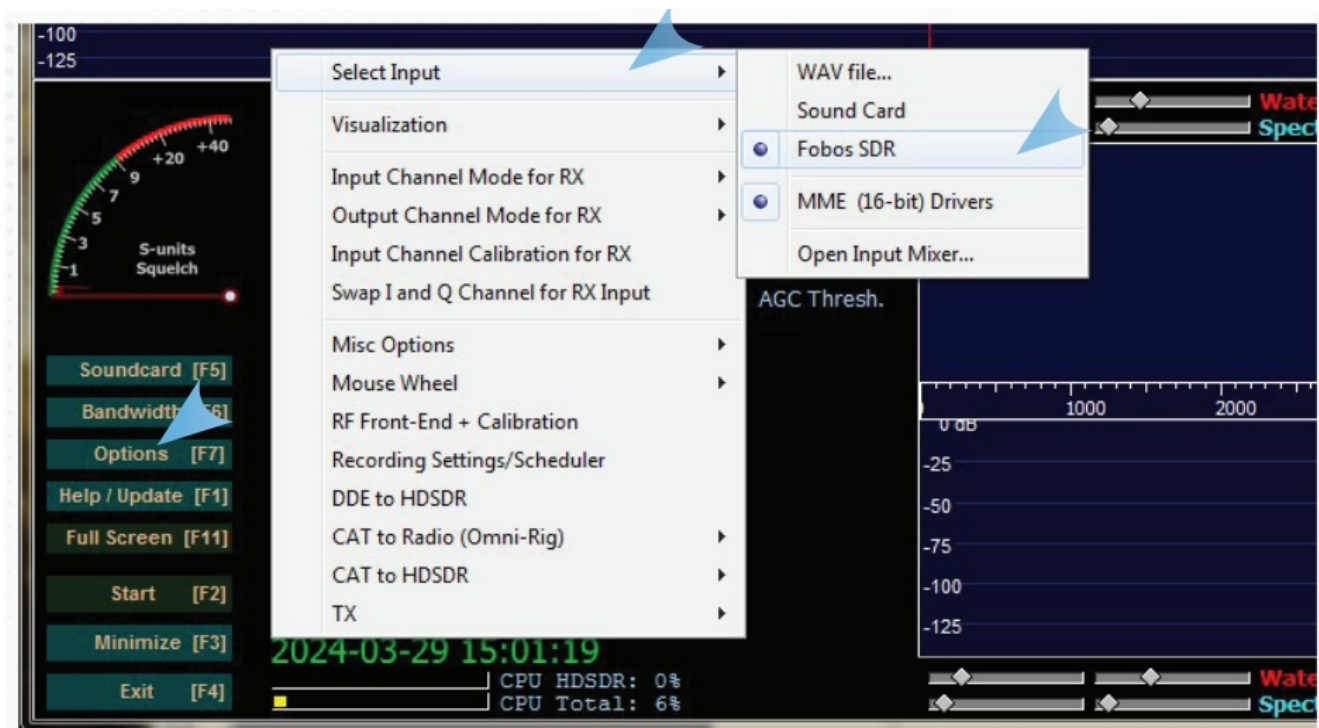
5. In HDSDR ver.2.80 and later hit SDR Device [F8] to configure specific options in popup dialog.
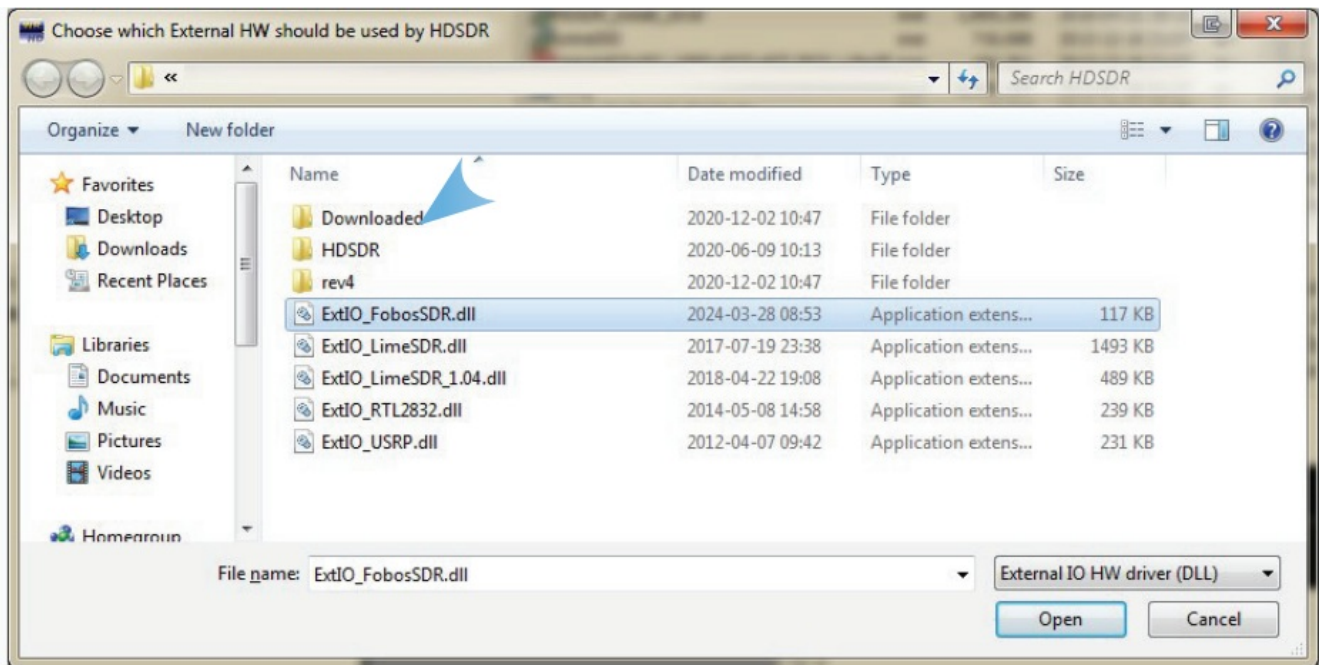

