NAME

AFEDRI RF Recorder v2.1b, 2012 k3it

afedrec.exe

SYNOPSIS

afedrec.exe [OPTIONS] BASE_FILE_NAME

DESCRIPTION

afedrec is a simple recorder for the AFEDRI SDR-Net. It captures the I/Q UDP stream and saves it into a WAV file suitable for playback in sdr software (HDSDR, SDR-Console, SpectraVue, etc). LO, timestamp, and sample rate metadata is saved in a Winrad compatible header.

The sdr is automatically located on the network via a broadcast discovery. If there are multiple SDRs on the network the one which responds first will be used.

Any sample rate can be specified, however it will be automatically adjusted to something that is compatible with AFEDRI (currently (Aug 2012) ~32k to ~1.3 MSPS). The front end clock (calibrated) frequency is taken into account during sample rate calculations.

Performance

afedrec program has a separate worker thread for writing data to disk. This means that UDP socket reads are "non-blocking" and the UDP packets will not be lost if there is a disk slowdown. Instead they will accumulate in a Queue (as much as memory allows) and drain to the disk at their own pace. This is useful when recording during high disk activity (for example anti-virus runs). If more than 10% packet drop is detected the program will print a warning, however it will not stop recording. If you use high sampling rates make sure there is adequate network bandwidth and processing power on the PC for receiving a high volume of data. 1.3 MHz sampling rate requires 40+ Mbps. The application creates a very small CPU load on a PC with DMA access to the network card and disks (most pcs made in the last ten years have DMA). I'm getting a couple of percent CPU utilization at 1.3 MSPS.

BASE_FILE_NAME

Prefix that should be added to the WAV file names. Mandatory argument.

-h, --help show help message and exit

-s SAMPLE_RATE, --sample-rate=SAMPLE_RATE

sampling rate in Hz [default=192231]

This value may be automatically adjusted to something suitable for the SDR. In this case a Warning message will be printed on the screen.

-c LO_FREQ, --lo-freq=LO_FREQ

SDR center frequency [default=10000000]

-t DURATION, --duration=DURATION

duration of the recording in seconds [default=60]

-W FILE_SIZE, --file-size=FILE_SIZE

WAV file split size in MB [default=1000]

"nextfilename" header will be updated for continuous (chained) playback in HDSDR

-g GAIN, --gain=GAIN

Set VGA gain in dB. (-10 to +35db in 3 db steps)

This value may be automatically adjusted to a compatible value.

In this case a Warning message will be printed on the screen.

EXAMPLES

- save afedrec.exe to some known directory (c:\afedrec\)
- open a command prompt in windows
- cd to a directory where you want files saved
- enter the afdedrec.exe command with flags

1. Save an hour of RF samples in c:\temp\sdr-recordings, centered at 14.050 MHz, default sample rate, and split files every 100 MB. Set file base name to SDR:

```
>cd c:\temp\sdr-recordings

c:\temp\sdr-recordings>c:\afedrec\afedrec.exe -c 14050000 -t 3600 -W 100 SDR
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found  SDR-IP          43124844        192.168.123.8 50000
Setting LO to: 14050000
Setting Sampling Rate to: 192231
Wrting to:  SDR_20120825_235748Z_14050kHz_RF.wav
.....................................................................................
.................
starting a new file:  SDR_20120826_000004Z_14050kHz_RF.wav
.....................................................................................
.................
starting a new file:  SDR_20120826_000221Z_14050kHz_RF.wav
.....................................................................................
```

2. Save ten seconds of RF samples, centered at 1 MHz, 1.3 MSPS, set VGA gain to +8 db (note sample rate auto correction):

```
> c:\afedrec\afedrec.exe -s 1300000 -c 1000000 -t 10 -g 8 AMBAND
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found  SDR-IP          43124844        192.168.123.8 50000
Warning: invalid sample rate selected for the AFEDRI main clock (79998644 Hz)
         setting to the next valid value 1300000  =>  1333311.0
Setting Gain to: 8 db
Setting LO to: 1000000
Setting Sampling Rate to: 1333311
Wrting to:  AMBAND_20120830_030551Z_1000kHz_RF.wav
.................................................
```

Scheduling future recordings

You can use **Windows Task Scheduler,** either GUI or command line **("AT" command).**

The "**Wizard**" allows to create quick simple schedules. For more options select task properties/Advanced - for example to create hourly recordings or complex recurring schedules.