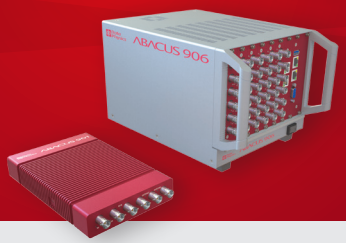
Data Physics



900 Series Software
SignalCalc®

Channel and Signal Math

DP930-80

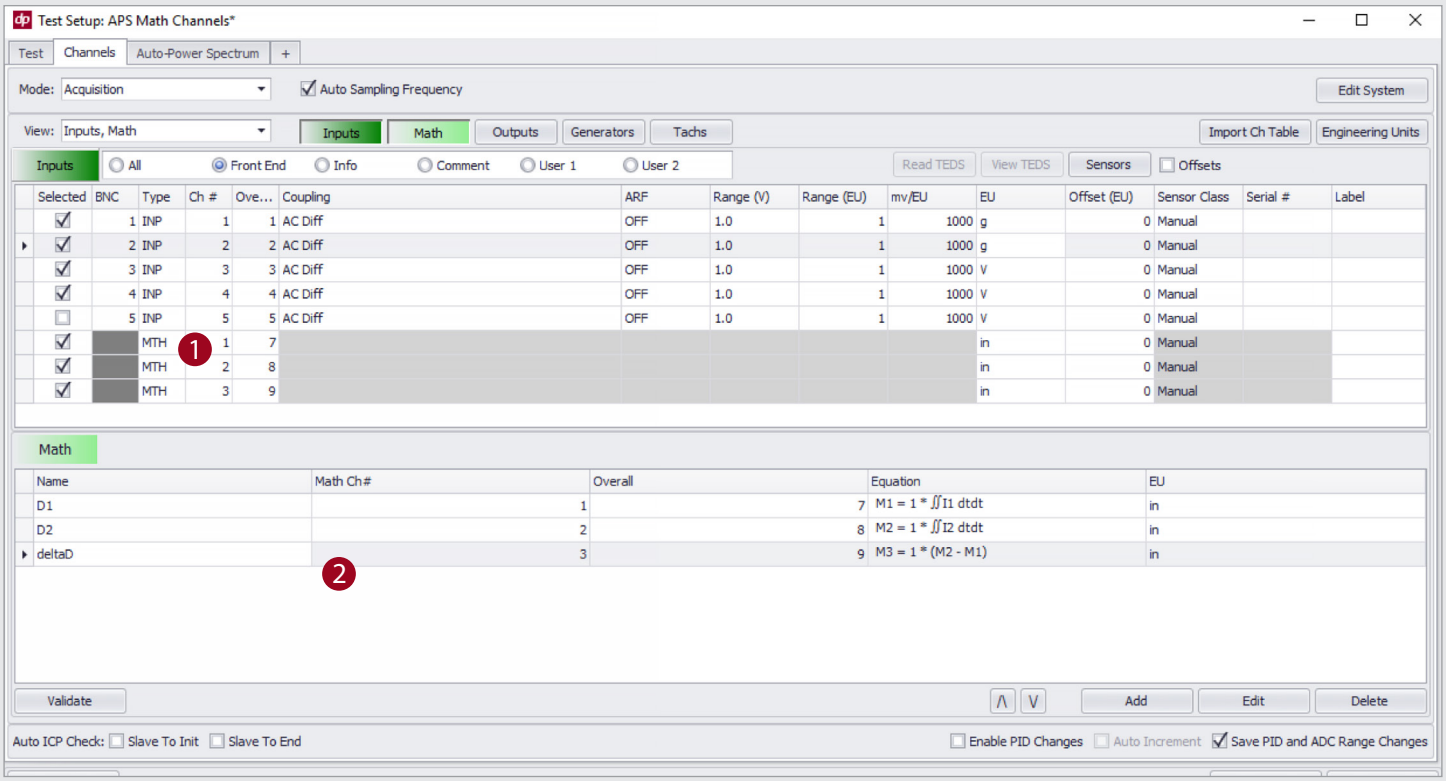
The Channel and Signal Math option adds the ability to create virtual channels (channel math) or user-defined functions (signal math). Channel and Signal Math enables user-defined signal processing to streamline the testing and analysis process. All math processing is done in realtime during control and analysis in the 900 Series hardware. Virtual channels can be processed by built-in signal processing functions and used as control or limit channels in vibration control applications. Math operations include:

