

Software Defined Radios

kurz SDR Radios



Hardware und Preise

- RTL-SDR DONGLES
- Hier gibt es inzwischen viele Abkömmlinge auf der Basis von RTL2832U Chip.
- Mein Favorit RTL SDR V3 Frequenz 10khz – 1750 Mhz

RTL-SDR BLOG V3 R820T2 RTL2832U 1PPM TCXO SMA SOFTWARE DEFINED RADIO (DONGLE ONLY)



\$20.95

934 in stock

1

Add to cart

SKU: 2 Category: [Uncategorized](#)

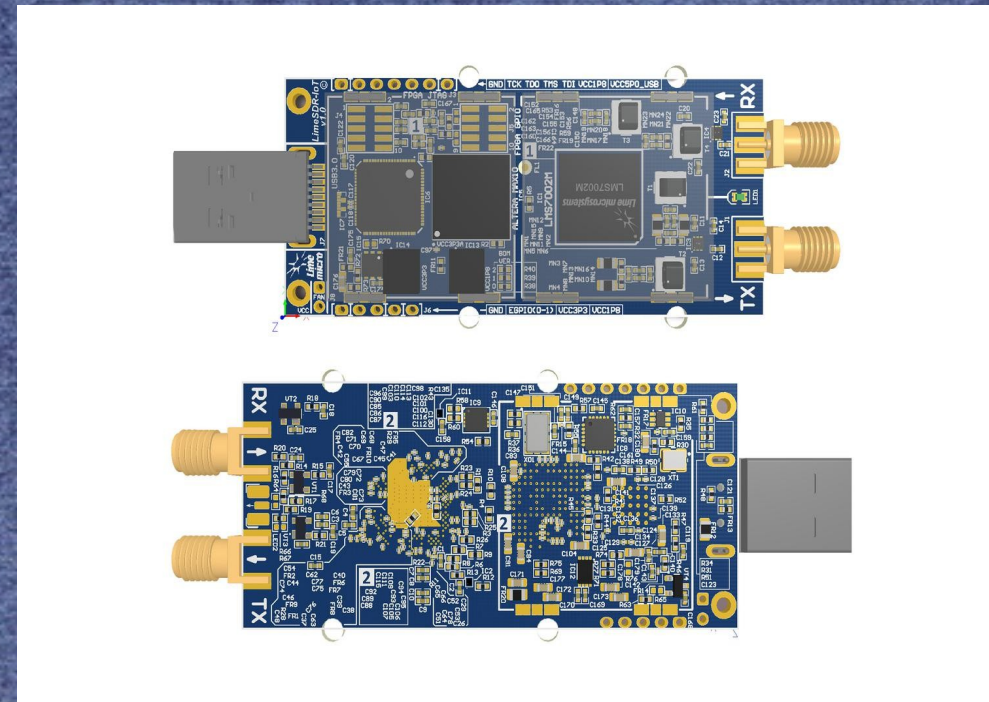
Hardware und Preise

Adalm Pluto SDR 70 -6000 Mhz ca. 100 EUR

Bezug: Mouser oder Digi Key



- Hack RF One ca. 300 EUR
- SDR play 1 khz – 2 Ghz 120 -270 EUR
- Lime SDR mini 100 khz – 3,8 Ghz ca. 160 US \$
- auch sendefähig.
- Perseus 10 khz - 40 Mhz Lime mini
- ca. 800 EUR



- FIFI SDR Bausatz angeboten in „Funkamateuer“
- Preis ca. 110 EUR 10 khz – 30 Mhz
- In Alu Gehäuse USB 2 und Preselektor



Zur Info .Habe noch einen abzugeben: 80 EUR

- SDR auf Basis von Red Pitaya für KW
- Preis ca. 350 EUR
- Projekt wurde in cq DL beschrieben.



Es folgt eine kleine Übersicht derzeit vorhandener SDR's mit Daten und Preisen.

Auszug SDR Radios Wikipedia

en.wikipedia.org/wiki/List_of_software-defined_radios

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List of software-defined radios

From Wikipedia, the free encyclopedia

This article provides a list of commercially available **software-defined radio** receivers.

Name	Type	Frequency range	Max bandwidth	RX ADC bits	TX DAC bits	TX capable	Sampling rate	Panadapters / Receivers	Host Interface	Windows	Linux	Mac	FPGA	Base price
ADAT ADT-200A ^[1]	Pre-built	10 kHz – 30 MHz (planned modules for 50–54 MHz, 70.0–70.5 MHz, and 144–148 MHz)	0.5–100 kHz	?			?	1/3	Embedded system (no computer needed), USB, Internet remote	Yes, with option R-1 & ADAT Commander	?	?		CHF 5,220
AD-FMCOMMS2-EBZ ^[2]	Pre-built	2400 – 2500 MHz		12	12	Yes	61.44 MSPS	2/2	FMC (to Xilinx board) then USB 2.0 or Gigabit Ethernet.	Yes	Yes	Yes		US\$750
AD-FMCOMMS3-EBZ ^[3]	Pre-built	70 MHz – 6 GHz	54 MHz due to filter	12	12	Yes	61.44 MSPS	2/2	FMC (to Xilinx board) then USB 2.0 or Gigabit Ethernet.	Yes	Yes	Yes		US\$750
AD-FMCOMMS4-EBZ ^[4]	Pre-built	70 MHz – 6 GHz	54 MHz due to filter	12	12	Yes	61.44 MSPS	1/1	FMC (to Xilinx board) then USB 2.0 or Gigabit Ethernet.	Yes	Yes	Yes		US\$399
AD-FMCOMMS5-EBZ ^[5]	Pre-built	70 MHz – 6 GHz		12	12	Yes	61.44 MSPS	4/4	FMC (to Xilinx board) then USB 2.0 or Gigabit Ethernet.	Yes	Yes	Yes		US\$1,125
ADALM-PLUTO ^[6]	Pre-built	325 MHz – 3.8 GHz (70 MHz – 6 GHz with software modification ^[7])	20 MHz (streaming may be less due to USB 2.0)	12	12	Yes	61.44 MSPS	1/1	USB 2.0, Ethernet & WLAN with USB-OTG adapter	Yes	Yes	Yes	Xilinx Zynq Z-7010	US\$99
AFEDRI SDR ^[8]	Pre-built	100 kHz – 30 MHz	1.85 MHz	?		No	80 MSPS	0/2	USB 2.0, 10/100 Ethernet	Yes	Yes	Yes		US\$249
AirSpy ^[9]	Pre-built	24 – 1750 MHz		12	N/A	No	20 MSPS MSps ADC sampling, up to 80 MSPS for custom applications	0/1	USB	Yes	Yes	Yes using ports	none	US\$169
AirspyHF+ ^[10]	Pre-built	9 kHz - 31 MHz 60 MHz - 260 MHz	660 kHz	18	N/A	No	36 MSPS	0/1	USB	Yes	Yes	Yes		US\$199

