

SI4432 UHF Generator

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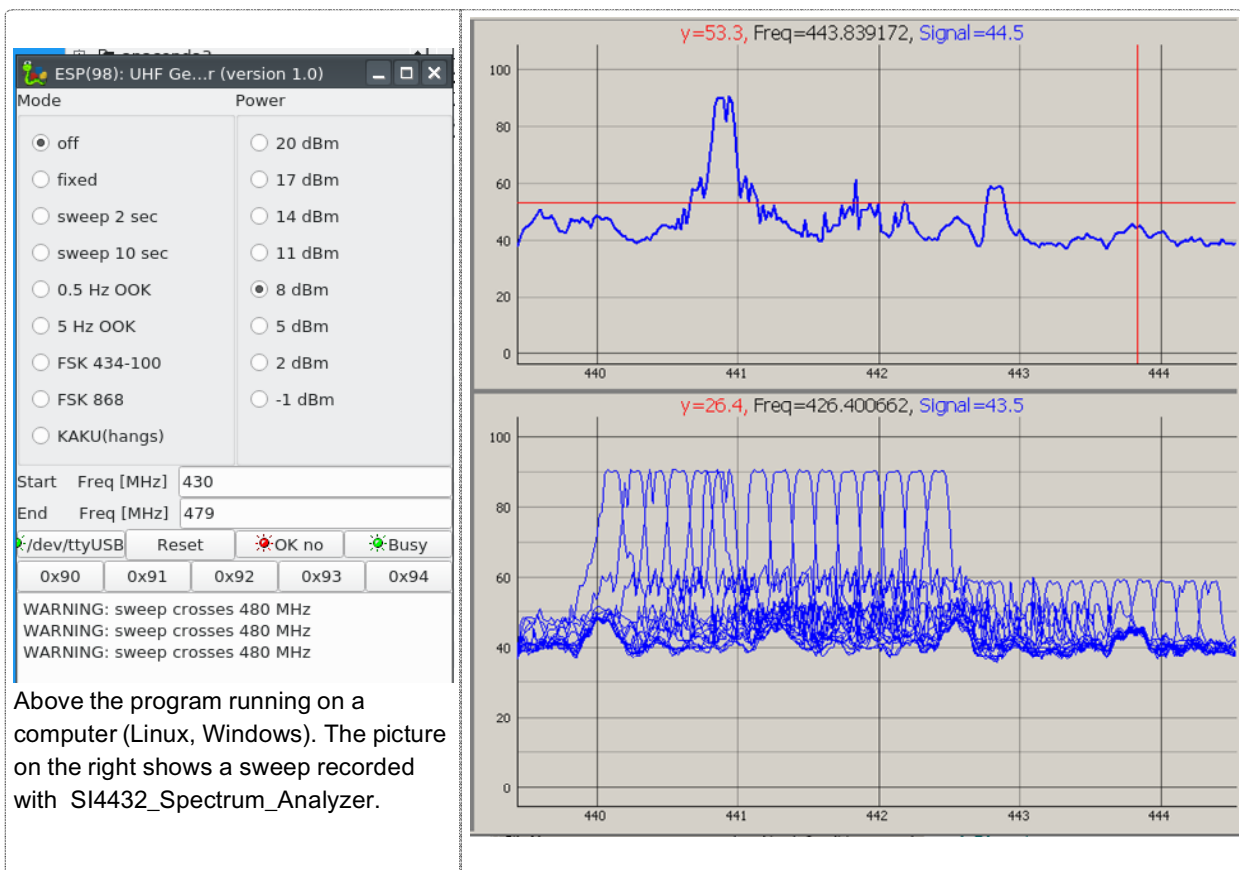
ESP: SI4432 UHF Generator

ToDo

- Title (\$\$), OK no and maybe Busy, are dependant on Data_Register, received from the ESP, this is not done correctly by the ESP or too much ather data inbetween.
- FSK modulation should be tested
- KAKU address should be set by an edit box
- F1 noet linken naar deze pagina
- Download links vermelden

Introduction

This is a simple UHF generator using a compuyter programmed in Python and the SI4432 connected to an ESP programmed in Arduino-C, which can produce frequencies from 200 ... 940 MHz and has some simple modulation modes.



