Getting started with the RFx

Engineering Design Team, Inc.

Version 1.0

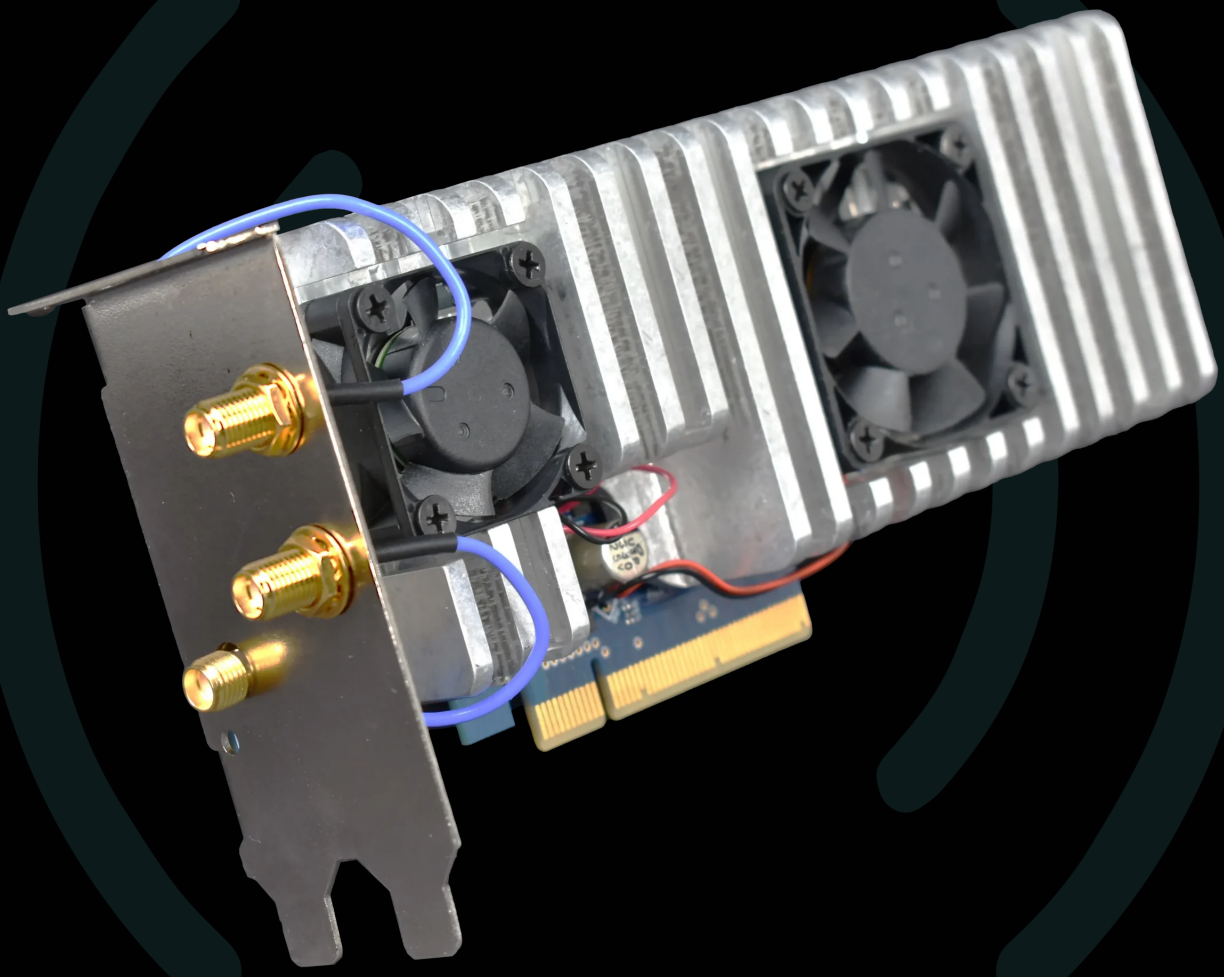

Table of Contents

Overview

The EDT RFx is a Software Defined Radio (SDR) designed to fit a small (half-height) PCIe form factor. It features two independent RF Input channels of 125 MHz BW that can be tuned from 400 MHz to 6 GHz. Multiple Digital Sub-Tuners can be connected to either Input, which resample selected bandwidth regions of flexible size (250 kHz to 250 MHz). [1] Advanced AGCs are built into the firmware which properly load the ADC and digital downconversion stages, achieving the best possible SNR.

[1] For the initial SoapySDR driver release, only a single Sub-Tuner is connected to each RF Input.

Software Installation

The software support is installed under **/opt/edt/rfx**:

Directory	Description
/opt/edt/rfx/docs	Documentation
/opt/edt/rfx/examples	C++ and Python examples of Soapy API usage
/opt/edt/rfx/flash	Firmware
/opt/edt/rfx/grc	GNURadio support and example GRC applications
/opt/edt/rfx/lib	SoapySDR drivers (for both 0.7 and 0.8)

On Ubuntu 20+ systems, first install the edt repo config from packagecloud:

```
curl -s https://packagecloud.io/install/repositories/edt/main/script.deb.sh | sudo bash
```

Then install the RFx support package:

```
sudo apt-get install rfx_soapy
```

For a standard GNU Radio installation, we rely on the PPA:

```
sudo add-apt-repository ppa:gnuradio/gnuradio-releases
```

```
sudo apt-get update
```

```
sudo apt-get install gnuradio python3-packaging
```

Firmware

The rfx_soapy package includes the latest release firmware which can be installed with pciload:

```
/opt/EDTpcd/pciload /opt/edt/rfx/flash/rfx.bit
```

API Documentation

Installing rfx_soapy will automatically install **libsoapysdr-dev** and **libsoapysdr-doc**. The latter will place API docs under: **/usr/share/doc/libsoapysdr-doc/html**

Refer to the included **agc.pdf** document for specific information on AGC/DAGC operation and control.

Example Applications

Soapy API usage

The rfx_soapy package includes examples of RFx specific Soapy API usage in C++ and Python under:

```
/opt/edt/rfx/examples
```

GNURadio usage

Dual channel Spectrum Analyzer / Recorder

1. Open the application via GRC:

   ```
   gnuradio-companion /opt/edt/rfx/grc/rfx_soapy_grc_demo1.grc
   ```

2. Start the application by clicking on the play button.
3. Adjust the control values as needed.

Python

By default the above GRC steps will generate the python code for the app when the play button is clicked. This python code is installed as a part of the package:

```
python /opt/edt/rfx/grc/rfx_soapy_grc_demo1.py --help
```

```
python /opt/edt/rfx/grc/rfx_soapy_grc_demo1.py
```

Support

Send any feedback or questions to:

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