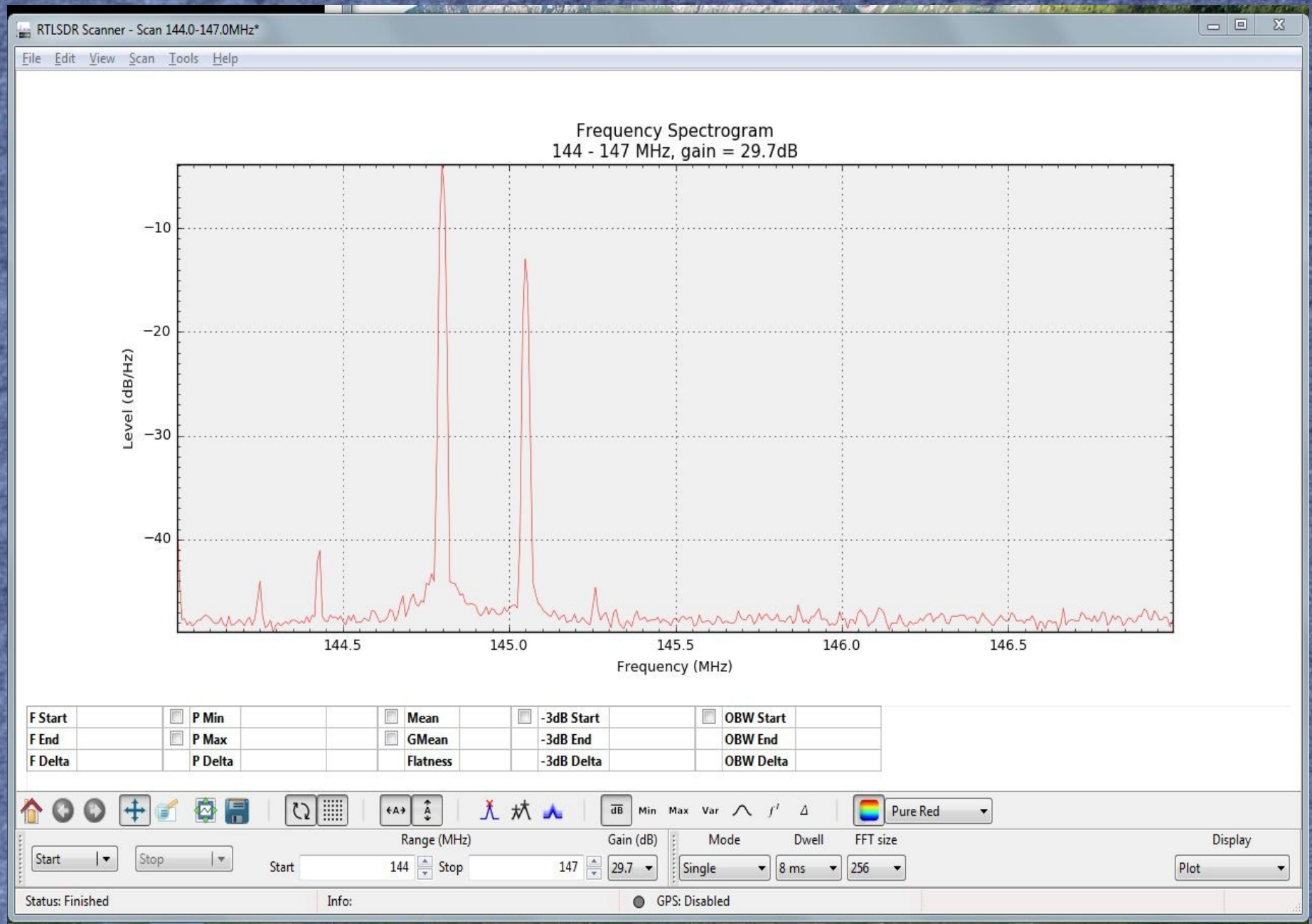
Weitere SdR's

Realtek RTL2832U DVB-T tuner ^[65]	Pre-built with custom driver	24 – 1766 MHz (R820T tuner) (sensitivity drops off considerably outside this range, but can go 0–2,200 MHz (E4000 tuner with direct sampling mod))	Matches sampling rate, but with filter roll-off	8		No	2.8 MHz (can go up to 3.2 MHz but drops samples)	?	USB	Yes	Yes	Yes		US\$8-US\$10
RDP-100 ^[66]	Pre-built	RX, 0 – 125 MHz; TX, 0–200 MHz		?		Yes	RX: 250 MSPS TX - 800 MSPS	?	Embedded System	No	No	No		Unknown
RTL-SDR V3 Receiver Dongle (hardware modded R820T2/RTL2838U DVB-T Tuner Dongles) ^[67]	Pre-built and pre-modded with custom driver	0.5 – 1766 MHz (mod: RTL2832U Q-branch pins soldered to antenna port) ^[68]	Matches sampling rate, but with filter roll-off	8		No	2.4 MHz (can go up to 3.2 MHz but drops samples)	?	USB	Yes	Yes	Yes		US\$24.5-US\$25.5
SDRplay: RSP1 ^{[69][69]}	Pre-built	10 MHz				No	2 X10 MSPS with 8 built-in preselection filters	1/1	USB	Yes	Yes	Yes	none	US\$99
SDRplay: RSP2 ^{[70][69]}	Pre-built	1 kHz – 2 GHz				No	2 X 10 MSPS with 10 built-in preselection filters and 3 antenna ports	1/1	USB	Yes	Yes	Yes	none	US\$169
Soft66AD / Soft66ADD / Soft66LC4 / Soft66RTL ^[71]	Pre-built	0.5 – 70 MHz				No	External ADC required (I/Q output)	0/1	USB	Yes	Unofficially	?		US\$20
SDR-IQ ^[72]	PnP	0.1 kHz – 30 MHz		?			66.666 MHz	1/1 ?	USB	Yes	Yes	Yes		US\$525
SDR-IP ^[73]	PnP	0.1 kHz – 34 MHz		?			80.0 MHz	1/1 ?	Ethernet	Yes	Yes	Yes		US\$2,999
SDR-LAB SDR04 ^[74]	Pre-built	0.4 – 4 GHz		?			40 MHz	?	USB 3.0 SuperSpeed	Yes	Yes	Yes		Unknown
SDRX01B ^[75]	Pre-built and kit option	50 kHz – 200 MHz		ext		No	< 2 MHz External ADC required (I/Q output)	0/1 - Scalable (multiple receiver can be connected to the same LO)	Ethernet or USB usually, but other interfaces are available in MLAB modular system	Yes	Yes	Yes		US\$90
SDR Minor ^[76]	Pre-built	0.1 – 55 MHz		?		No	122.880 MSps ADC sampling, 48k-960k output sample rate	1/1	LAN 10/100	Yes	Yes	No		US\$199
SDR-1 ^[77]	Kit and pre-built	530 kHz – 30 MHz		?			up to 192 kHz depending on soundcard	0/1	USB	Yes	No	No		US\$200

Mein Favorit

Was kann man damit alles machen!

