

easySDR (v1.1)

SOFTWARE DEFINED RADIO RECEIVER

Instruction manual
Configuration software manual



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1. Technical parameters

Input frequency range	64-1700 MHz
Output audio bandwidth	48000 samples/second
Dimensions	37x22x78 mm
Weight	35g
Supply voltage	5VDC from USB
Power consumption	100mA
Operation temperature	0° C / +70° C
Humidity	95% max.
PC connector	Mini USB-B
Antenna connector	SMA

2. How does it work

2.1. Software Defined Radio

A software-defined radio system, or SDR, is a radio communication system where components that have been typically implemented in hardware (e.g. mixers, filters, amplifiers, modulators/demodulators, detectors, etc.) are instead implemented by means of software on a personal computer or embedded computing devices. While the concept of SDR is not new, the rapidly evolving capabilities of digital electronics render practical many processes which used to be only theoretically possible.

2.2. easySDR receiver

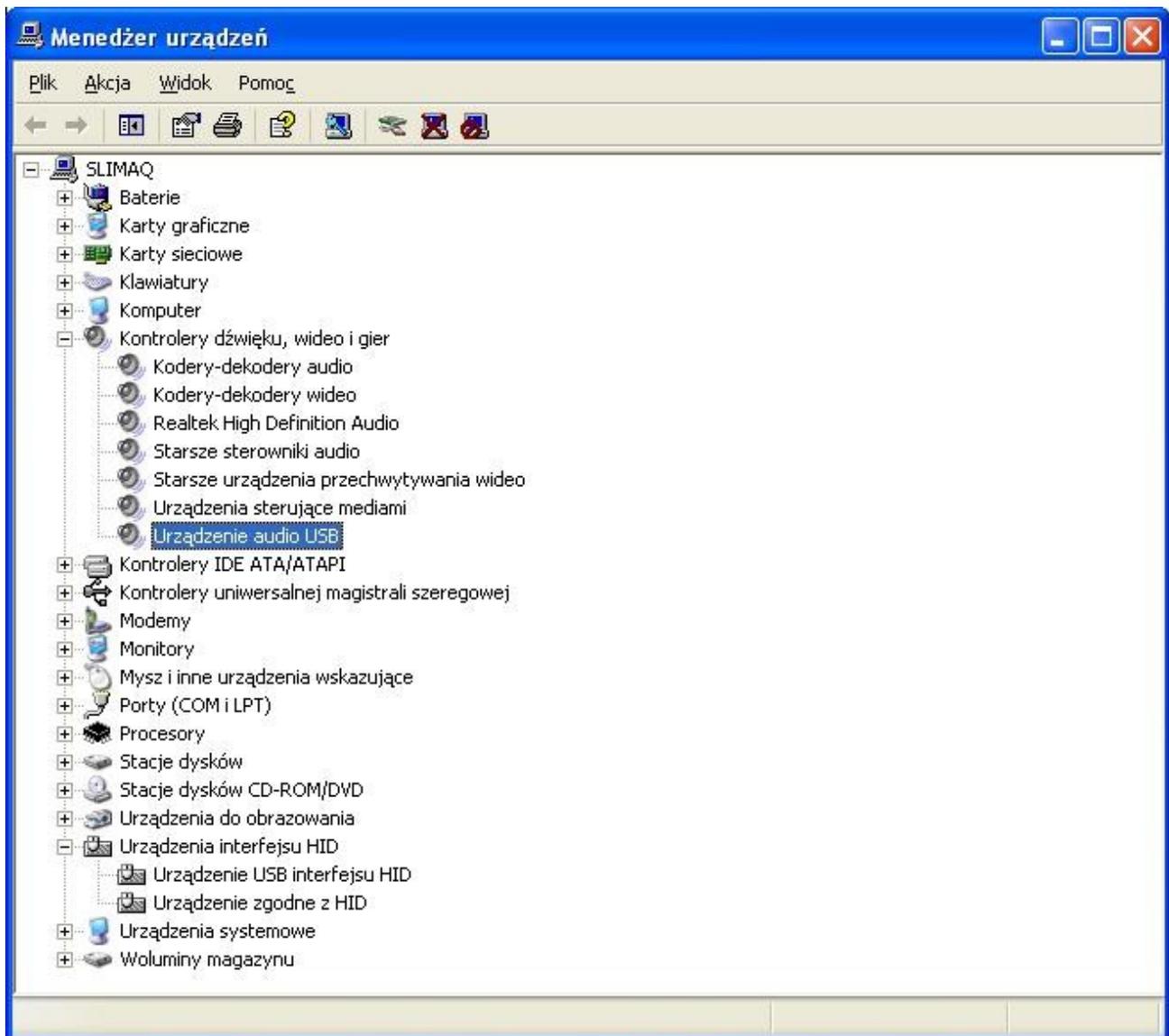
EasySDR is a Software Defined Radio receiver designed for operation with personal computers. Device is based on a highly integrated multi-band RF tuner IC working with configurable input frequencies between 64 and 1700MHz. Desired signal is amplified by a low noise amplifier, tuned to intermediate frequency and then sampled by 16-bit analog-to-digital converter with 48ks/s sample rate. Sampled data is then sent to PC by USB bus and can be decoded by HSDR software (<http://www.hdsdr.de/>).

