



EDM-DSA & EDM-PA 9.0

Engineering Data Management Software Release Notes

SPIDER DYNAMIC SIGNAL ANALYSIS (DSA)
POST ANALYZER (PA)



TABLE OF CONTENTS

RELEASE HIGHLIGHTS	4
Introducing Spider Systems Featuring 256 kHz Sampling Rate (Spider-80Hi and Spider-80Ci)	4
• Vibration Control System or Dynamic Signal Analysis	4
• Spider-80Ci (Integrated Charge Amplifiers)	4
• High Channel Count System	4
• Time Synchronization	4
Introducing the Ultra-Compact Spider-20H, Spider-HE & Spider-20i with 256 kHz Sampling Rate	4
• Spider-20H (Wi-Fi)	4
• Spider-20HE	4
• Spider-20i	4
• Extended Input Range	5
• High Channel Count Synchronized Data Acquisition	5
Synchronized Data Acquisition Between Spider-20E and Spider-80X/Spider-80Xi Systems	5
Support for Strain-gage Based Sensors on Spider-80SG or Spider-80SGi	5
Save and Continue an Unfinished Test	5
Introducing Statistics Signals in EDM-DSA	6
Introducing Frequency Domain Signals in Variable Sampling Rate	6
Introducing Time Markers for Raw Time Recording Data	6
Support for Microsoft SQL Server 2017 and 2019	7
Ease of Connecting IEPE Sensors with Spider-80SGi	7
New Features in EDM Dynamic Signal Analysis	7
• Adjustable X-axis Range for Live Time Stream Display	7
• Variable Sampling Rate Allows Selection of Higher Sampling Rates	8
• Offset Nulling is Available in Event Action Rules	8
• Customizable Reference in X-axis in Spectral Signals	9
• Attach Limiting Results to Run Folders	9
• DSA-SRS Reference Profile Includes Alarm and Abort	9
New Features in Post Analyzer	10
• Standard Deviation Added to Statistics Signals in PA	10
• Recording and Saving Simultaneously	10
• Option to Choose Acquired Time or Processed Time for Saved Signals	10
• Data Conditioning Module Added to Project Template	10
New General Features	11
• Ease of Adding Modules to Tests or Switching Tests Between Spider Systems of Different Channel Counts	11
• Channel Status and Measurement Status Added to Saved Signals and Report	11
• Introducing Advanced RTD Non-Linearity Correction for Accurate Temperature Measurements	12
• Real Time Signal Averaging Tool	12
• Simultaneously Configure All Strain Gage Input Channel Parameters	12
• Customizable Rate for Statistics Time History Signals	12
• Addition of Measurement Point, Coordinates and DOF to Input Channel Table	13
• Export to Multiple Excel Files	13
Major Improvements	13
EDM Dynamic Signal Analysis	13
• Indefinite Peak Hold Spectrum	13
• Improvements to Pre-Trigger Parameters Display	13
• Orbit Plot Supports Display of Non-displacement Signals	13
General Improvements	14
• Conveniently Configure and Review Recording Destination	14
• Out of Band Overload Detection on Front-end LEDs	14

• Enhanced History Review for Time History Signals.....	14
• Introducing Overall RMS Display for All Signals in the Plot.....	15
• Improvements to “Export to Single File”.....	15
• Customizable Line Width for Signals in Report.....	15
• Enhanced Calibration Notification for Strain Gage Calibration.....	15
• Enhanced Calibration Review Window for Strain Gage Calibration.....	15
• Improved Text Display for Signals with Phase (FFT/FRF/CPS).....	16
• Enable Multiple Charts of SRS Reference Profiles.....	16
• Ability to Disable Certain Notifications in EDM.....	16
• Customizable Font Size of Marker Text in EDM Display and Report.....	16
• Expanded Details in Event Action Rules.....	17
• Support to TEAC – TAFFmat Data Format.....	17
• Improved PC Resources Check.....	17
• Share Global Settings with Systems on LAN.....	17
• Improved Signal Color Setting for Saved Signals and Live Signals.....	17
Software Release History.....	18
System Requirements.....	18
Minimum System Requirements:.....	18
Recommended System Requirements (Minimum for Spider Systems Higher than 16 Channels):.....	18
Version Compatibility.....	18

RELEASE HIGHLIGHTS

Introducing Spider Systems Featuring 256 kHz Sampling Rate (Spider-80Hi and Spider-80Ci)

The Spider-80Hi and Spider-80Ci are the newest and the most powerful front-end cards of the Spider 80Xi platform. These cards are equipped with sampling rates of up to 256 kHz.

The Spider-80Hi is similarly equipped as the Spider-80Xi system with dual ADC technology which provides a dynamic range of 160 dB and 58 stages of a sampling rate selection ranging from as low as 0.48 Hz to as high as 256 kHz.



Raw time data can record continuously at the 256 kHz sampling rate for all channels. The Spider-80Hi has the same form factor as the Spider-80Xi platform and can be used with a Spider-80Xi chassis or Spider-80M chassis.

Vibration Control System or Dynamic Signal Analysis

The Spider-80Hi and Spider-80Ci are equipped with synchronized output channels that enable these devices to be used as vibration control systems or for dynamic signal analysis applications.

Spider-80Ci (Integrated Charge Amplifiers)

The Spider-80Ci has integrated charge amplifiers in addition to all the features supported by the Spider-80Hi.

High Channel Count System

Multiple Spider-80Hi and Spider-80Ci front-ends can combine to create a high channel count system with up to 1024 channels. Up to 8 front-ends can fit within one chassis and multiple chassis can connect through Ethernet using a Spider-HUB industrial network switch.

The high channel count system can also include the Spider-80SGi or Spider-80Ti modules when data from strain, strain gage based sensors, RTDs, thermocouples or any other special sensors need to be acquired with Spider-80Hi system.

Time Synchronization

The integration of the IEEE 1588v2 protocol for time synchronization results in accuracy better than 100 ns. This technology provides an excellent phase match even when front-ends are used at their highest sampling rates.

New Hardware Introductions and Improvements to Existing Front-Ends					
Front-end Types	Spider-80Hi	Spider-80Ci	Spider-80Xi	Spider-80SGi	Spider-80Ti
Max Sampling Rate	256 kHz	256 kHz	102.4 kHz	102.4 kHz	2 kHz
Bandwidth	115.2 kHz	115.2 kHz	46 kHz	46 kHz	-
Max Sampling rate for Raw Time Data Recording (Max Channels)	256 kHz (8 Channels /front-end)	256 kHz (8 Channels /front-end)	102.4 kHz (8 Channels /front-end)	102.4 kHz (8 Channels /front-end)	2 kHz (16 Channels/ front-end)
Number of Inputs Per Front-end	8	8	8	8	16
Connector Type	BNC	BNC	BNC	LEMO	3-pin screwed terminal
Input Type	IEPE Voltage TEDS	IEPE Voltage TEDS Charge Inputs	IEPE Voltage TEDS	Voltage Strain gage Strain gage-based sensors MEMS DC-based sensors	3-wire RTD K type thermocouple
Max Input Range	±20Vpk	±20Vpk	±20Vpk	±10V	-----
Dynamic Range	160 dB	160 dB	160 dB	120 dB	-----
Input Protection Voltage	±220V	±220V	±220V	±40V	-----
Analogue to Digital Converter Per Channel	Dual 24-bit ADC	Dual 24-bit ADC	Dual 24-bit ADC	24-bit ADC	-----
Phase Match	< 1° up to 20 kHz	< 1° up to 20 kHz	< 1° up to 20 kHz	< 1° up to 20 kHz	-----

Introducing the Ultra-Compact Spider-20H, Spider-HE & Spider-20i with 256 kHz Sampling Rate

Crystal Instruments' smallest form-factor portable DAQ device received an upgrade in the 9.0 release. The new generation of Spider-20 systems supports sampling rates of up to 256 kHz for data acquisition and recording.