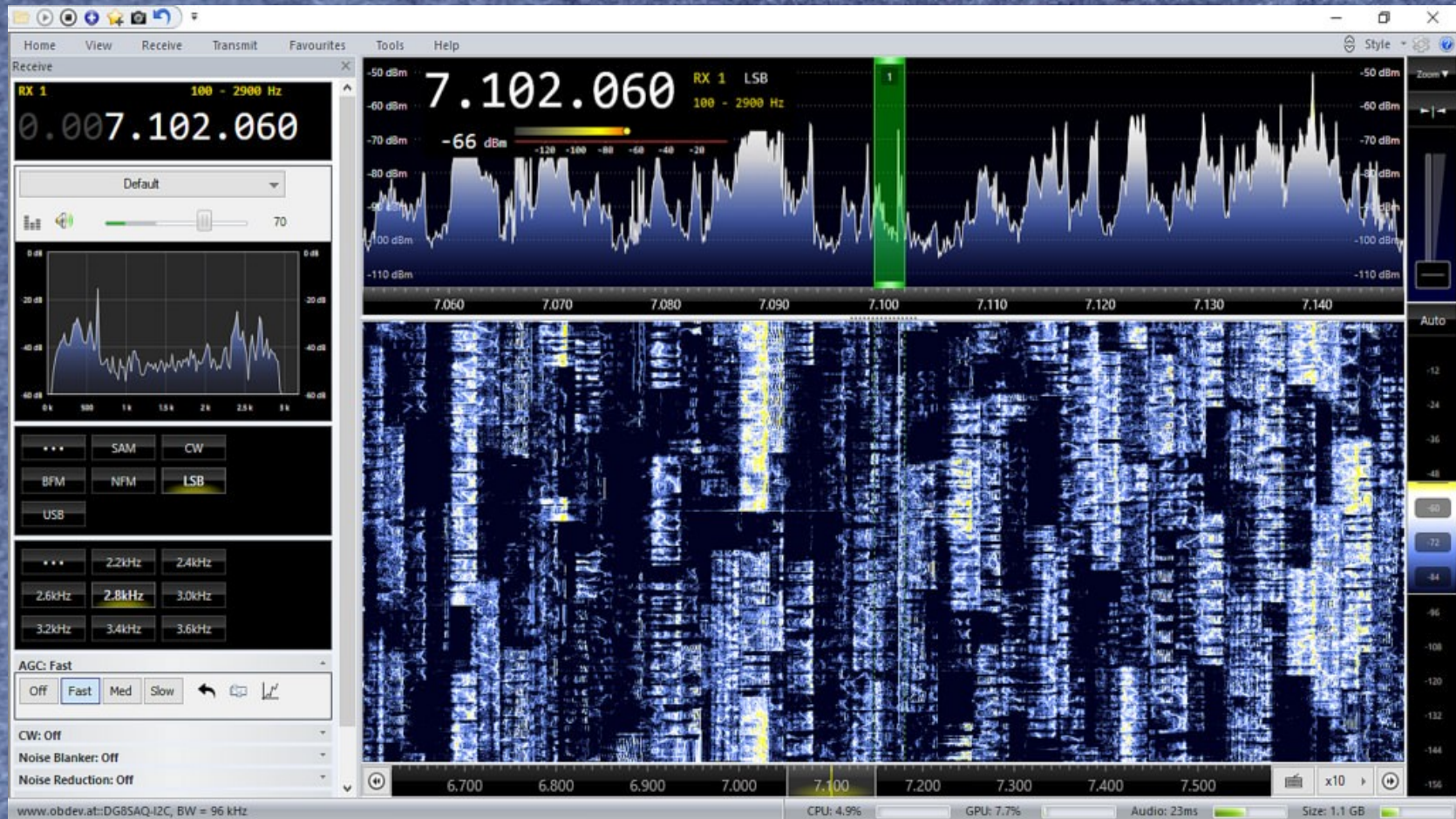
- *Empfangen in einem sehr großen Frequenzbereich*
- *Je nach Hardware von 10 khz bis 6 Ghz*
- *Je nach Hardware auch Senden im gesamten Frequenzspektrum*
- *Je nach Software alle analogen und digitalen Betriebsarten*
- *Verwendung als Messmittel*
- *z.B. als Spektrum Analyser oder Scanner*
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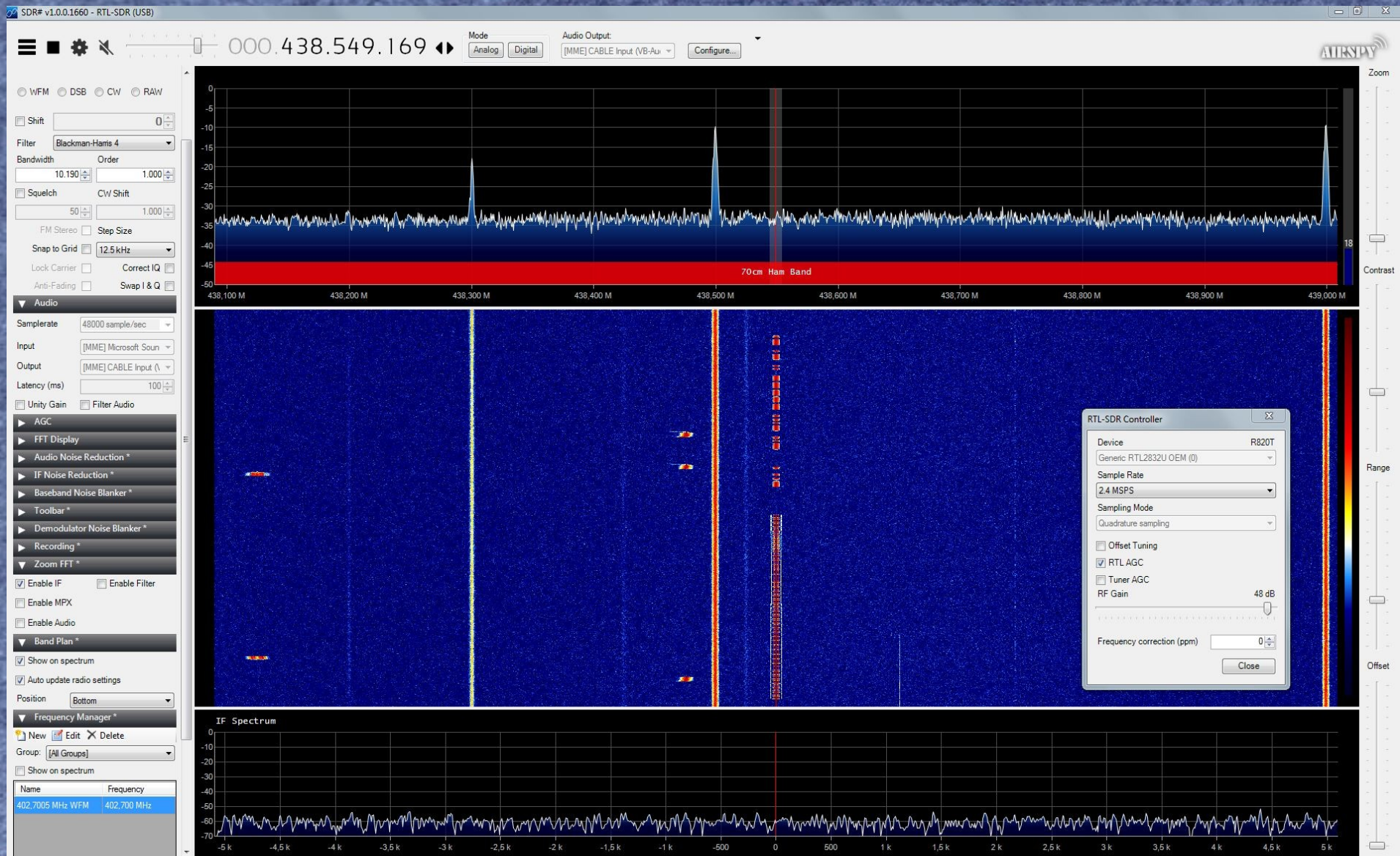
Dazu später noch etwas mehr.....

