

# FMCW Signal Analyzer



## Overview

The FMCW Signal Analyzer is a software designed to measure, display and log the parameters of the FMCW signals, mostly used in FMCW RADARs. The software allows to perform real-time demodulation of the signals with up to 1GHz of bandwidth, measure the key parameters of the demodulated signal, as well as perform time-domain and frequency-domain measurements on the received signal.

The graphs used for visualization show the spectrum, spectrogram and the power of the signal over time, as well as the demodulated signal. The software allows to analyze the signals not only in real-time, but also record the signals and perform offline processing for deeper analysis of the different sections of the signal.

The results of the measurements on the demodulated data are displayed on a table and can be exported into a tab-delimited file. The embedded algorithms automatically detect the type of the FMCW chirp (rising chirp, falling chirp, triangle chirp or a CW tone) and measure key parameters such as deviation, chirp period and chirp linearity.

## Hardware and Software

- PXIe-8880 controller
- PXIe-5840 VST
- NI-RFSA Driver 15.0 or later

## Measurements

- Chirp analysis (FM demodulated signal)
- Chirp number
- Chirp ID (1-rising, 2-falling, 3-triangle, 0-CW)
- Chirp start
- Chirp end
- Chirp duration
- Frequency start
- Frequency end
- Deviation
- Chirp rate
- Mean deviation (mean deviation for a particular section of the signal )
- RMS deviation (RMS deviation of chirp frequency from an ideal linear frequency trajectory)
- Max deviation (max deviation of chirp frequency from an ideal linear frequency trajectory)
- Average deviation (average deviation of chirp frequency from an ideal linear frequency trajectory)
- Average chirp frequency (with respect to center of the chirp)