The newest generation of Spider-20 systems are now available in three unique forms:

Spider-20H (Wi-Fi)

The Wi-Fi version of Spider-20 supports a 256 kHz sampling rate, includes 4 GB of built-in flash memory and a battery.

Spider-20HE

The Ethernet based version of Spider-20 supports a 256 kHz sampling rate, includes 4 GB of built-in flash memory and a battery.

Spider-20i

A new addition to the traditional Spider-20 series is the Spider-20i. The Spider-20i is an Ethernet based Spider-20 system supporting

a 256 kHz sampling rate with an industrial enclosure. Without any buttons or a battery, this device is suitable to be deployed in rough industrial environments for momentary or permanent data acquisition, recording or monitoring.

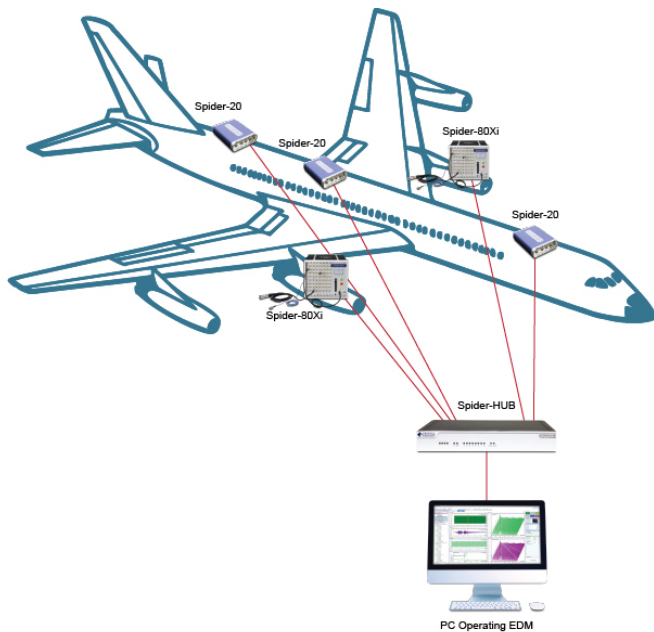
Extended Input Range

The new generation of Spider-20 products also received an upgrade to the input range. An input range of up to 20V is now available for these devices compared to the 10V input range of the previous generation.

High Channel Count Synchronized Data Acquisition

The Ethernet versions of the Spider-20 (Spider-20HE or Spider-20i) can combine into a high channel count system for synchronous data acquisition. The high precision IEEE 1588v2 protocol provides excellent phase match between the channels of different front-ends, even at the highest sampling rate of 256 kHz.

Synchronized Data Acquisition Between Spider-20E and Spider-80X/Spider-80Xi Systems



The Spider-20 series of products are ultra-portable and can be mounted at even remote locations. The Spider-80X and Spider-80Xi on the other hand are powerful front-ends that can chain together to obtain simultaneous data acquisition for up to 1024 channels.

There are times when sensor cable lengths cannot easily reach the extreme corners where data needs to be acquired. A typical example is an airplane where multiple sensors are needed near the engine, but a few sensors are also placed all along the aircraft.

With EDM 9.0, multiple Spider-20s can be combined with the Spider-80X or Spider-80Xi front-ends to create a high channel count system. A Spider-80Xi with tens or hundreds of channels can be placed to monitor the vibrations on an engine while portable Spider-20 units can be placed far from the engine at different locations within the airplane to ensure synchronized data acquisition at all locations.

Support for Strain-gage Based Sensors on Spider-80SG or Spider-80SGi

The Spider-80SG is capable of supporting all types of strain gage based sensors along with the ability to send customized excitation

voltage to the sensors.

On/Off	Measurement quantity	Input mode	Engineers unit	Sensitivity	Input range	Power supply	Read sensor's excitation
1	On	Force	Bridge based Sensor	0.00010 (mV/V/LBF)	10V	2.5V	2.5V (Auto)
2	On	Force	AC-Differential	2.10000 (mV/V/LBF)	10V	2.5V	2.5V (Auto)
3	On	Force	DC-Differential	2.20000 (mV/V/LBF)	10V	2.5V	2.5V (Auto)
4	On	Force	Bridge based Sen...	2.00000 (mV/V/LBF)	10V	2.5V	2.5V (Auto)
5	On	Force	Bridge based Sen...	2.00000 (mV/V/LBF)	10V	2.5V	2.5V (Auto)
6	On	Force	Bridge based Sen...	2.00000 (mV/V/LBF)	10V	2.5V	2.5V (Auto)
7	On	Force	Bridge based Sen...	2.00000 (mV/V/LBF)	10V	2.5V	2.5V (Auto)
8	On	Force	Bridge based Sen...	2.00000 (mV/V/LBF)	10V	2.5V	2.5V (Auto)

The sensitivity of strain gage based sensors are typically ratio-metric and depends on the excitation voltage.

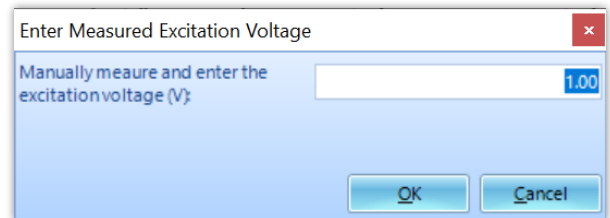
EDM 9.0 introduces the Bridge based sensor as one of the input modes. Selecting this option allows users to configure the sensitivity as a ratio-metric value.

On/Off	Measurement quantity	Input mode	Engineers unit	Sensitivity	Input range	Power supply	Read sensor's excitation
1	On	Force	Bridge based Sen...	0.00010 (mV/V/LBF)	10V	2.5V	2.5V (Auto)
2	On	Force	Bridge based Sen...	2.10000 (mV/V/LBF)	10V	2.5V	2.5V (Auto)
3	On	Force	Bridge based Sen...	2.20000 (mV/V/LBF)	10V	2.5V	Manually enter
4	On	Force	Bridge based Sen...	2.00000 (mV/V/LBF)	10V	2.5V	2.5V (Auto)

In addition to the availability of setting the sensitivity, it is also important to use the accurate value of the excitation voltage to read the measurement quantity accurately.

Due to the voltage drop across the lead wires connecting the sensor to the front-end, there could be a voltage drop which, at times, could be significant to mandate its measurement for accurately estimating the measurements.

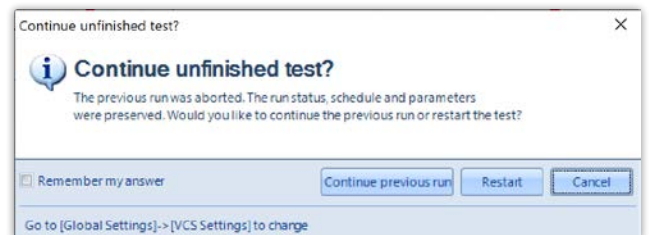
EDM 9.0 provides users with the option to automatically measure the excitation voltage as seen at the terminals by using the remote sensing feature.