Wie verwende ich das SDR

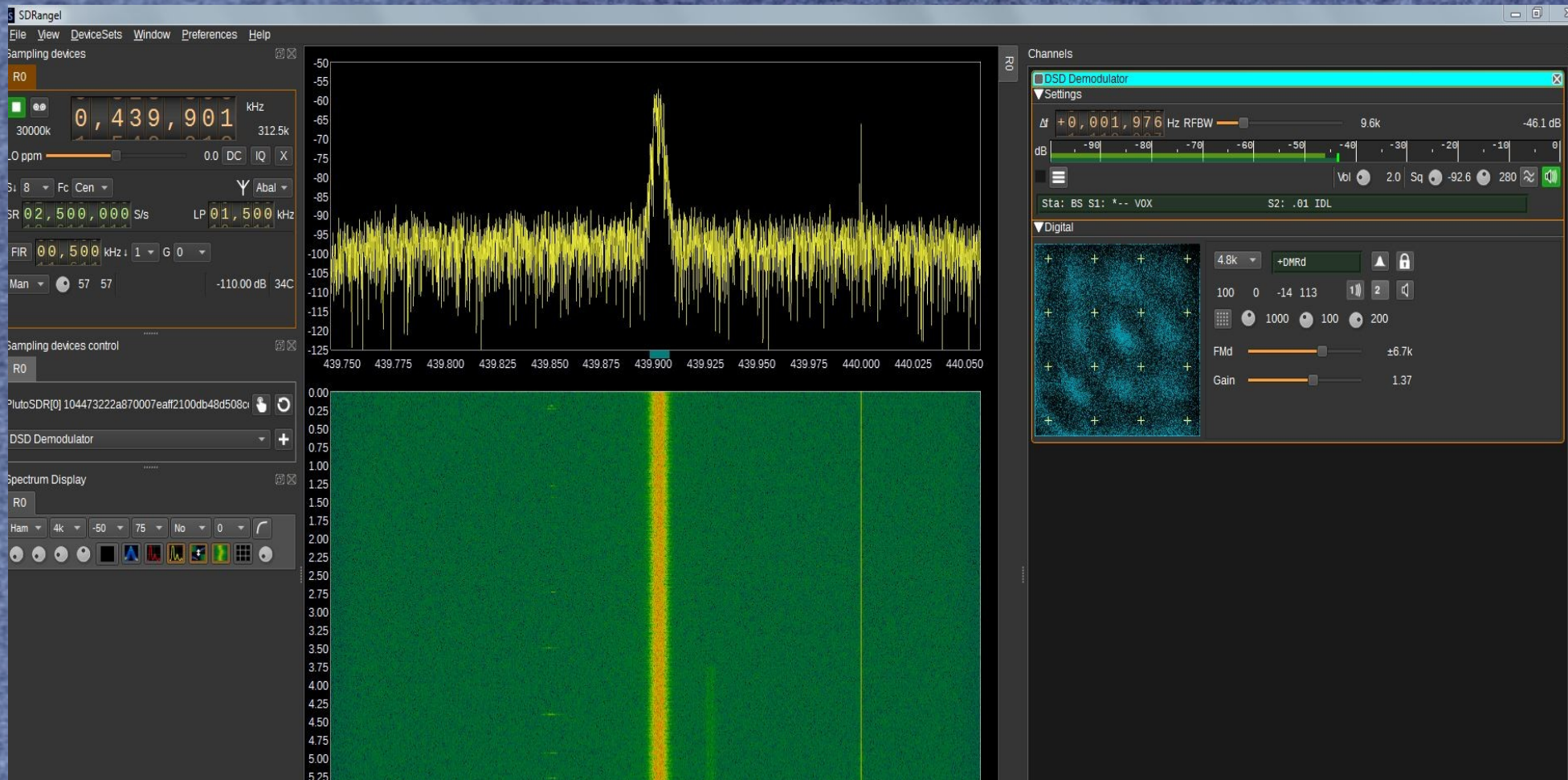
- 1. Über eine Bedienoberfläche wie
- SDR-Com (mein Favorit)



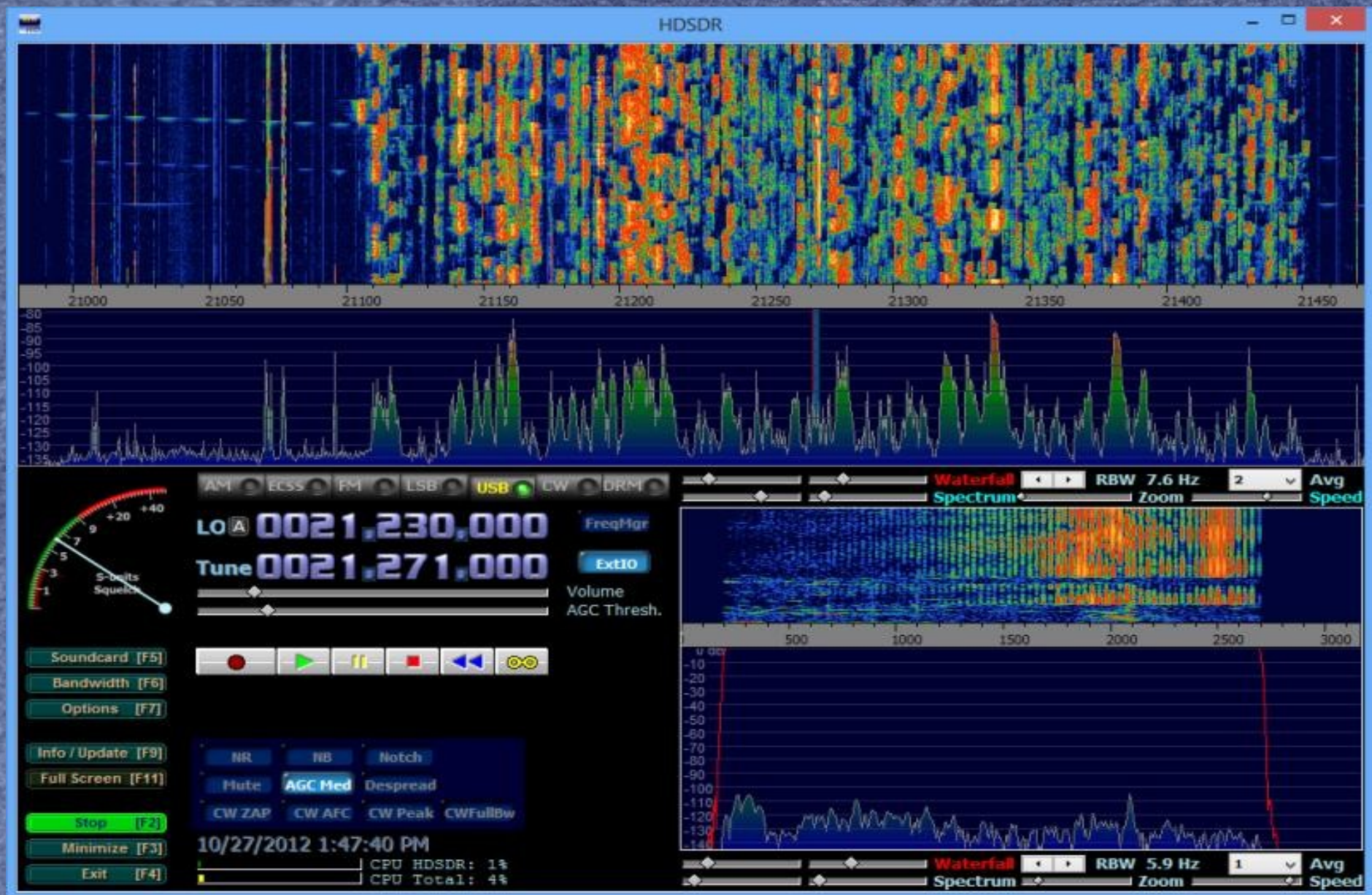
- SDR Sharp# derzeit Vers.1671
- *Einfach zu bedienen mit Inst.- Routine / viele Plugins*



- SDRAngel von F4EXB mit vielen Plugins
- Unterstützt auch Lime und Pluto SDR im Sende-
- Modus incl. DSD Modul für DMR/C4FM etc.

