Signal Processing Component Library for .NET

Rapid Development of Signal Processing Applications

The Signal Processing Component Library for .NET contains a comprehensive set of .NET components ideal for developing signal processing applications. Each component contains properties and methods that can be used to perform single-channel and two-channel FFT operations, and to calculate signal metrics on time-domain data. The open design architecture allows hardware-independent support. This component library requires a single developer license; the dll can be distributed royalty-free.
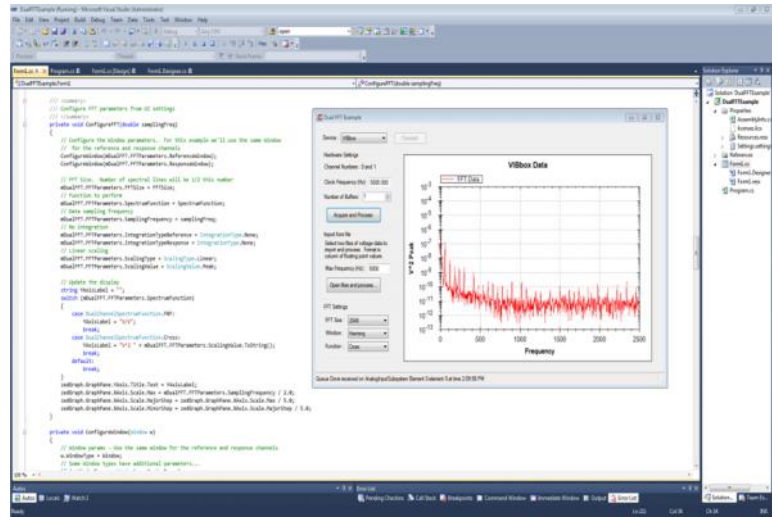

Figure 1. The Signal Processing Component Library for .NET is perfect for developing signal processing applications for the sound and vibration marketplace. The dll can be distributed royalty-free.

Key Features

- **Hardware independent** – use measurement data from any device
- **Royalty-free** distribution of the dll
- **Single-Channel FFT Operations:**
    - Spectrum
    - Auto-Spectrum
    - Power Spectral Density (PSD)
- **Two-Channel FFT Operations:**
    - Frequency Response Functions (FRF): Inertance, Mobility, Compliance, Apparent Mass, Impedance, Dynamic Stiffness, Custom with H1, H2, or H3 estimators
    - Cross Spectrum Functions: Cross Spectrum, Cross Power Spectral Density (Cross PSD)
- **Windowing Types:**
    - Rectangular
    - Hamming
    - Hanning
    - Blackman
    - Blackman Harris
    - Bartlett
    - Exponential
    - Flat Top
    - Cosine Taper
    - Force

- **Scaling Types** (db, Linear) and Scaling Values (Peak, Peak-Peak, RMS)
- **Integration Types** (None for Acceleration, Single for Velocity, Double for Displacement)
- **Signal Metrics:**
    - Input Below Full-Scale (IBF)
    - Total Harmonic Distortion (THD)
    - Signal-to-Noise Ratio (SNR)
    - Signal-to-Noise and Distortion (SINAD)
    - Spurious Free Dynamic Range (SFDR)
    - Effective Number of Bits (ENOB)

Ordering Summary

- **SP8075-KEY** – Signal Processing Component Library for .NET
    - Developer license with royalty-free distribution

A 14-day free trial can be downloaded at:
http://www.datatranslation.com/products/test-and-measurement-software/Signal-Processing-Library/default.asp

The Signal Processing Component Library for .NET is a native .NET set of components, listed in Table 1, for programming single and dual-channel FFT operations and/or operations that return signal metrics in Visual C# and Visual Basic .NET. These components provide properties and methods that you can access programmatically through .NET classes.

The component library is supported under Windows XP (32-bit), Windows Vista (32-bit and 64-bit), Windows 7 (32-bit and 64-bit), and Windows 8 (32-bit and 64-bit), using Visual Studio 2005 to 2012 and .NET Framework 2.0 to 4.5.

Table 1. Components in the Signal Processing Library for .NET

Components	Classes	Description
SingleChannelFFT Performs Single-Channel FFT Operations	FFTParamsSingle	Provides the properties and methods for setting up the required parameters, such as the spectrum function, integration type, windowing functions, phase noise threshold, scaling type, scaling value, and so on, when performing a single-channel FFT operation.
	SingleChannelFFT	Provides the properties and methods for performing a single-channel FFT operation.
	FFTResultsSingle	Contains the result of a single FFT operation.
DualChannelFFT Performs Two-Channel FFT Operations	FFTParamsDual	Provides the properties and methods for setting up the required parameters, such as the reference and response windowing functions, reference and response integration types, FRF mode, FRF estimator, coherence function, cross spectrum function, and so on, when performing a two-channel FFT operation.
	DualChannelFFT	Provides the properties and methods for performing two-channel FFT operations.
	FFTResultsDual	Contains the result of a two-channel FFT operation.
SignalMetrics Computes Signal Metrics	SignalMetrics	Provides the properties and methods for calculating signal metrics (IBF, THD, SFDR, SINAD, ENOB, and SNR) for the time-domain data.
	SignalMetricsResult	Contains the metrics that were calculated using the SignalMetrics class.
	SignalProcessingException	Provides properties, fields, and methods for handling exceptions when calculating signal metrics.

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