3. Connecting easySDR

Connection between PC and EasySDR is made using the mini USB A/B cable. Connection with antenna is made with SMA connector.

3.1. Driver installation

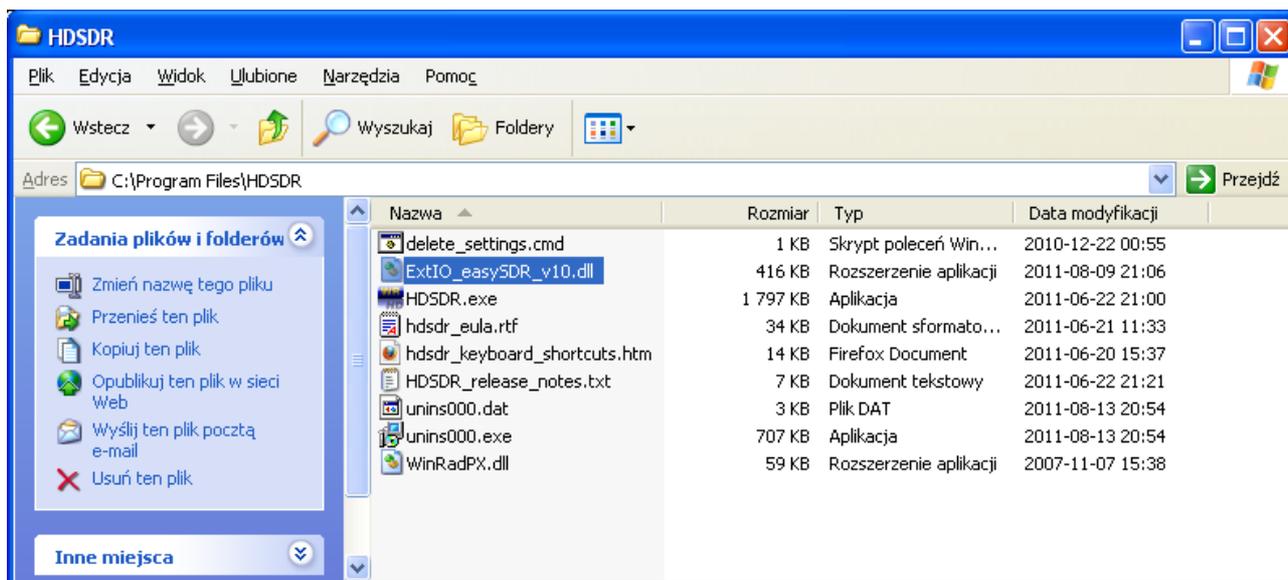
After connecting to PC with Windows operating system, EasySDR should appear in Device Manager without any additional drivers installation. Device appears as a USB audio device and also as a HID compatible device in Windows Device Manager.



3.2. HSDR and EasySDR DLL installation

You can download the latest HSDR application from its authors website at www.hdsdr.de or from our website at www.microsat.com.pl. EasySDR DLL version 1.0 was tested with HSDR version 2.0 but should work also with latter versions without problems. To install HSDR please simply run its installer executable file.

Installation of EasySDR DLL interface library for HSDR consists of copying ExtIO_easySDR_vXX.dll (where XX is the version number) to a catalog where you installed HSDR software.



