RADAR Signal Acquisition, Conditioning and Processing System

RADAR SACPS

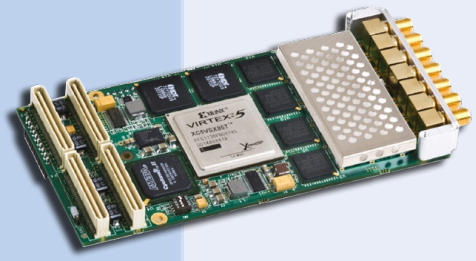
RADAR Signal Acquisition, Conditioning and Processing System (RADAR SACPS) acquires atmospheric RADAR return signals at 206.5 MHz. It performs signal processing and extraction of Wind parameters such as Wind speed, Wind direction and Wind velocity. It involves Online and Offline signal processing.

- Online Processing System involves
  - Decoding and Coherent Integration
- Offline Processing System involves
  - Normalization, Windowing, Fourier analysis, Power spectrum analysis, Incoherent Averaging, Spectrum cleaning, Noise level estimation, Moments calculations, UVW and Wind parameters calculations.

ICS1554 PCI-X is used for real time signal acquisition and conditioning. Offline Signal Processing of real time data is performed under Linux platform.

Salient Features

- FPGA based Decoding using Bi-phase Complementary Code and Coherent Integration
- Fast Fourier Transform up to 1024 with frequency resolution of up to 0.1 Hz.
- Front panel allows different parameter selections like number of Beams, Scan Cycles, Coherent Integration, FFT points, Spectral Averaging and PRF, Pulse Width, Coding & Decoding etc., based on atmospheric turbulence for processing different types of signals.
- IQ and spectrum data are stored using NETCDF file format.
- Provision to analyze NETCDF file format and NARL files, using Offline signal processing.
- GUI displays 1, 3 and 5 beams for following parameters viz.
  - In-phase and Quadrature data
  - Power spectrums
  - Signal trace
  - Moments (i.e. 0^{th} Moment, 1^{st} Moment and 2^{nd} Moment)
  - UVW components
  - Wind parameters such as wind speed, wind direction, wind velocity.



Note : The Specifications can be changed without prior notice due to technological advances

INNOVATION COMMUNICATIONS SYSTEMS LTD

(an ISO 9001-2008 Company)

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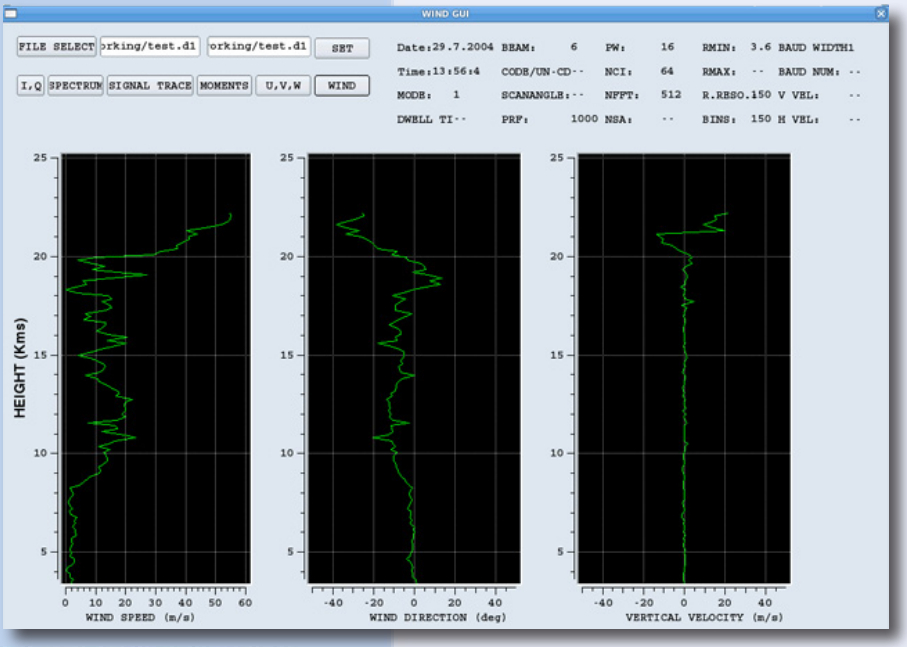
RADAR SACPS

System Specifications

• Input frequency	: 206.5 MHz
• Input level	: -50 to 0 dBm with 50 ohm impedance.
• Clock	: LVTTL, 72 MHz, 0 dBm, sine wave.
• Trigger	: LVTTL, 3.3V.
• Wind Vector Determination	: Doppler beam swinging.
• Number of beam	: 1, 3, 5.
• Number of scan cycles	: 1 to 5.
• Pulse Repetition Frequency (Hz)	: 250, 500, 1000, 2000, 4000, 8000
• Pulse width (µs)	: 2, 4, 8,16,32,64.
• Pulse decoding	: Bi-phase complementary code.
• Number of coherent integration	: 1 to 76.
• Number of FFT points	: 256 to 1024.
• Number of spectral averaging	: 1 to 10.
• Plots	: IQ data, Frequency spectrum, signal trace, Moments, and UVW Components, wind speed, wind direction and wind velocity.
• File Format	: NETCDF (Network Common Data Format)
• Operating system	: Linux 2.6.23 Fedora 8 (64 bit).
• Environment	: Qt-4.3.4 and Qwt-5.2.1.
• Power Supply	: 230V AC, Single Phase, 50 Hz.



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