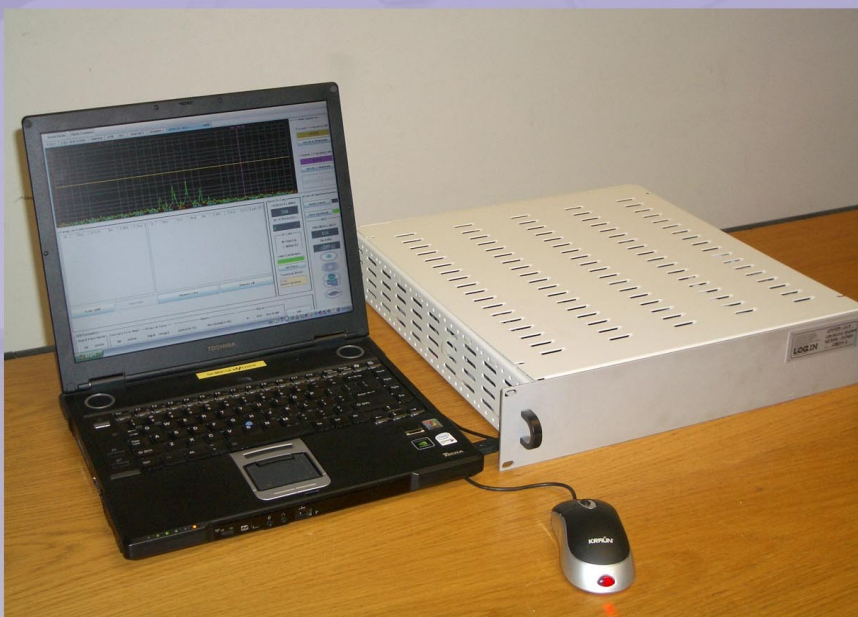


SDR '08

Washington, D.C. 26 – 30 October 2008

SCA compatible Software Defined Wideband Receiver prototype
for real time Energy Detection and Modulation Recognition

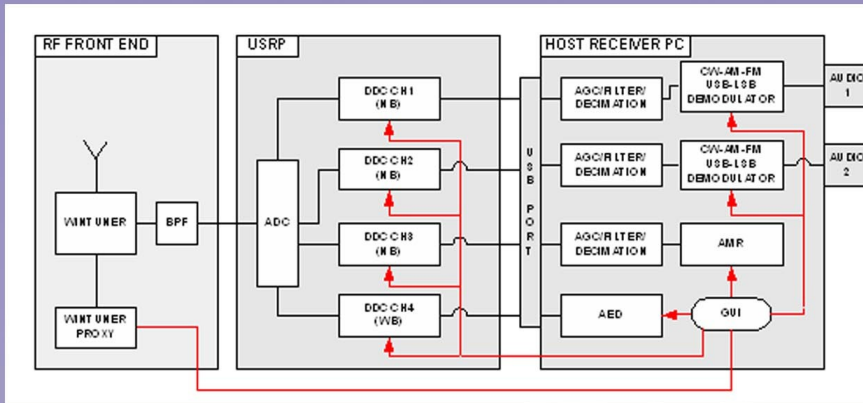


The Software Defined Wideband Receiver (SDWR) prototype was completed for a project with LOG.IN and the Communication Research Centre of Canada (CRC).

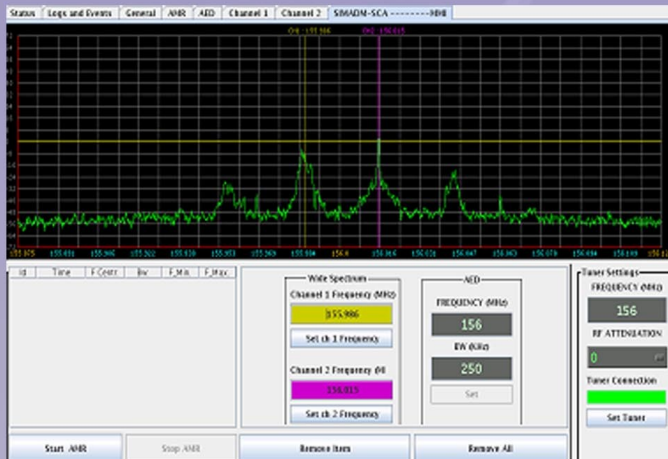
The Software Defined Wideband Receiver (SDWR) prototype consists of Off The Shelf basic hardware components and a sophisticated software component.

The SDWR is designed to detect and recognize an RF signal using Automatic Energy Detection (AED) and Automatic Modulation Recognition (AMR) software algorithms, in conjunction with common SCA compliant waveforms. The AED operates a real-time, blind wideband search of the electromagnetic energy, whereas the AMR identifies the parameters of a specific detected energy.

The hardware includes a WiNRADiO Tuner front end with an Ettus Inc. USRP device connected to a COTS laptop computer. The radio controller and waveforms are all developed in software using the CRC SCARI ++ Suite and wrapping the AED and AMR resources for SCA compatibility.



SDWR – Schematic block diagram



SDWR – Example of MMI

MAIN FEATURES

- Developed in software using the CRC SCARI ++ Suite
- Conforming to SCA - Rev.2.2
- Based on COTS devices:
 - RF front end: - Winradio Tuner WR-G526e
 - DDC: - Ettus Inc URSP module
 - Host Computer: - Laptop PC – Pentium IV – 2.8 GHz
- Operating System: Linux
- GUI: Java based
- Frequency range: 20 MHz – 3 GHz
- Analog IF (Tuner output): 21.4 MHz – BW (3dB) 16 MHz
- Channeling:
 - n.2 NB (25 KHz) channels (CW-AM-FM-LSB-USB demodulator)
 - n.1 NB (25 KHz) channel for AMR
 - n.1 WB (>250 KHz) channel for AED
- Algorithms for :
 - Automatic Energy Detection (AED)
 - Automatic Modulation Recognition (AMR) (CW, AM, FM, H3E±, J3E±, M-FSK, M-PSK)