6. Use other HDSDR GUI controls in casual way.

HDSDR configuration for RigExpert© Fobos SDR.

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

1. Visit **https://rigexpert.com/downloads/** and download "HDSDR 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 HDSDR 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 HDSDR GUI controls in casual way.

- If you are not familiar with HDSDR 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
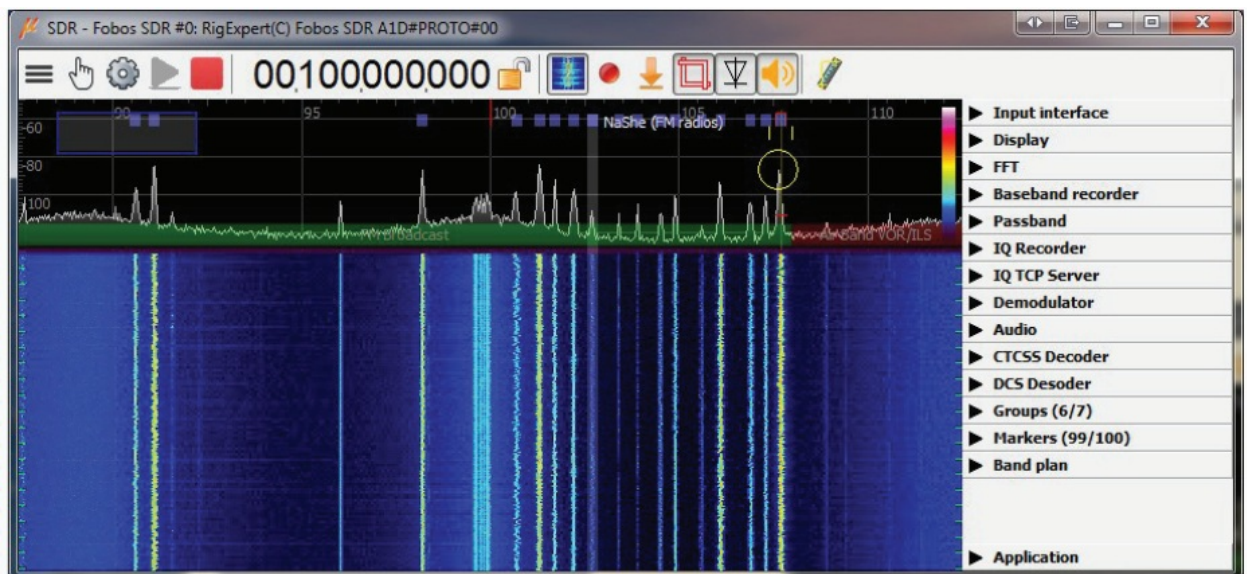5. Hit on the "Hand" button and select Fobos SDR device item
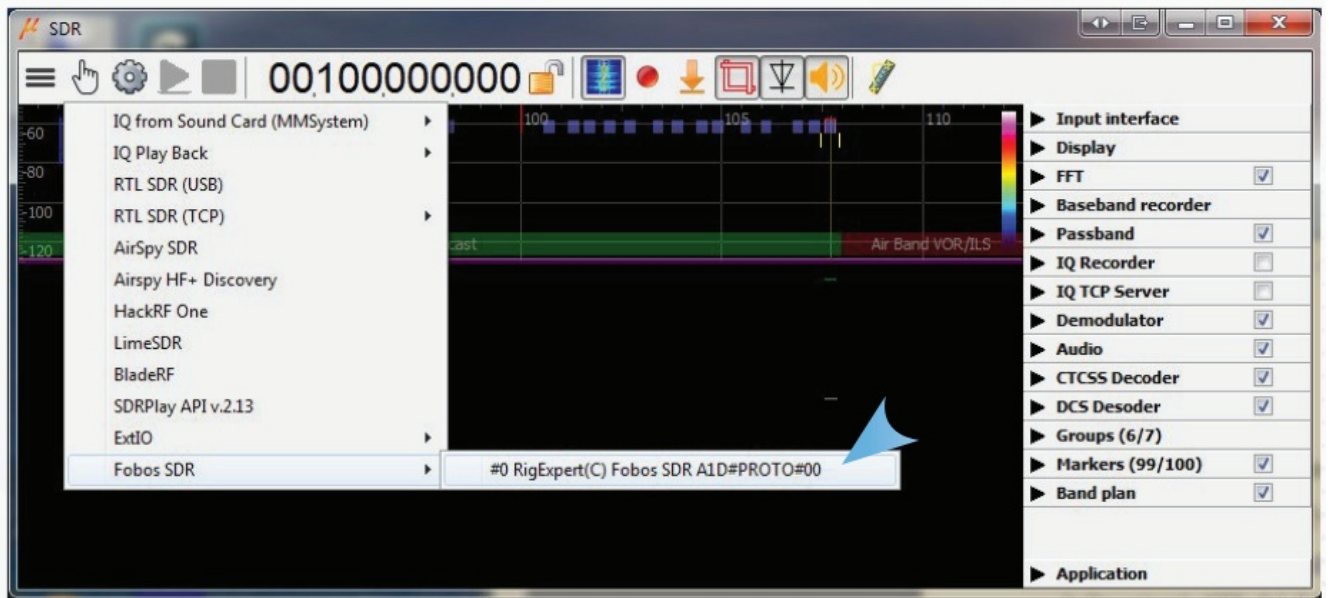
- On successful connection the main form caption becomes informative and gray triangle button becomes green
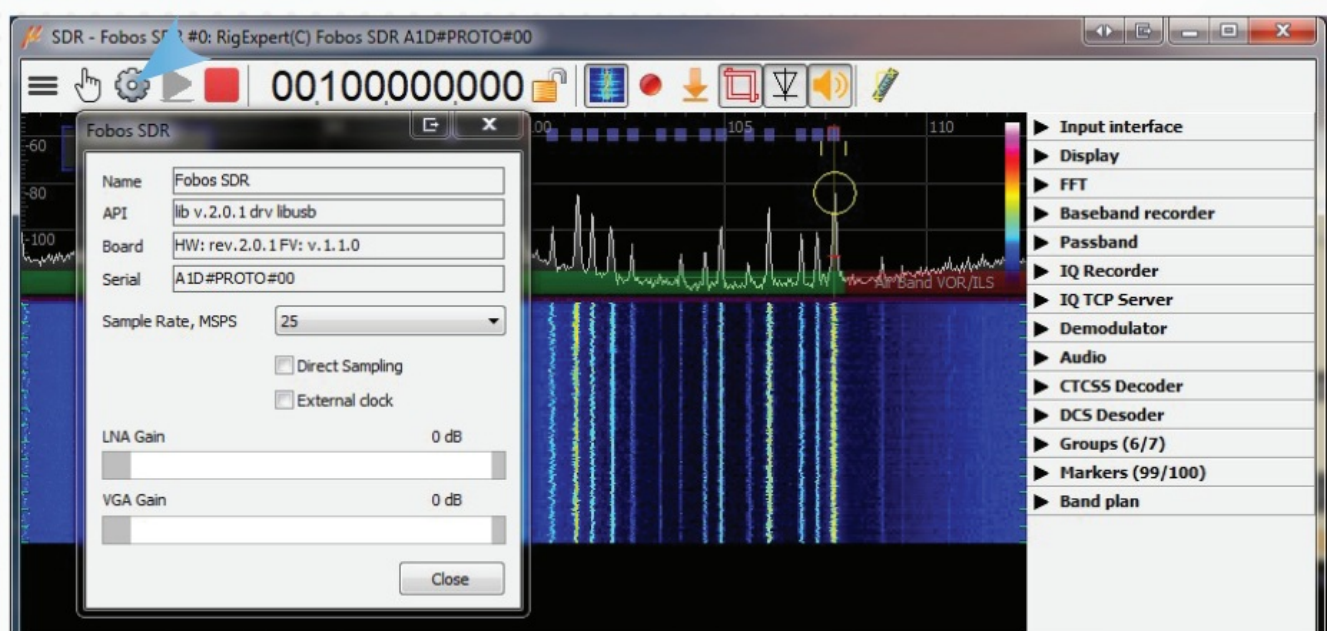
6. Hit the green triangle button to start Rx streaming
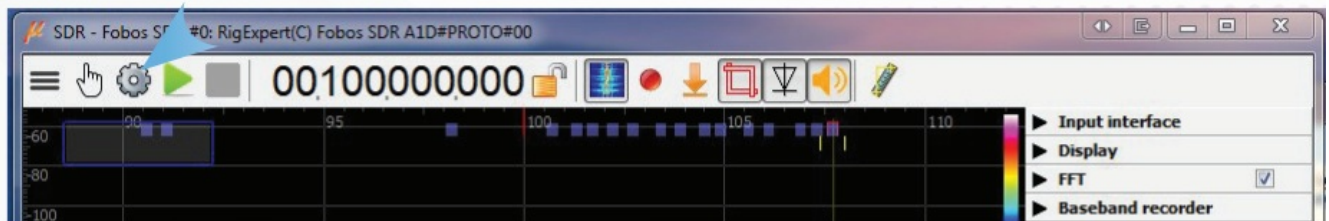

