SI4432 support package

last updated, dec 2014, Stef Mientki

Introduction

This document describes the PIC-tools written in JAL and desktop programs written in Python, to control and analyze the SI4432 UHF transceiver. The module used is the 470M, which can be bought on ebay for about 3 €.

SI4432 Register Viewer

A register viewer that can compare the registers in the SI4432 (after initialization is done) with the calculated values from the (hacked) SI443x-Excel-sheet. It can also generate JAL code from the SI443x-Excel-sheet.
http://mientki.ruhosting.nl/data_www/raspberry/doc/si4432_register_viewer.html

S!4432 Interactive Viewer

Program that let's use read and write the registers of the SI4432 in an interactive way.
http://mientki.ruhosting.nl/data_www/raspberry/doc/si4432_interactive_viewer.html

SI4432 Stream Viewer

A simple stream viewer with some nice features to easily detect and decode OOK signals.
http://mientki.ruhosting.nl/data_www/raspberry/doc/stream_viewer.html

SI4432 Spectrum Analyzer

A poor mans UHF spectrum analyzer based on a PIC (programmed in JAL) and a SI4432 chip (some others might also work). The radio frequency ranges from 240 MHz to 900 MHz, stepsize can be as small as 156 Hz and sensitivity should be better than -120 dBm.
http://mientki.ruhosting.nl/data_www/raspberry/doc/spectrum_analyzer.html

SI4432 UHF Generator

Simple UHF generator creates continuous carrier, sweep frequency and very low frequency OOK.
http://mientki.ruhosting.nl/data_www/raspberry/doc/uhf_generator.html

SI4432 OOK Detection

This experiment shows that it's quiet well possible to detect raw OOK signals even without a preamble.
http://mientki.ruhosting.nl/data_www/raspberry/doc/si4432_ook_detection.html

SI4432 OOK transmitter

ToDo

SI4432 KAKU control

This document decribes test with the control of the KAKU (KlikAanKlikUit, or COCO=ClickOnClickOff) system
http://mientki.ruhosting.nl/data_www/raspberry/doc/klikaanklikuit.html

SI4432 Weather Station reader (Alecto WS-3000)

Program to receive and decode the WS3000 (and look alikes) weather station
http://mientki.ruhosting.nl/data_www/raspberry/doc/ws3000_hack.html

SI4432 Weather Station reader-2

ToDo

SI4432 Solar Panel Reading

ToDo

Tips & Tricks

- Be sure to feed the SI4432 from a good power supply and use good capacitors to decouple the power supply (especially when planning high output power). Failing to have a good power supply will randomly hang the SI4432.
- Preferable connect the Shutdown pin (SDN) to a PIC pin (instead of ground), so you'll be able to hard reset the SI4432 is cases it hangs.
- Always test new programs thoroughly at the lowest output Power, before switching the high output power mode on.
- The datasheet contains many errors, always use the formula from the hacked Excel sheet.
- LNA switch controller (register 0x6D:3) should be set to 0 if you're not using a Direct Tie application. The 470M module is not a Direct Tie implementation, but setting this bit to 1, gains about 10 dB in output power.

see also:
http://mientki.ruhosting.nl/data_www/raspberry/doc/si4432_m470_details.html

Controling 2 PICs from 1 Desktop

It's possible to handle two or more of the above programs from one desktop simultanuously. Each PIC will be connected through it's own USB connection and therfor get a different virtual CommPort. Each of the above programs remembers the last used CommPort and on startup will try that CommPort first. Knowing that, you can follow the following procedure to control two (or more) PICs from the same desktop

1. connect only the first PIC to your desktop
2. start the first program that should communicate with that first PIC
3. stop the program
4. disconnect this first PIC from your desktop
5. connect the second PIC to your desktop (it will get a different virtual CommPort)
6. start the second program that communicate with that second PIC
7. stop the program
8. connect the first PIC again to your desktop

from now on each program finds his own PIC.

Downloads

version 5:

http://mientki.ruhosting.nl/data_www/raspberry/Spectrum_Analyzer/SI4432_JAL_Python_v5.zip

Installing Python
http://mientki.ruhosting.nl/data_www/raspberry/doc/windows_install_python.html

All none standard Python libraries (for Win-32)
http://mientki.ruhosting.nl/data_www/raspberry/Spectrum_Analyzer/Python Packages Win-32.zip

Older Downloads

version 4:

http://mientki.ruhosting.nl/data_www/raspberry/Spectrum_Analyzer/SI4432_JAL_Python_v4.zip

version 3:
this is the first version that contains the UHF-Generator and contains both all JAL and all Python files

http://mientki.ruhosting.nl/data_www/raspberry/Spectrum_Analyzer/SI4432_JAL_Python_v3.zip

version 2:
JAL: http://mientki.ruhosting.nl/data_www/raspberry/Spectrum_Analyzer/SI4432_v2.zip
Python: http://mientki.ruhosting.nl/data_www/raspberry/Spectrum_Analyzer/UHF_Spectrum_Analyzer_v2.zip

version 1:
JAL: http://mientki.ruhosting.nl/data_www/raspberry/Spectrum_Analyzer/SI4432.zip
Python:
http://mientki.ruhosting.nl/data_www/raspberry/Spectrum_Analyzer/UHF_Spectrum_Analyzer.zip