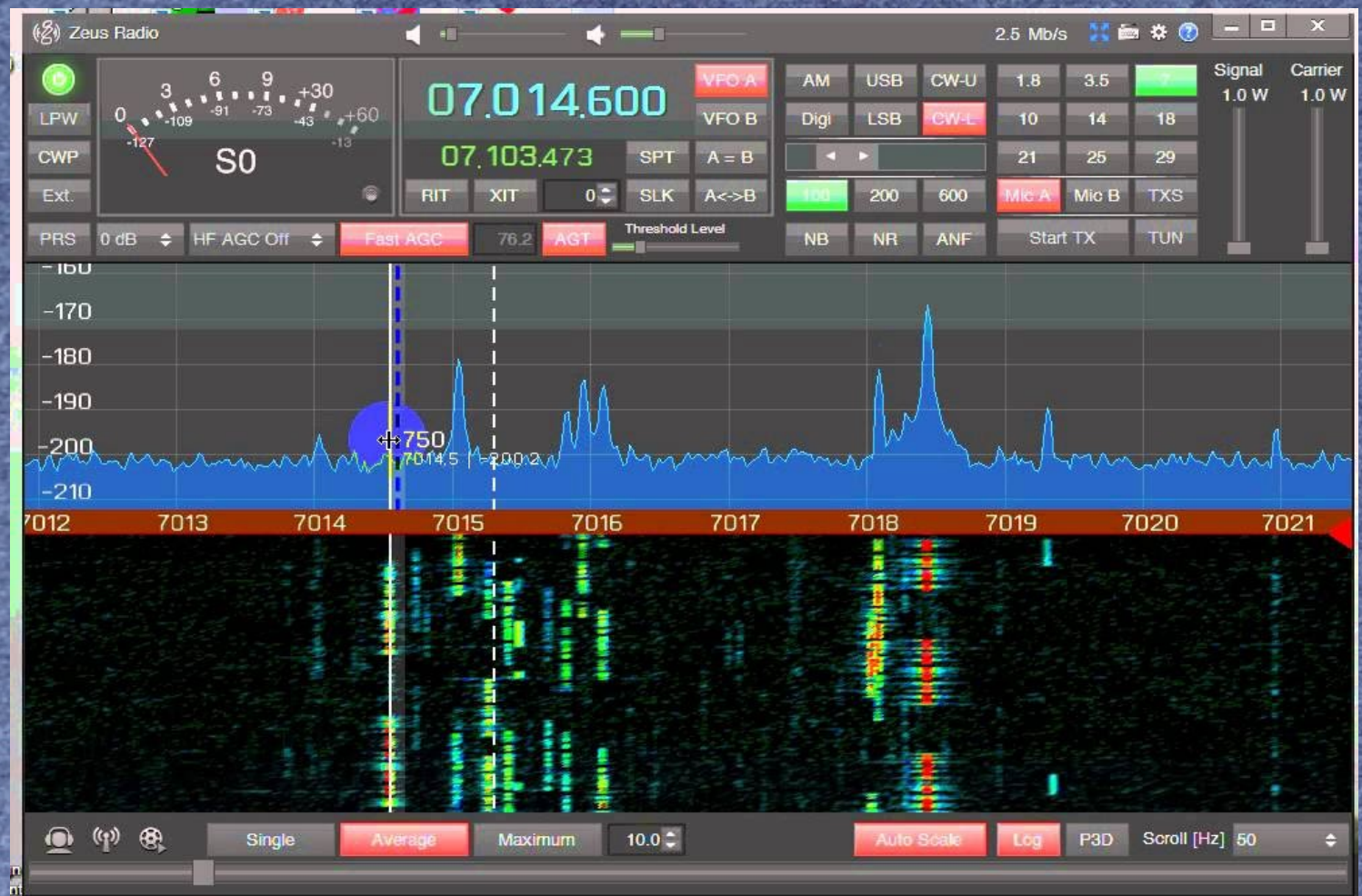


- HDSDR



Weitere zur Info

- Linrad ; SoDira ; Power SDR ; QiRx SDR (FM DAB etc.)
- GNU Radio (WIN / Linux) zum Experimentieren mit vielen Blöcken
- ZEUS Radio (New) kostet ca.30 EUR



Betrieb ohne Oberfläche, direkt Anwendung

- z.B. mit Multipsk
- Decoder oder
- rtl 433 für Funk
- Wetterstationen

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robe"
Registering protocol [59] "LaCrosse TX35DTH-IT Temperature sensor"
Registering protocol [60] "LaCrosse TX29IT Temperature sensor"
Registering protocol [61] "Vaillant calorMatic 340f Central Heating Control"
Registering protocol [62] "Fine Offset Electronics, WH25 Temperature/Humidity/Pressure Sensor"
Registering protocol [63] "Fine Offset Electronics, WH0530 Temperature/Rain Sensor"
Registering protocol [64] "IBIS beacon"
Registering protocol [65] "Oil Ultrasonic STANDARD FSK"
Registering protocol [66] "Citroen TPMS"
Registering protocol [67] "Oil Ultrasonic STANDARD ASK"
Registering protocol [68] "Thermopro TP11 Thermometer"
Registering protocol [69] "Solight TE44"
Registering protocol [70] "Wireless Smoke and Heat Detector GS 558"
Registering protocol [71] "Generic wireless motion sensor"
Registering protocol [72] "Toyota TPMS"
Registering protocol [73] "Ford TPMS"
Registering protocol [74] "Renault IPMS"
Registering protocol [75] "FT-004-B Temperature Sensor"
Registering protocol [76] "Ford Car Key"
Registering protocol [77] "Philips outdoor temperature sensor"
Registering protocol [78] "Schrader IPMS EG53MA4"
Registering protocol [79] "Nexa"
Registering protocol [80] "Thermopro TP12 Thermometer"
Registering protocol [81] "GE Color Effects"
Registering protocol [82] "X10 Security"
Registering protocol [83] "Interlogix GE UTC Security Devices"
Registered 83 out of 102 device decoding protocols
Found 1 device(s)

trying device 0: Realtek_RTL2838UHIDIR, SN: 000000001
Found Rafael Micro R820T tuner
Using device 0: Generic RTL2832U OEM
Exact sample rate is: 250000.000414 Hz
Sample rate set to 250000.
Bit detection level set to 1000.
Tuner gain set to Auto.
Reading samples in async mode...
Tuned to 433785000 Hz.
2018-08-19 15:35:05 : LaCrosse TX Sensor : 68
Temperature: 35.8 C
2018-08-19 15:35:05 : LaCrosse TX Sensor : 68
Temperature: 35.8 C
2018-08-19 15:35:06 : LaCrosse TX Sensor : 68
Temperature: 35.8 C
2018-08-19 15:35:19 : HIDEKI Wind sensor
Rolling Code: 6
Channel: 4
Battery: OK
Temperature: 43.2 C
Wind Strength: 0.00 km/h
Direction: 247.5 T
2018-08-19 15:35:19 : HIDEKI Wind sensor
Rolling Code: 6
Channel: 4
Battery: OK
Temperature: 43.2 C
Wind Strength: 0.00 km/h
Direction: 247.5 T
2018-08-19 15:35:19 : HIDEKI Wind sensor
Rolling Code: 6
Channel: 4
Battery: OK
Temperature: 43.2 C
Wind Strength: 0.00 km/h
Direction: 247.5 T