Users also have the option to manually measure the excitation voltage at the terminals and to enter it. These options ensure that the excitation voltage is accurately used to measure the data with complete precision.

Save and Continue an Unfinished Test

Unfinished tests in EDM-VCS or EDM-DSA that are aborted due to a user event or by a system event are now automatically saved. The unfinished duration of these tests can now be continued exactly from the point where it was stopped.



This feature is predominantly helpful in various vibration controller tests scenarios where a test has ended prematurely or must be stopped prematurely by the user. The following scenarios illustrate helpful applications of this feature.

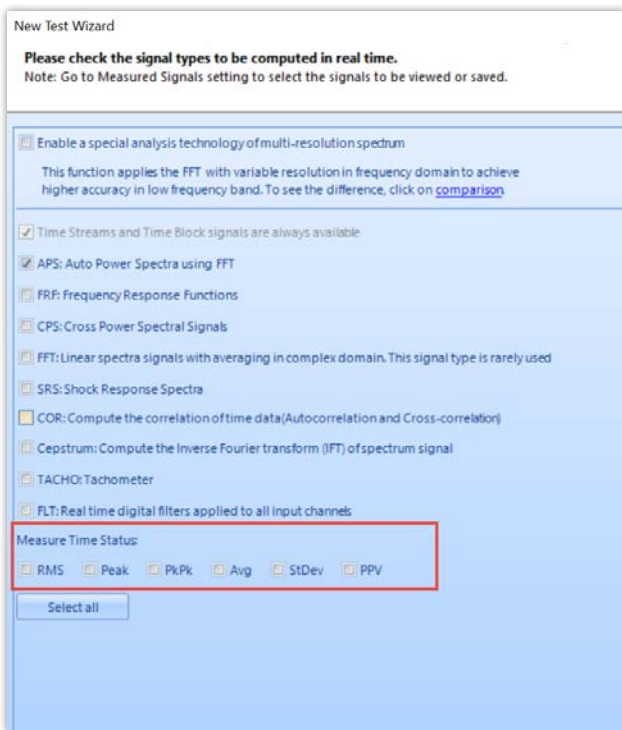
- Users can run very long vibration tests for several days by stopping the test at the end of the day and continuing it on a different day.
- Tests aborted due to sensors falling off or damaged fixtures can be continued after the necessary fixes are completed.

EDM 9.0 is programmed to cache the test whenever the test stops without completing the run schedule. The user has an option to continue the test from the point where it was stopped or to restart the test from the beginning.

The cached test is available even after EDM or the PC restarts.

Introducing Statistics Signals in EDM-DSA

Statistics signals including average and standard deviation are added to the FFT Analysis test in EDM-DSA. With improvements to the existing peak and RMS signals: Peak, RMS, Peak-Peak, Average and Standard Deviation are available in the FFT analysis test.



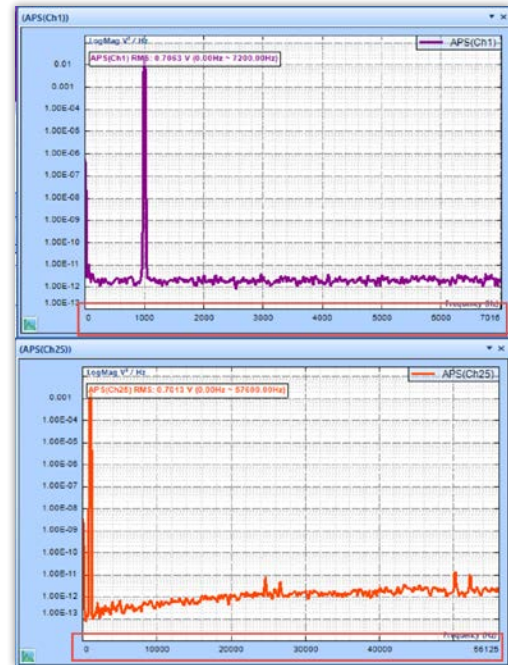
Measured Signals Setup

Signal name	Measure	Record list	Signal color	Recording Destination
001 Peak(Ch1)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	■	PC,Flash
002 Peak(Ch2)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	■	PC,Flash
003 RMS(Ch1)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	■	PC,Flash
004 RMS(Ch2)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	■	PC,Flash
005 PkPk(Ch1)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	■	PC,Flash
006 PkPk(Ch2)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	■	PC,Flash
007 Avg(Ch1)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	■	PC,Flash
008 Avg(Ch2)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	■	PC,Flash
009 StDev(Ch1)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	■	PC,Flash
010 StDev(Ch2)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	■	PC,Flash

These signals are available as time history signals, which allows these signals to be recorded to the PC in real time. Thus, these signals can be viewed for the entire duration of the test during any point of the test or after the test is complete.

Introducing Frequency Domain Signals in Variable Sampling Rate

The variable sampling rate feature can calculate the frequency domain signals for all modules even when the sampling rate of a module is different from the test sampling rate.

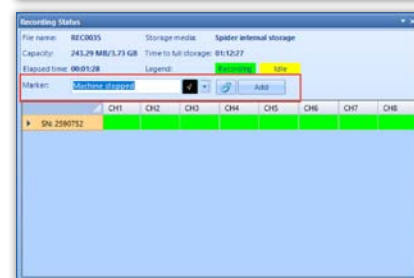


The variable sampling rate is useful with strain, temperature, and displacement sensors where frequency domain signals are not of prime importance.

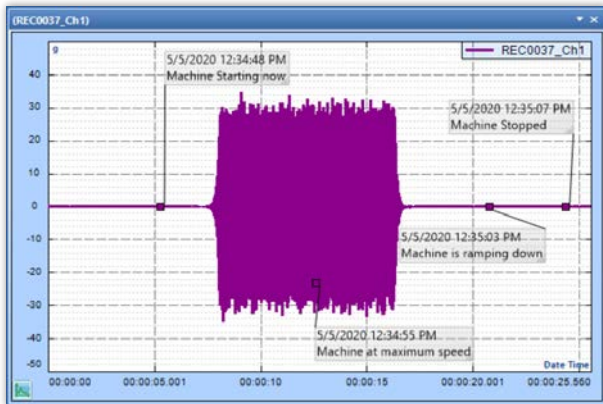
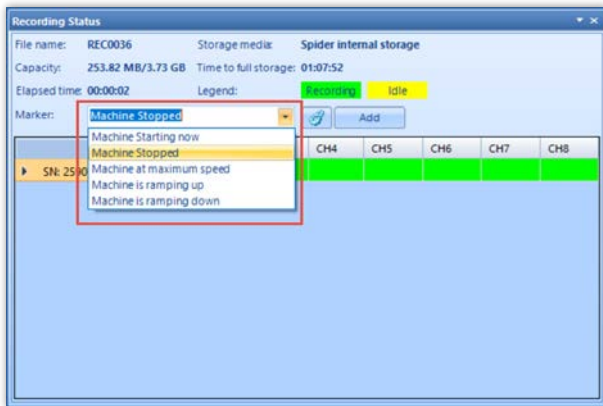
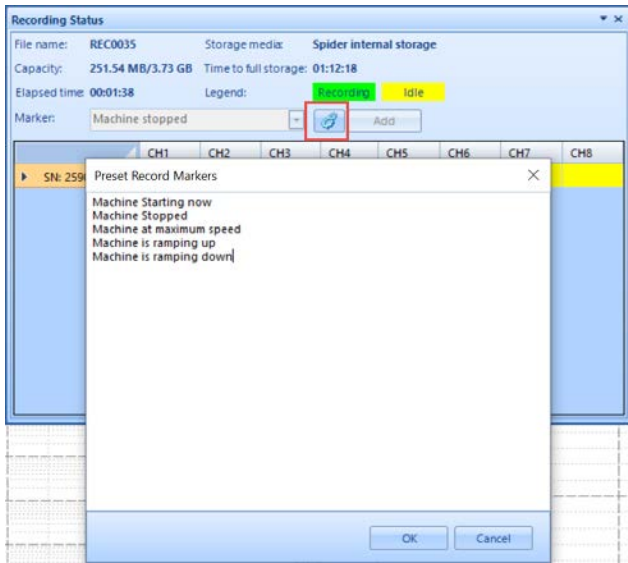
Introducing Time Markers for Raw Time Recording Data

During raw time recording, users will find it useful to mark an event for review after the data is downloaded. EDM 9.0 is introducing this feature for all EDM modules.