Above the program running on a computer (Linux, Windows). The picture on the right shows a sweep recorded with SI4432_Spectrum_Analyzer.

After starting the program (assuming the ESP is connected), the program will automatically search for the correct CommPort and if found it will connect to that CommPort and initializes the ESP with the previous settings. If no correct ESP can be found on any of the available CommPorts, the program will exit. The green LED in the above picture on the left shows that the program is correctly connected to a CommPort and the name of the CommPort is displayed in that button.

The Busy Led on the right will light red when the program is busy (most of the times waiting for the ESP). With the OK-button you can test if the SI4432 is not in a hangup mode. If the OK-button lights red, the SI4432 is in hangup mode. Getting the SI4432 out of a hangup mode, sometimes a soft reset works (Reset button) but in general it's better to perform a hard reset by pressing the Comm-button to disconnect and connect again.

The F1-key will display this document in your own browser.

Frequency Setting

In a non-sweep mode the carrier frequency is determined by the value of the Edit box "Start Freq". After changing this value, you should press Enter-key to activate the modified frequency.

Sweep Mode

In one of the sweep modes, the frequency will slowly sweep from "Start Freq" to "End Freq" in 256 equally divided steps and then start again at "Start_Freq". Again pressing the Enter-key in one of the edit boxes will activate both the possible modified values of Start-Freq and End-Freq. One thing to realize is that the frequency range in the SI4432 is divided over 2 banks, split at 480 MHz. So if you sweep over this border (or in fact somewhat later) you'll find an instable SI4432, as shown in the picture below (this picture was recorded with the SI4432_Spectrum_Analyzer).



OOK Mode

In OOK mode the carrier frequency is switched on-off at the specified frequency. This is not an OOK-signal generated by the SI4432 itself, but it's generated by the ESP.

FSK 434-100 Mode

ToDo: describe and test

FSK 868 Mode

ToDo: describe and test

KAKU Mode

Sends each second one of the two (new) KAKU commands.

ToDo: let the user set the KAKU commands (edit box, config file ?)

Power

In fact this speaks for itself, but a warning is in its place: If your power supply is not good enough, the high power modes can easily hang up the SI4432 (see also Tips & Tricks in the general overview). Not only switching to a high power level but also other commands given to the SI4432 while it's in high power mode can hang the SI4432. See also the next paragraph.

Reset button

The Reset button can be used to reset the SI4432. If it's possible to reset the SI4432, specially when it hangs, is depending if you've connected the ShutDown pin (SDN), if not, you can forget it. When the SDN pin is not connected, the only way to reset the SI4432 is to remove the power-supply.

General purpose buttons

There are 5 general purpose buttons, which send commands with codes 0x90 .. 0x94 to the PIC. You can easily attach (test) actions in the ESP-procedure "SI4432_UHF_Generator".

0x90	0x91	0x92	0x93	0x94
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Downloads

for downloads see the general SI4432 overview **>>>ToDo**

Commands

PC	ESP	Description
AA BB C1	AA BB C1	ID handshake so the computer program can find the USB port where the ESP is connected
FA 80 ... FA 87		Set Power +20 dB Set Power -1 dB
FA 90 ... FA 94		Extra buttons 0x90 ... 0x94
FA AF xx		Set StepSize
FA B0 xx xx xx xx		Set Frequency (MSB first)
FA B1		Set Mode Off
FA B2		Set Mode Fixed
FA B3		Set Mode Sweep 2 seconds
FA B4		Set Mode Sweep 10 seconds
FA B5		Set 0.5 Hz OOK
FA B6		Set 5 Hz OOK
FA B7		Set Mode FSK 434-100
FA B8		Set Mode FSK 868
FA B9		Set KAKU MODE (hangs)
FA F0		Reset + Init
FA F2		Hangup Test