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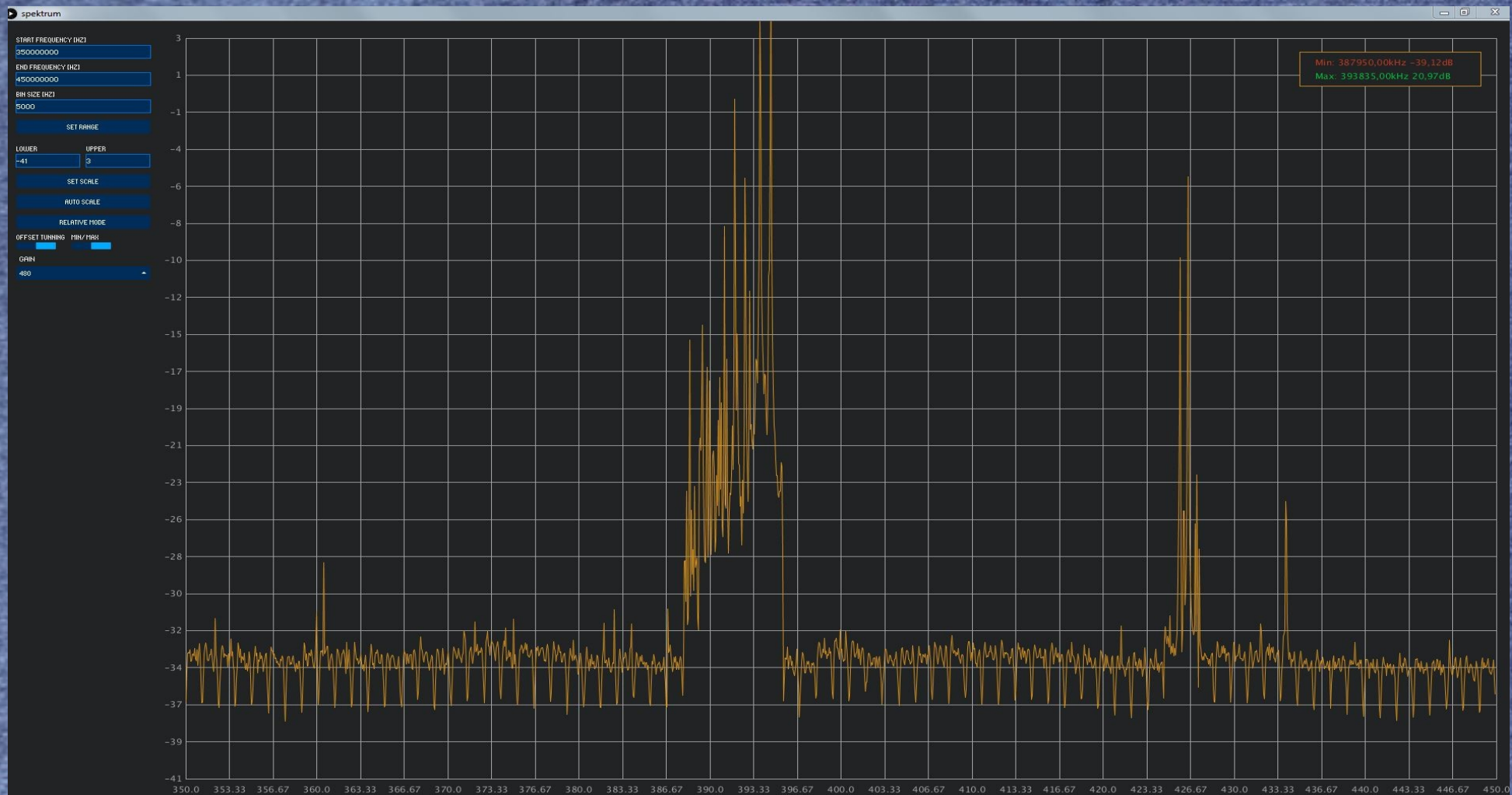