Add a simple marker by clicking on the “Add” button or add specific text into the available text box to insert further details.



Users have the option to pre-configure a list of events and to quickly select an event to mark the recording.



The added markers are available in the raw time data for a review at any time after the test is complete.

Support for Microsoft SQL Server 2017 and 2019

EDM 9.0 has received significant upgrades in all areas including support for the latest version of Microsoft SQL Server.



Support for SQL Server 2017 and 2019 is included to allow users to take advantage of the powerful features provided by this software.

Ease of Connecting IEPE Sensors with Spider-80SGi

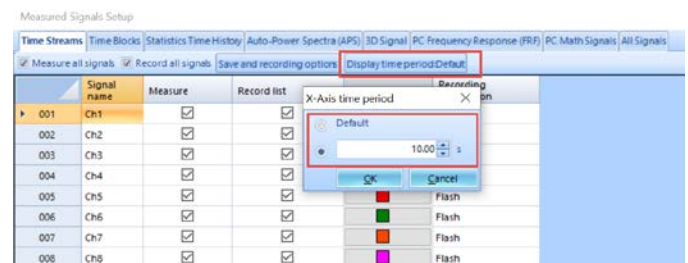
The introduction of support for IEPE sensors extends the Spider-80SGi system capabilities as a powerful general-purpose data acquisition device. The Spider-80SGi system now supports a wide range of sensors including strain gages, strain gage-based sensors, MEMS sensors, DC sensors, and potentiometers in addition to IEPE sensors.



The provided break-box is convenient for custom connecting strain gages or any of the supported sensor types.

The new breakout box released with EDM 9.0 includes BNC connectors to facilitate effortless connections to IEPE based sensors.

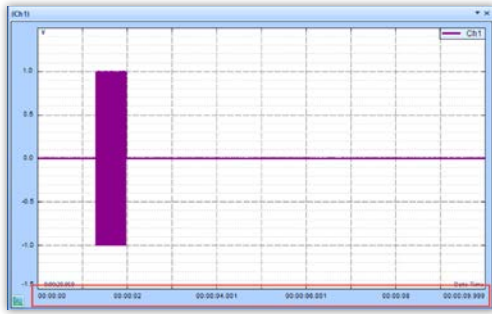
New Features in EDM Dynamic Signal Analysis Adjustable X-axis Range for Live Time Stream Display



Certain tests or analysis require a transient to be completely visible or at times requires the duration of raw time data to be visible for several seconds.

Users can view live raw time stream displays on EDM software. However, users had little flexibility available to select the time period of the X-axis when viewing raw time data. The time period was largely limited by the selected sampling rate.

EDM 9.0 introduces a new feature that allows users to view and customize the time period of the X-axis during a live stream. Users can select large time period values, even at the highest sampling rate, to view live time data without having to record and post process.



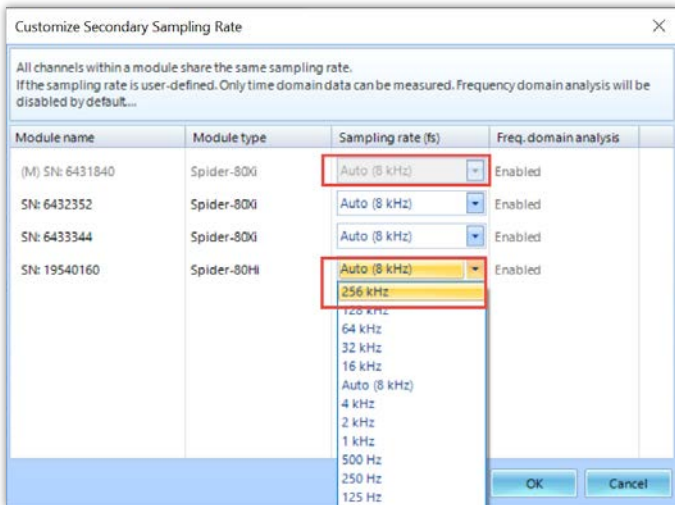
Users can select time period values of up to 60 seconds (1 minute), which displays live data along with 60 seconds of history in a live stream.

This sufficiently covers all scenarios of drop shock and pyro shock tests requiring the time display to show the transient along with time data until the test object reaches a steady state.

Variable Sampling Rate Allows Selection of Higher Sampling Rates

The Variable Sampling Rate feature is introduced to facilitate the sampling of low sampling rate signals such as temperature or strain.

Certain drop shock tests require additional time recording at the highest possible sampling rate to capture all the events, while performing spectral calculations at a lower sampling rate. The introduction of the Spider-80Hi and Spider-80Ci systems provides users with sampling rates of up to 256 kHz for time data recording while other modules perform frequency analysis at required sampling rates.



These requirements are now be easily met by designating the Spider-80Hi or Spider-80Ci as a slave and setting it to the highest possible sampling rate of 256 kHz while setting the usual test parameters for all other modules.

Offset Nulling is Available in Event Action Rules

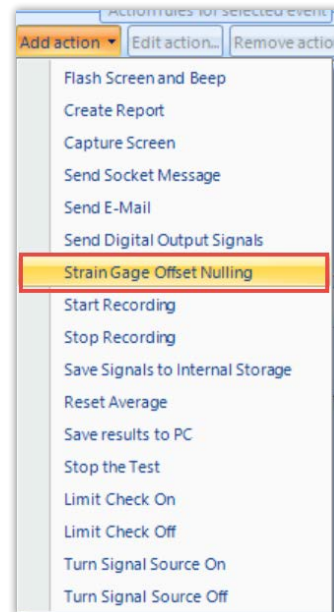
Strain gages and strain gage-based sensors need to be offset corrected before starting any measurement. Users can accomplish this using the Offset Nulling feature of EDM software.