Feature	Operations
Channel Math	
Simple Operator	
A + Stream	Add scalar value to any input channel data
A * Stream	Multiply any input channel by a scalar value
Stream / A	Divide an input channel by a scalar value
A * (Strm1 + Strm2 + …StrmN)	Add input channels and multiply by a scalar value
A * (Strm1 - Strm2)	Subtract an input channel from another and multiply by a scalar value
A * (Strm1 * Strm2 * …StrmN)	Multiply input channels and multiply by a scalar value
A * (Strm1 / Strm2)	Divide input channels and multiply by a scalar value
(Strm1 + Strm2 + …StrmN)/N	Average input channels
A1*Strm1 + A2*Strm2 + …AN*StrmN	Multiply each input channel by a scalar value and sum
A * ∫Strm dt	Integrate channel and multiply by scalar value
A * ∫∫Strm dtdt	Double integrate channel and multiply by scalar value
A * d Strm/dt	Derivative of input channel and multiply by a scalar value
A * d^2 Strm/dt^2	Second derivative of input channel and multiply by a scalar value
LPF(Strm)	Apply low pass filter to input channel
HPF(Strm)	Apply high pass filter to input channel
BPF(Strm)	Apply band pass filter to input channel
Notch(Strm)	Apply notch filter to input channel
Matrix Operations	
User-defined	Manual entry of transformation matrix to create virtual channels for input channels
Kinematic Transformation	Automatic computation of up to six rigid body degrees of freedom from sensor locations and directions in the channel table
Signal Math	
Simple Operator	
A + Sig	Add scalar value to any signal
A * Sig	Multiply any signal by a scalar value
Sig / A	Divide a signal by a scalar value
A * (Sig1 + Sig2 + …SigN)	Add signals and multiply by a scalar value
A * (Sig1 - Sig2)	Subtract Signals and multiply by a scalar value
A * (Sig1 * Sig2 * …SigN)	Multiply Signals and multiply by a scalar value
A * (Sig1 / Sig2)	Divide Signals and multiply by a scalar value
A * Window(Sig)	Apply a window to a Signal
(Sig1 + Sig2 + …SigN) / N	Average Signals
A * FFT(Sig)	Multiply the FFT of a Signal by a scalar value
A * iFFT(Sig)	Multiply the inverse FFT of a Signal by a scalar value
A * CFFT(Sig)	Multiply the Complex FFT of a Signal by a scalar value
A * iCFFT(Sig)	Multiply the inverse Complex FFT of a Signal by a scalar value
A1*Sig1 + A2*Sig2 + …AN*SigN	Multiply each Signal by a scalar value and sum

Data Physics

900 Series Software
SignalCalc®

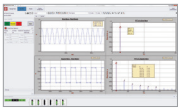
Simple Creation of Complex Math Operations



1 Math Channels
Math channels appear in setups, graphs, and data with physical channels. All related signal processing for the measurement or control are also performed on Math Channels.

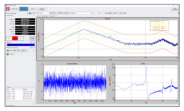
2 Combine Math Operations
Use multiple math operations in a single function to build virtual channels.

Related Applications



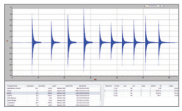
FFT Analysis
DP930-10

Acquire and analyze data using auto and cross spectrum, transfer function, auto and cross correlation, histogram, and synchronous averaging



Random Vibration Control
DP960-10

Control a shaker to reproduce a specific vibration environment described by a power spectral density (PSD) profile



Recording and Playback Analysis
DP930-23

Record data up to 200 k samples/ second simultaneously with real-time measurement or control

NOTE: Continued product improvement necessitates that Data Physics reserves the right to modify these specifications without notice.