Pluto SDR mit DATV -Express

- *Digital ATV DVB-T / DVB-S / DVB-S2*
- *Bild von*
- *G4GUO*
-



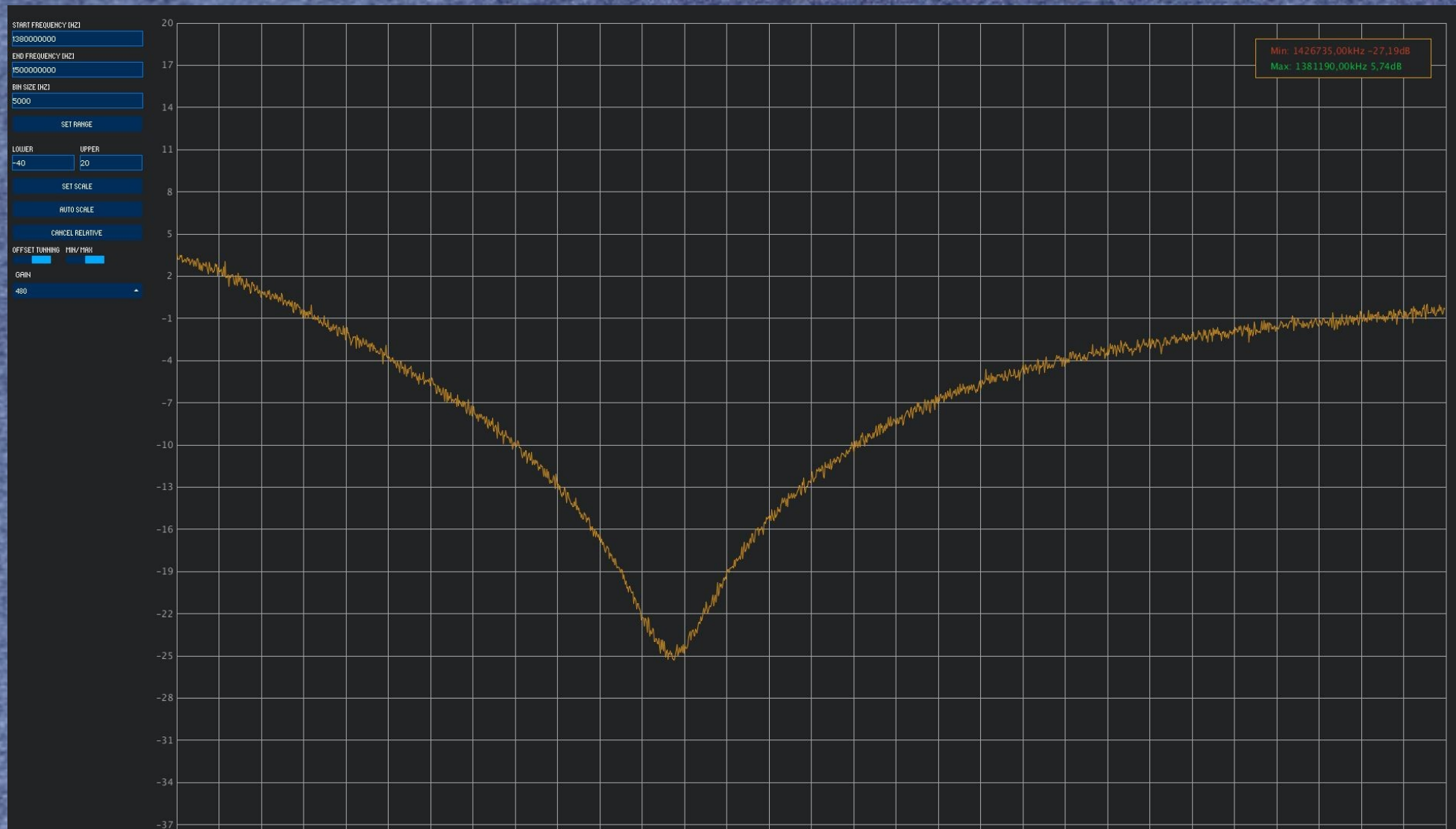
Rtl – Stick als Spectrum Analyser

- SDR's eignen sich hervorragend als Analyser
- Programme wie Touchstone oder rtl sdr Scan