Running strain gages or strain gage based sensors may result in a drift due to heat from powering up. To obtain accurate readings, it is essential that the sensors are run until the temperature variation on

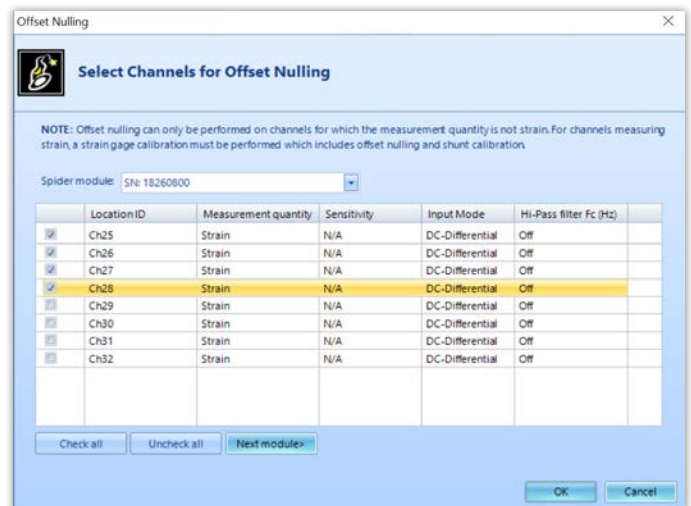
the sensors is stabilized.

At this point, an offset correction is required before recording any data or before performing any measurements.

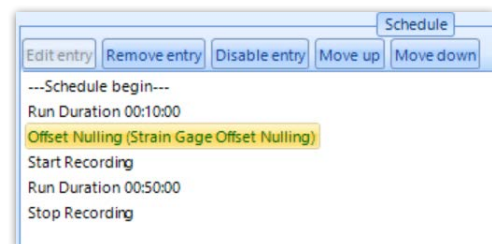
To accommodate these applications, Offset Nulling is introduced as an action in the event action rules.



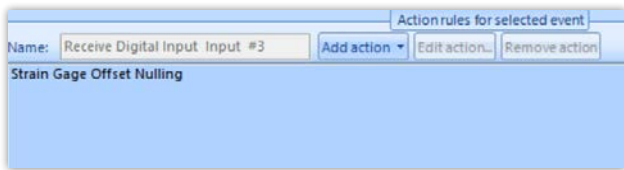
Users can set the channels requiring offset correction. Some sensors reading static pressure, torque, or displacement data should not be nulled. This feature allows the user to select sensors that need to be offset corrected.



Using the very powerful event action rules, the actions can be set as a user event and can be included in the run schedule.



It can also be used to execute at the onset of an event.

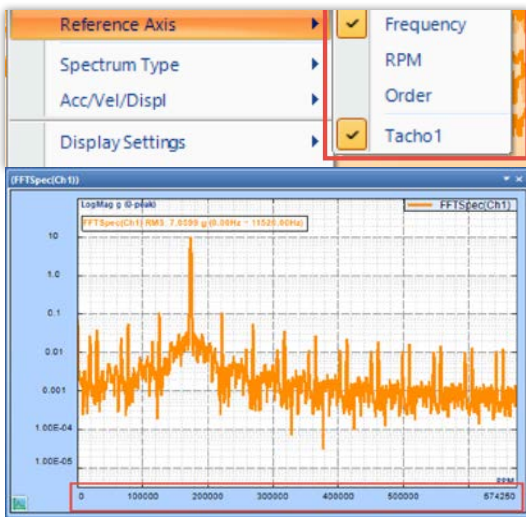


Customizable Reference in X-axis in Spectral Signals

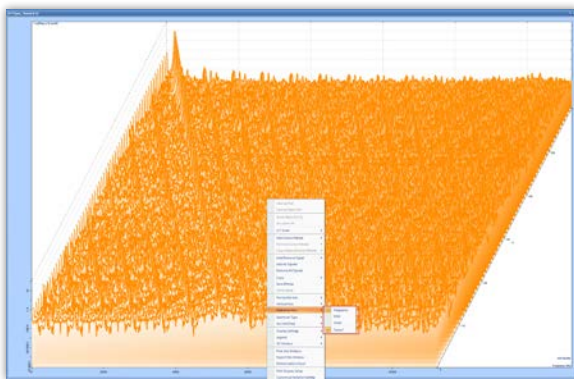
Analyzing rotating machines involves detecting the spectral peaks and their references to the speed of rotation.

Flexibility in selecting the reference for the Y-axis allows for easier analysis and ease of correlating the spectral peaks with RPM.

EDM 9.0 introduces the ability to modify the reference of the X-axis for spectral signals.



A choice of tachometers is also available to enable the selection of either tachometer as the reference.



This option is also available for 3D signals.

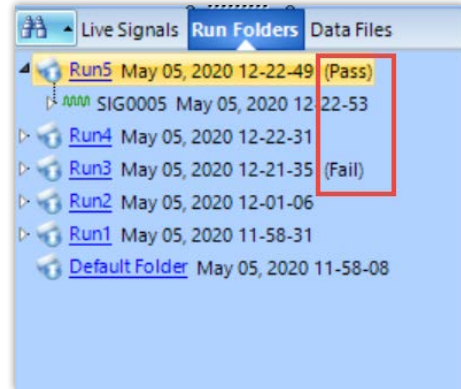
Attach Limiting Results to Run Folders

Limit tests are increasingly used for production testing and DUT testing to determine if the DUT passes or fails the set criteria.

Limit name	Limit not exceeded	Limit exceeded	Attach result to
APISCH1_Limit	Pass		Run3
APISCH2_Limit	Pass		Run3
APISCH3_Limit		Fail	Run3
APISCH4_Limit	Pass		Run3

In a typical test, each run is attributed to a specific device. EDM 9.0 includes the run information to be displayed along with the limit status.

The limit status can further be tagged to the run to determine the status of the run.



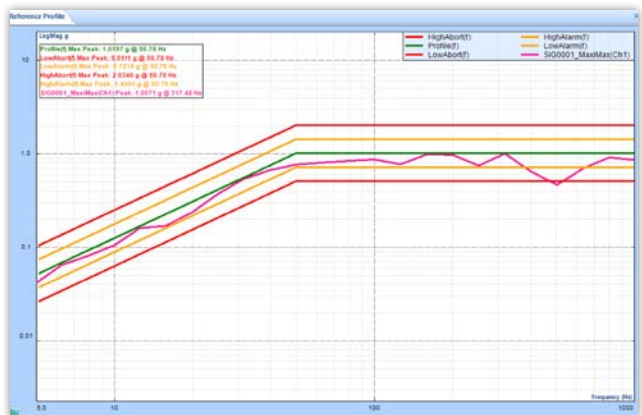
Depending on the test type, the status of a particular channel or a user defined criterion can be attached to the run. Sometimes, failure to the critical part of the DUT is more valuable criteria to disqualify a product. In such scenarios, results of a specific limit can be attached to the run.

This result of the run is displayed alongside the run in the run folders.

DSA-SRS Reference Profile Includes Alarm and Abort

The EDM-DSA FFT analysis test reference profile for SRS includes both alarm and abort lines.