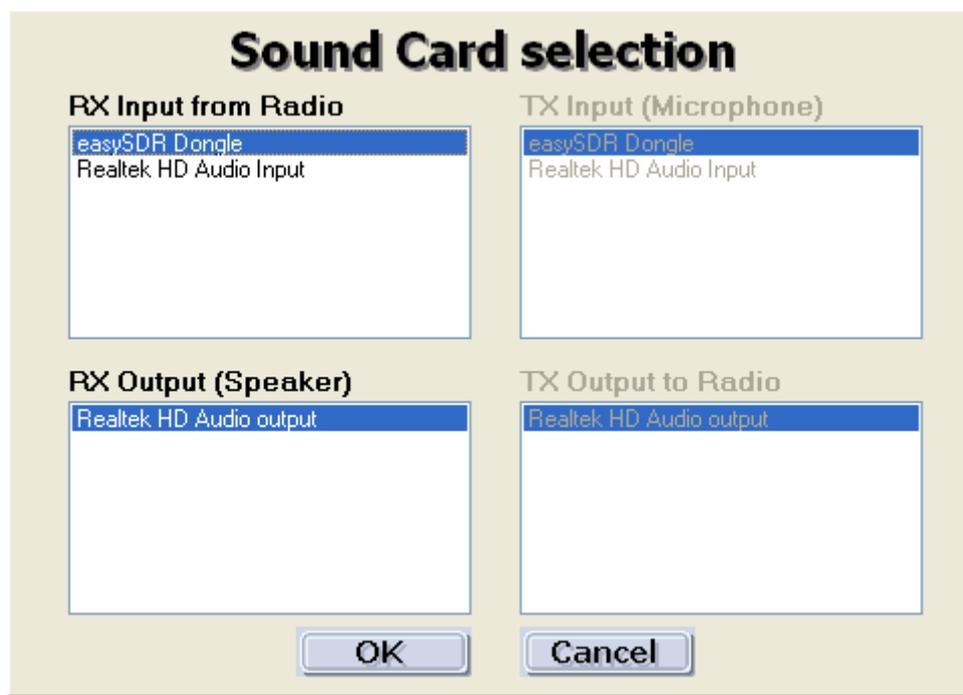
4. Running HSDR application

4.1. HSDR First run

After running HSDR application with EasySDR dongle connected to USB, you should see a message windows indicating that device was found in the system.



Next you should select RX Input and RX output applicable to your computers audio device configuration. As input please select easySDR Dongle and as output select a sound card device available in your PC.



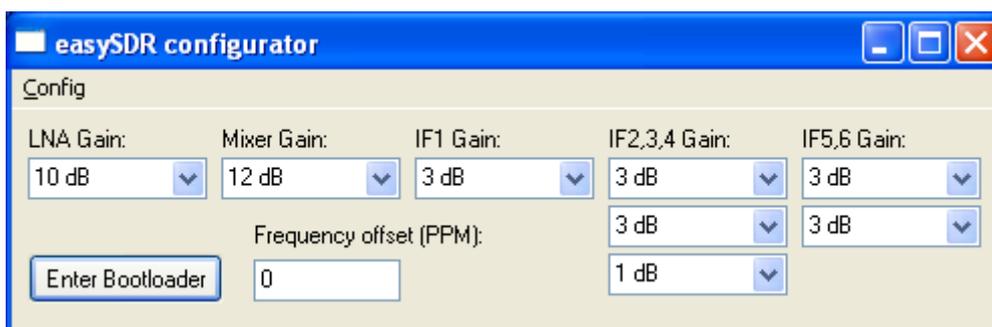
It is sometimes necessary to click “options->select input->easySDR” in applications menu.

To start acquiring audio data from the device, please select Start button in HSDR application. You can change the receiver frequency with “LO” digits of the application.

For more information about using HSDR application, please refer to its authors website (<http://www.hdsdr.de>) or search the internet.

4.2. EasySDR ExtIO DLL window

EasySDR DLL interface configuration is available after clicking on ExtIO button or going to “options->select input->easySDR”. You should see a form as below.



In easySDR configurator window you can select various amplifier levels of devices tuner chipset. You will probably need to experiment with setting for various input frequencies and signal levels.

It is also possible to compensate for frequency offset of devices frequency generator. Values are expressed in PPM (points per million).

To save current configuration you need to click on “Config->Save to file” button in forms menu section.

5. Device firmware

EasySDR device firmware can be upgraded to most up-to-date version by its users. Firmware bootloader was written in a way that it is practically impossible to “brick” the device with wrong firmware file.

5.1. Firmware upgrade procedure

When downloading new version of the software pack, please upload new firmware hash file to the device to be sure that it is compatible with the current DLL version.

1. Plug easySDR to USB port,
2. Run easySDR_bootloader.exe,
3. Click "Enter bootloader",
4. Bootloader will write "easySDR found.",
5. Wait for a few seconds for device to enter bootloader (you should hear USB disconnect and then USB connect sound in Windows),
6. Click "Write firmware", select proper easySDR_firmware_vXX.hash (where XX is the version number) file and wait a few seconds for upload to complete,
7. easySDR is now updated to the current version.