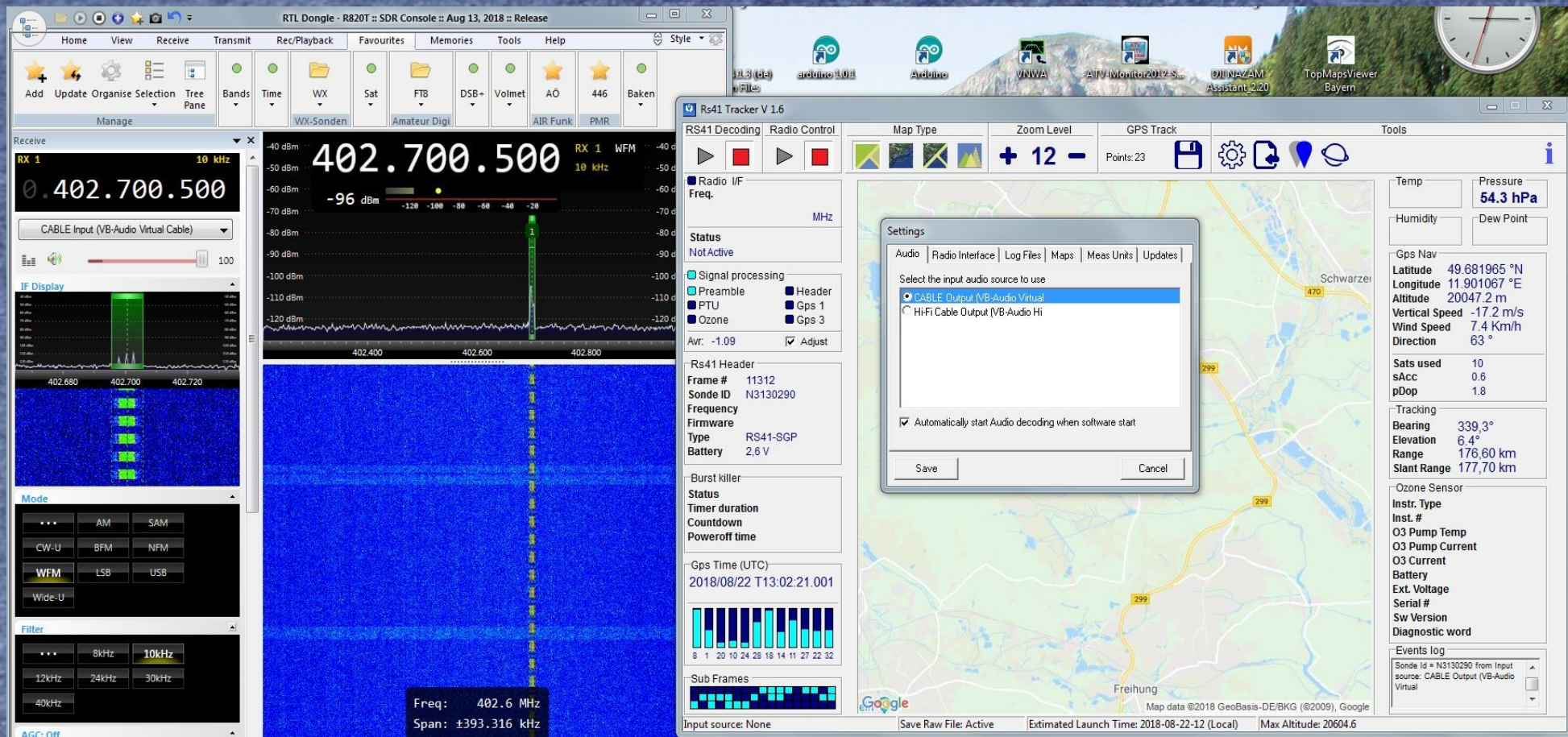
Rtl – Stick als Spectrum Analyser

- Hier ein scan meiner Sat-Patch Antenne 1,4 – 1,5 Ghz*



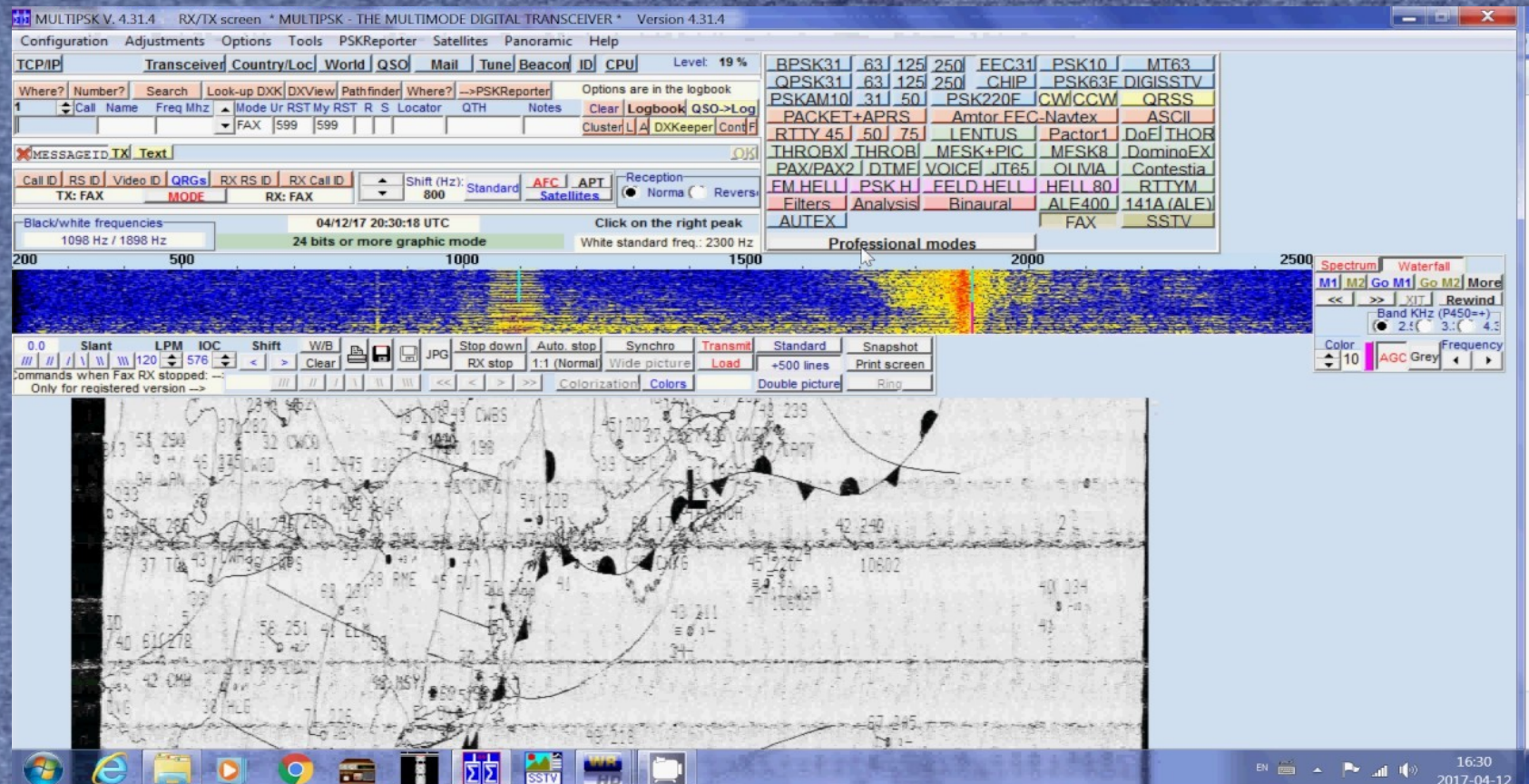
SDR mit Decoder verbinden

- Zum Arbeiten mit div. Decodern wird der NF Ausgang des SDR über ein Virtuelles Audiokabel
- auch VAC genannt mit dem Input des Decoders verbunden.



Vielfalt an Decodern

- Wir unterscheiden zwischen Multimode und Singlemode Decodern
- **Multimode Decoder** wie
- Multipsk , Fldigi, MSHV, Sorcerer, WSJT, und Sondemonitor
- verarbeiten verschiedenen Betriebsmode



- Singlemode Decoder wie
- Easypal (SSTV)
- MSSTV
- RS41 (Wettersonde)
- DSD+ DRM etc.
- WxtoImg (NOAA Wettersat.)
- Sat Decoder (Funcube etc.)
- PR Modem (G3RUH etc.)
- ADSB (Flug Decoder) (1090 Mhz)
- YADD Schiffsdecoder
- und viele mehr (Google weis (fast)alles)

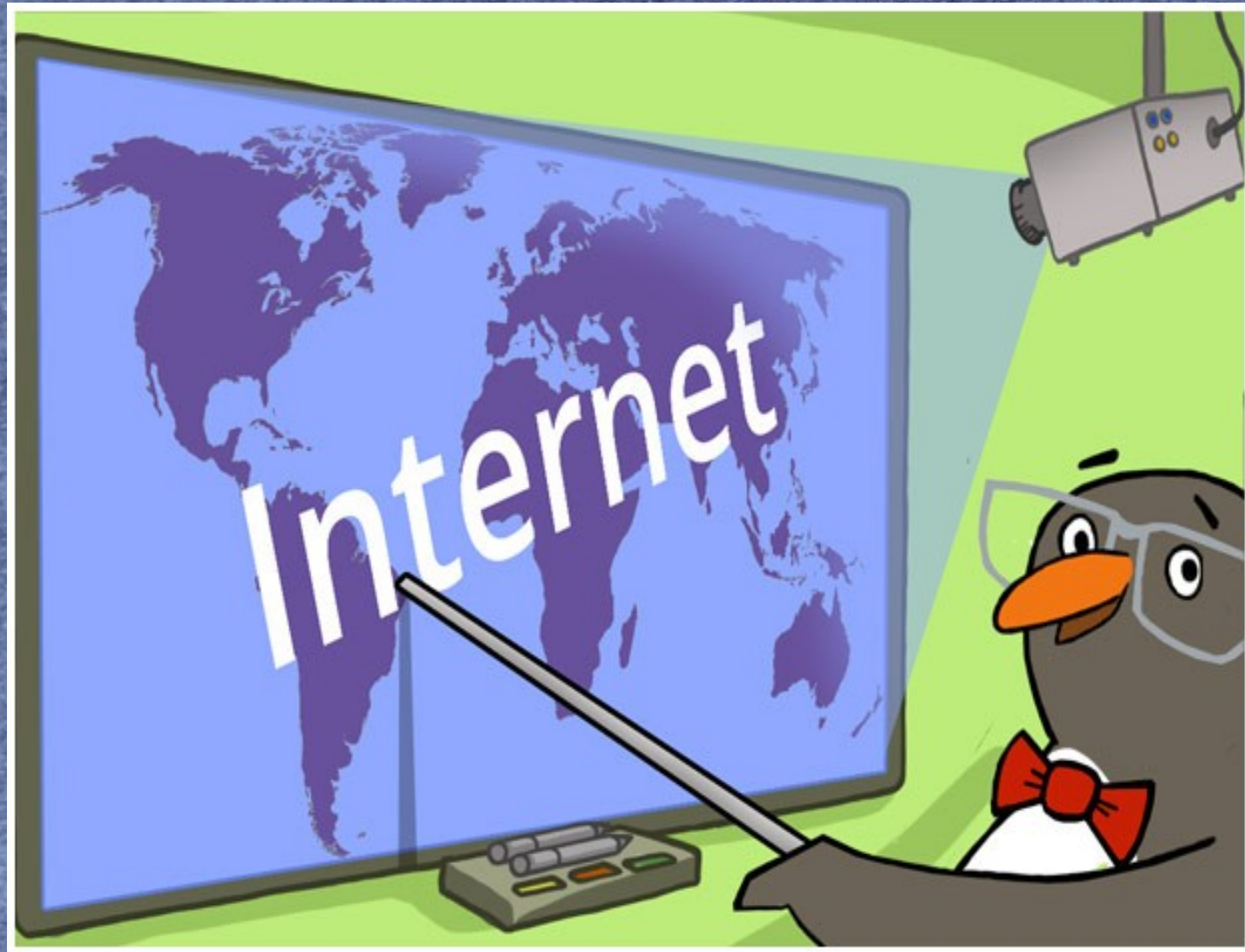
Hinweise zur Installation

- Zur Installation eines RTL2832 Sticks folgende Tipps
- Letztes Update von „ www.airspy.com“ downloaden.
- Zip Datei entpacken (z.B.mit 7.Zip)
- Danach mit eingestecktem RTL Stick (USB) die Datei
- „install-rtlsdr.bat“ starten.
- I-Net Verbindung ist Vorteilhaft.
- Die Installation läuft automatisch ab und konfiguriert die treiber.
- Diese Treiberkonfig. ist nicht nur für Sharp# sondern auch für alle anderen Oberflächen gültig.

Besten Dank für Ihre Aufmerksamkeit

- Links:<https://airspy.com/download/>
- <https://www.rtl-sdr.com/sdrsharp-plugins/>
- <https://github.com/f4exb/sdrangel/releases>
- <http://www.qsl.net/s/sdr/?C=M;O=D> „SDR Sharper“
- <https://www.sdr-radio.com/Software/Downloads>
- <http://www.hdsdr.de>
- Decoder
- <https://www.coaa.co.uk/sondemonitor.htm>
- <http://www.w1hkj.com/files/fldigi/>
- http://f6cte.free.fr/index_anglais.htm „Multipsk“
-

Noch Fragen ?



Danke de DC8GY Georg