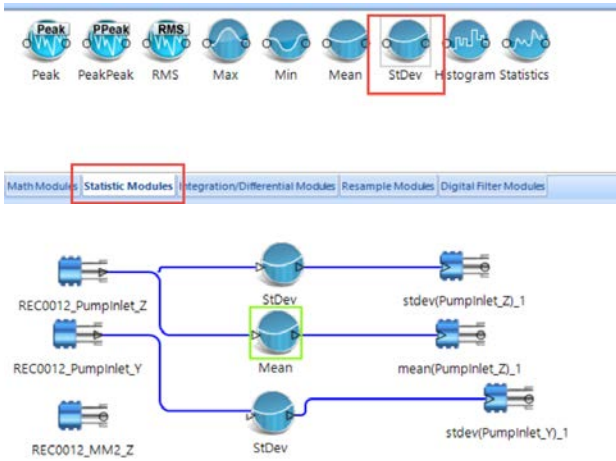
Insert row	Delete row	Append row	Clear table	Filter	Import/Analyze	Export	Y axis	LogMag				
	Frequency Hz	Acceleration g	Slope dB/Oct	High Abort dB	High Alarm dB	Low Alarm dB	Low Abort dB					
1	5	0.0509058	7.81298	6	3	-3	-6					
2	50	1.01972	0	6	3	-3	-6					
3	200	1.01972	0	6	3	-3	-6					
4	1000	1.01972	0	6	3	-3	-6					



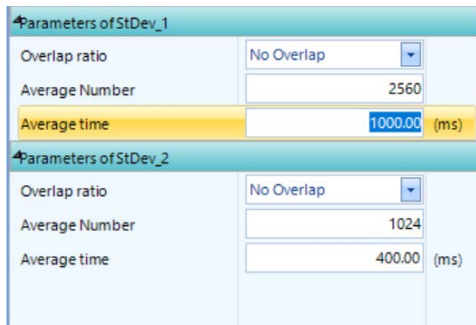
New Features in Post Analyzer

Standard Deviation Added to Statistics Signals in PA

The statistical module in PA now supports the calculation of standard deviation.



Users can add standard deviation to any number of channels. In addition, a channel can be customized to calculate the standard deviation in addition to mean or any other property or module.

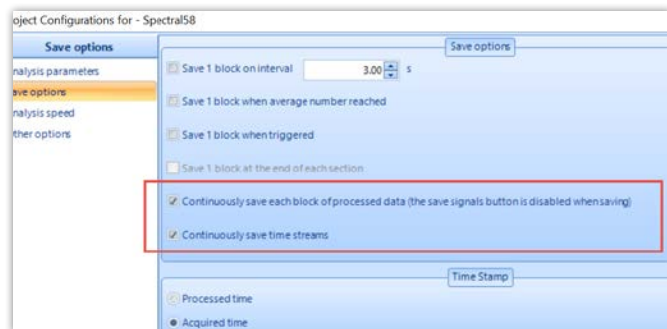


Like other statistical calculations, the duration of time for which standard deviation needs to be computed can be set by the user in terms of points or time along with the option to set the overlap.

Recording and Saving Simultaneously

Users can post process raw time data for a wide range of applications. The powerful tools available in the Post Analyzer software allows users to apply data conditioning to raw time data. Users can also process time data to derive a variety of frequency signals. Both operations can be performed simultaneously.

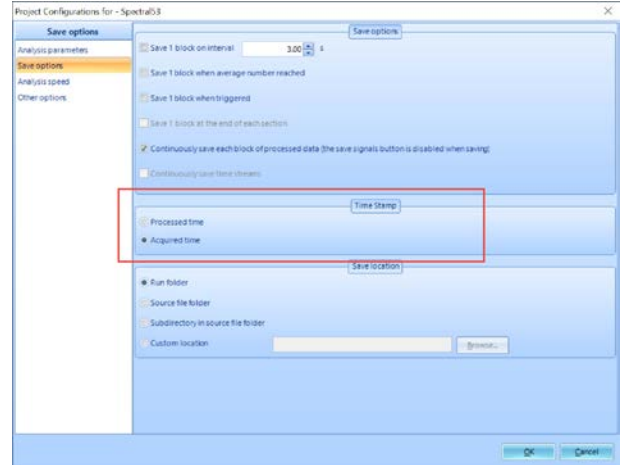
Users can record the data conditioned time data while saving the frequency signals.



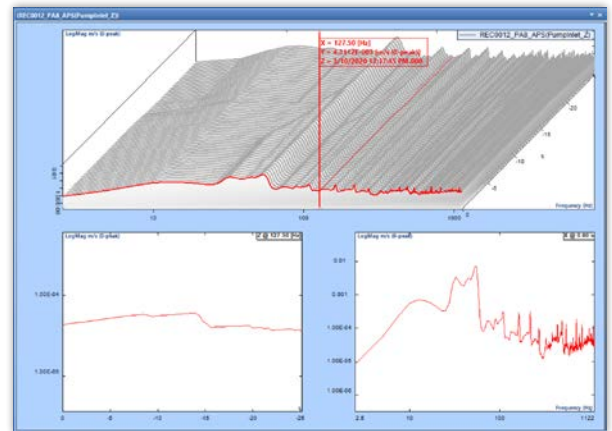
PA 9.0 also allows the user to save all blocks of processed time and frequency data along with the continuous time recording of conditioned raw time data.

Option to Choose Acquired Time or Processed Time for Saved Signals

Users can select the time stamp of saved signals or processing signals to be the original time of acquisition or the time at which the data is being processed.



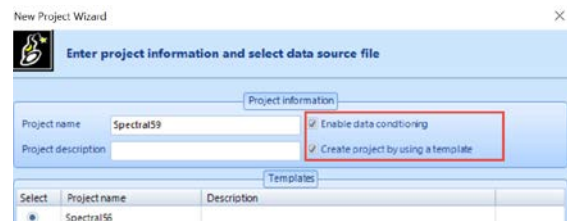
In scenarios where multiple raw time files need to be processed or when batch processing is employed on data collected over a wide period of time, it is necessary to distinguish the processed data. A convenient way to associate the processed data with raw data is to associate the time stamp of the raw data to processed data.



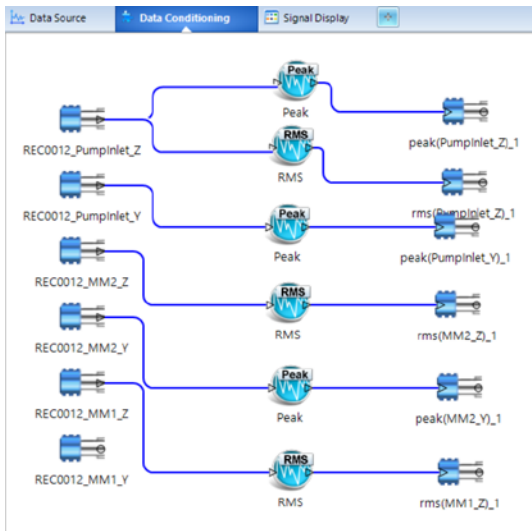
When multiple types of processing are performed on the same data, the Processed Time option can be selected to distinguish the different iterations of processing.

Data Conditioning Module Added to Project Template

Selecting a project as a template now saves the data conditioning in addition to the test parameters, save settings and measured signal settings.



Enabling the data conditioning along with a template imports all the data conditioning used in the template to the new project.

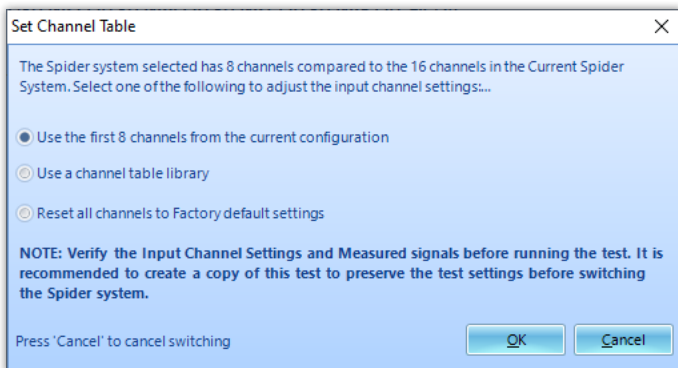
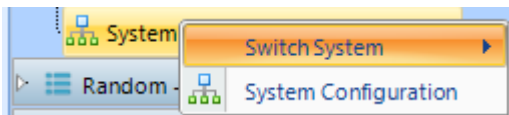


New General Features

Ease of Adding Modules to Tests or Switching Tests Between Spider Systems of Different Channel Counts

EDM 9.0 introduces a convenient way to modify the Spider system associated with the test to any other Spider system of a different channel count.