- Streaming should start immediately; the spectrum and waterfall should look like follows.

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.
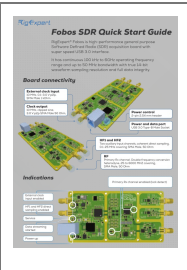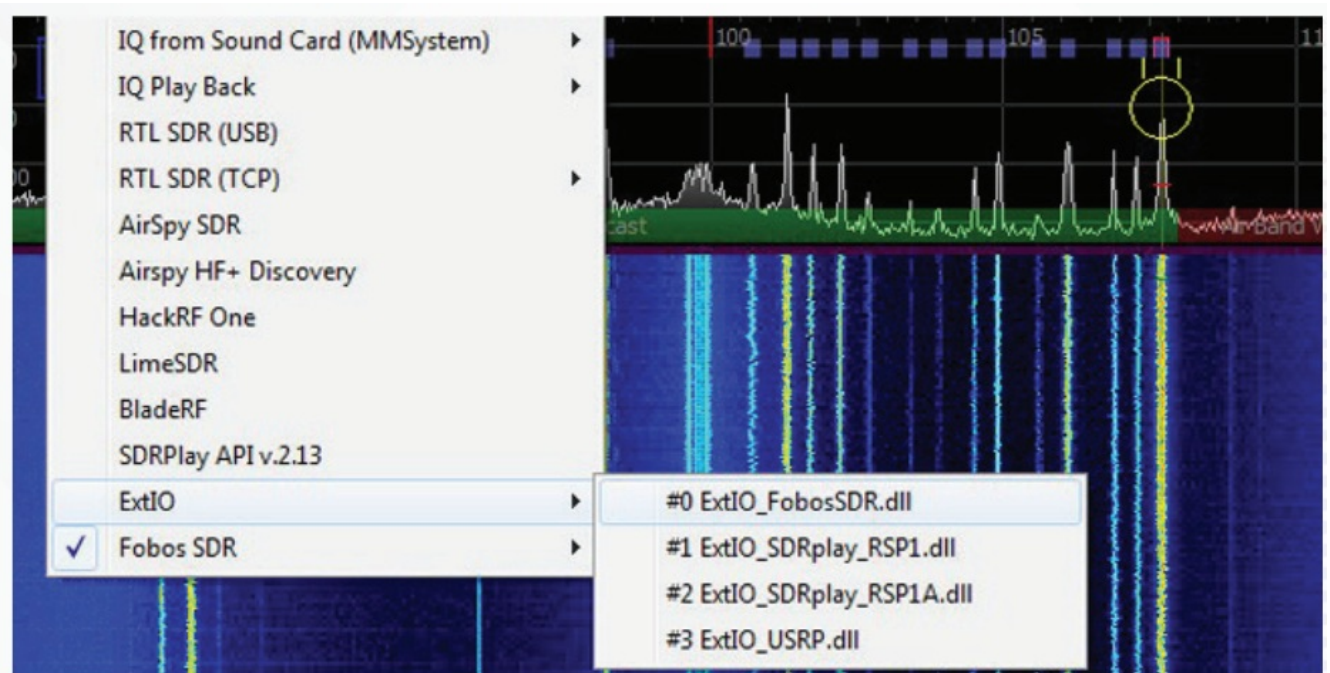

Acknowledgments

- 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 HDSDR. 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 HDSDR, this Quick Start

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

Documents / Resources

RigExpert Fobos Is High Performance General Purpose Software Defined Radio [pdf] User Guide
Fobos Is High Performance General Purpose Software Defined Radio, High Performance General Purpose Software Defined Radio, General Purpose Software Defined Radio, Purpose Software Defined Radio, Software Defined Radio, Defined Radio, Radio

References

- **Airspy SDR - High Quality Software-Defined Radio, Redefined**
- **uSDR - Browse Files at SourceForge.net**
- **Zadig - USB driver installation made easy**
- **User Manual**