This extends the capabilities of the test templates to be used for any channel count system. In addition, a test using the Spider-NAS can be switched to a system without a Spider-NAS.



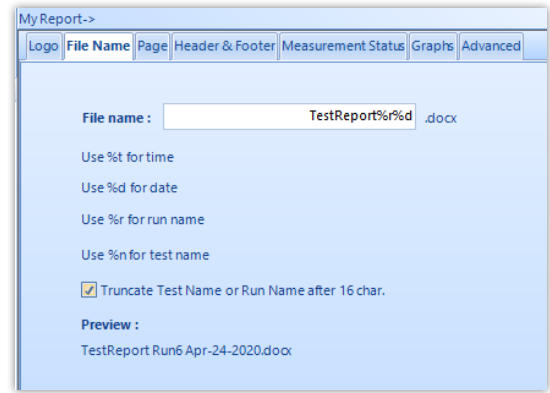
Smart algorithms handle the addition or removal of channels without deleting the existing channel configuration.

Channel specific configurations including limit channel setup are preserved for the channels that are carried over after the change to the number of input channels.

Introducing Customizable File Names for Report

File names for reports is an important aspect when there is a high quantity of reports generated from several tests.

EDM 9.0 introduces several customization characteristics to generate the file name of reports.

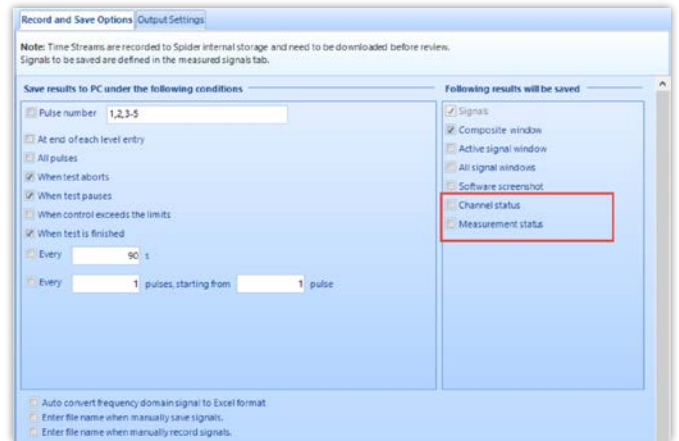


Users can generate a report using customized names combined with macros for test name, run name, date, time or a combination of any test characteristics.

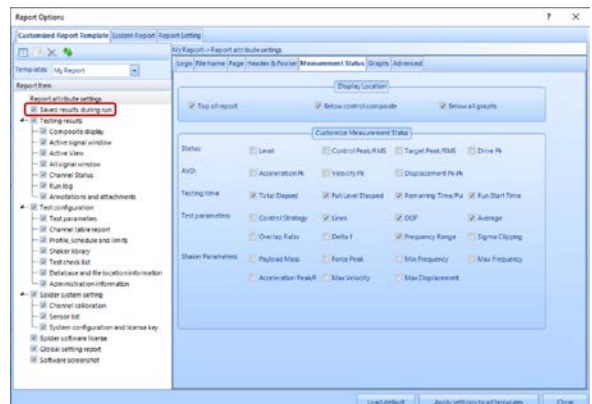
Channel Status and Measurement Status Added to Saved Signals and Report

Channel status includes peak, RMS, and average values in addition to any error codes generated for a channel. The measurement status includes information about elapsed time, remaining time, control or target RMS, and peak values (VCS) to name a few.

These values are dynamic and continuously change over the course of a test. When signals are saved, it is also essential to identify the measurement status and channel status at that instant to make the signal data more meaningful and complete.



EDM 9.0 introduces saving channel status and measurement status along with the time and frequency signals. A customizable combination, called results, can be selected by the user every time needs saving.



The information is also made available when a report is generated to ensure that all the relevant information is saved to the report.

Introducing Advanced RTD Non-Linearity Correction for Accurate Temperature Measurements

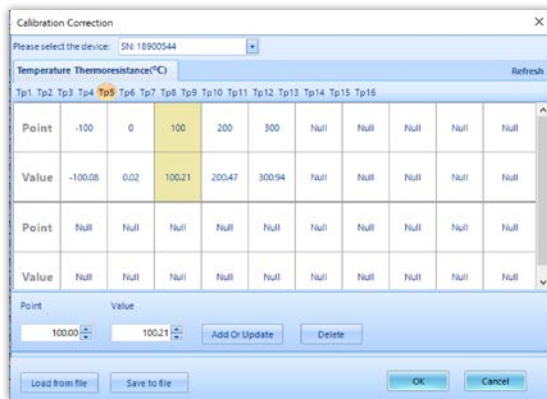
RTD sensors are typically non-linear in the range of measurements that they operate. To ensure an accurate measurement of temperature from the RTDs, it is important to correct for the non-linearity.

RTD PT100	Custom	Auto
RTD PT100	IEC 751/IEC607	Auto
RTD PT100	IEC 751/IEC60751 Custom	Auto
RTD PT100	IEC 751/IEC60751	Auto

The advanced non-linearity corrections are now available from the input channel table which can either be based on a standard or custom defined.



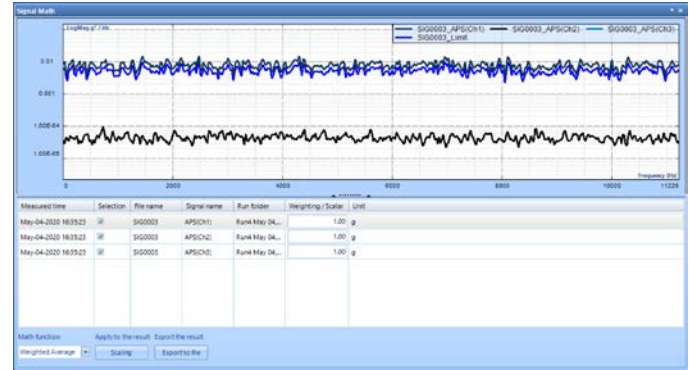
A choice of A, B and C values or α , β and δ values can be defined by the user.



RTD sensors that have deviated from the standard can be corrected using a table if the correction values are known.

Real Time Signal Averaging Tool

A real time signal averaging tool is introduced in the EDM 9.0 release for EDM-DSA.



Users can use the display math tool by dragging and dropping any number of time or frequency signals.

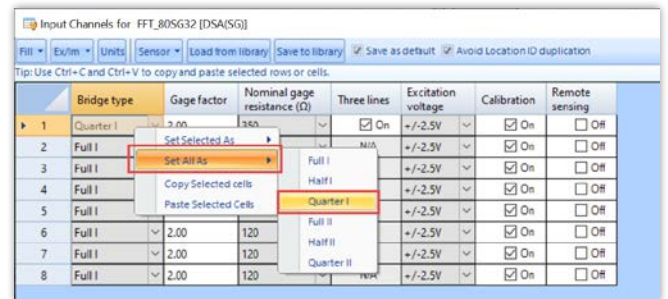
Options for standard or weighted average are available. The results generated through the average can be conveniently exported to one of the wide range of formats supported by EDM software.

A widely used application for this feature is to use the resulting spectra as a limit profile.

Simultaneously Configure All Strain Gage Input Channel Parameters

Users can simultaneously assign measurement quantity and sensitivity for multiple channels in the input channel table.

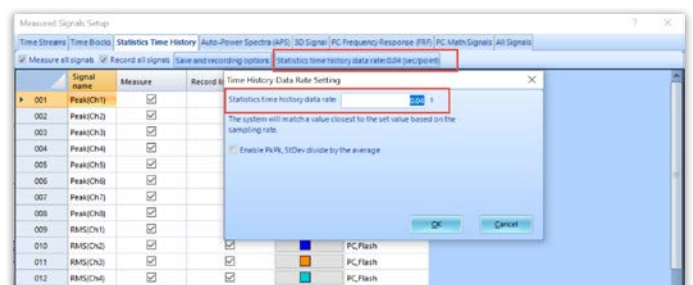
This feature is now extended to the strain gage input channels' parameters.



It is now possible to simultaneously set the bridge type, gage factor or any of the strain gage related parameters. This feature will greatly simplify the strain gage configuration for high channel count systems.

Customizable Rate for Statistics Time History Signals

Time history signals can be customized to be measured for a user defined time period.



This new option is available where the time history signals are defined. Custom values in seconds or within hundredth of a fraction can be entered.

Addition of Measurement Point, Coordinates and DOF to Input Channel Table

The input channel table in DSA and VCS now includes measurement point, coordinate and DOF information.

Ch/DOF	Channel type	Location ID	Measurement quantity	Engineer unit	Sensitivity	Input mode	Non-Linear parameter	Sensor	Max. sensor range	High-Pass Filter (Hz)	DOF	Measurement Point	Coordinate
1	Ch/DOF	Control	Ch/DOF	Acceleration	1.0000 m/s ²	AC Single End	N/A		10.000 (G)	0Hz	XZ	1	XZ
2	ED/Ch	Monitor	Ch/DOF	Acceleration	0.1000 m/s ²	BE	N/A		0.0000 (G)	0Hz	XZ	2	XZ

This information not only acts as a reference for users but also helps during Vibration Visualization for VCS or DSA tests.

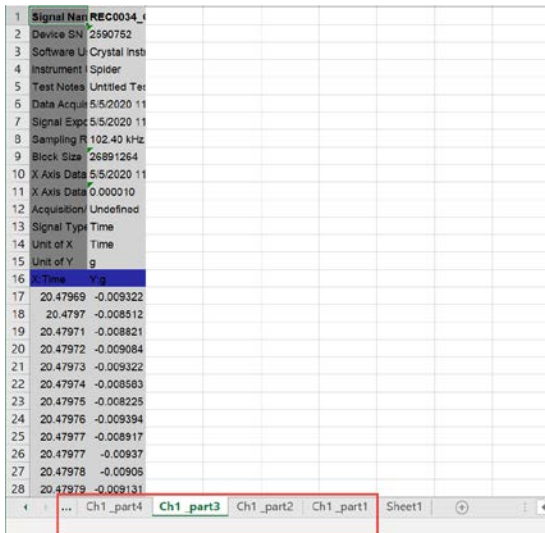
This data can also be used with EDM-Modal for Modal Analysis.

Export to Multiple Excel Files

Microsoft Excel is a useful tool for analyzing or saving data. All EDM modules support exporting time and frequency signal data to Excel files. However, Excel has a limitation to the number of rows and columns that are defined.

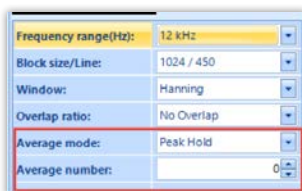
When exporting raw time recording data at high sampling rates, the number of data points are usually so large that it will exceed the row limitation of Excel.

To prevent data loss, EDM 9.0 introduces the option to split and export data to multiple Excel tabs.



MAJOR IMPROVEMENTS
EDM Dynamic Signal Analysis
Indefinite Peak Hold Spectrum

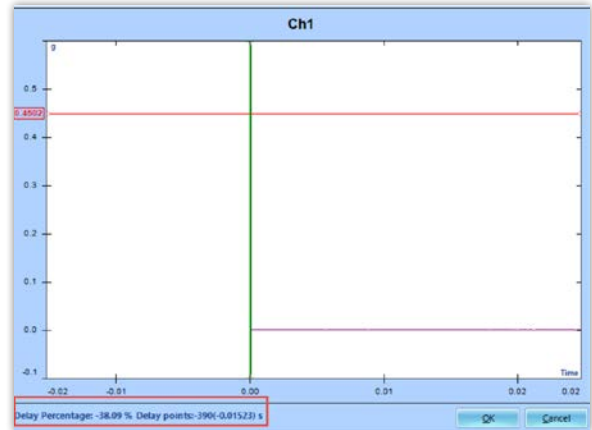
EDM 9.0 introduces the average number of 0 for peak hold averaging. This allows the peak hold computation to be performed for an indefinite duration and analyzes the peak spectral values at each frequency for the entire duration of a test.



This convenient feature will help users to identify the maximum peak values for any frequency for the entire duration of test.

Improvements to Pre-Trigger Parameters Display

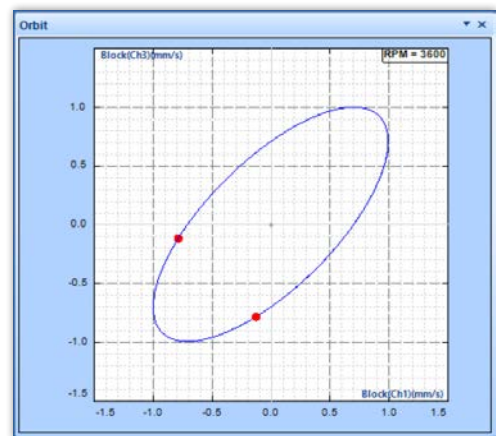
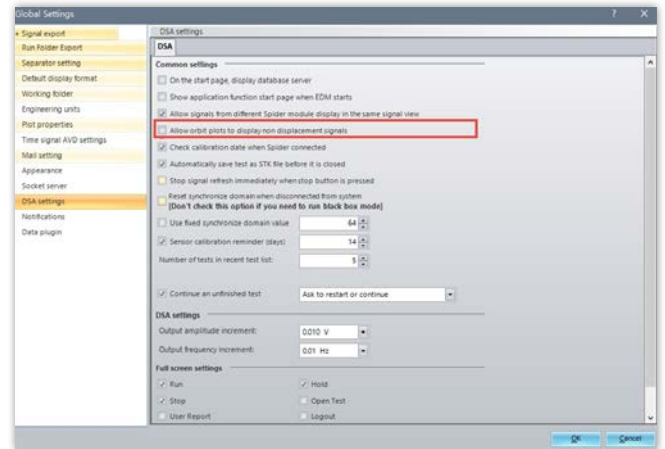
A convenient display is introduced to allow users to view the Delay Percentage, Points or Delay Time in the trigger window.



The cursors can now be used to accurately adjust the pre-trigger.

Orbit Plot Supports Display of Non-displacement Signals

The most common application of orbit plots is to plot the displacement. However, the concept of an orbit plot is very useful in some aerospace applications where position to velocity or position to acceleration plots are needed.

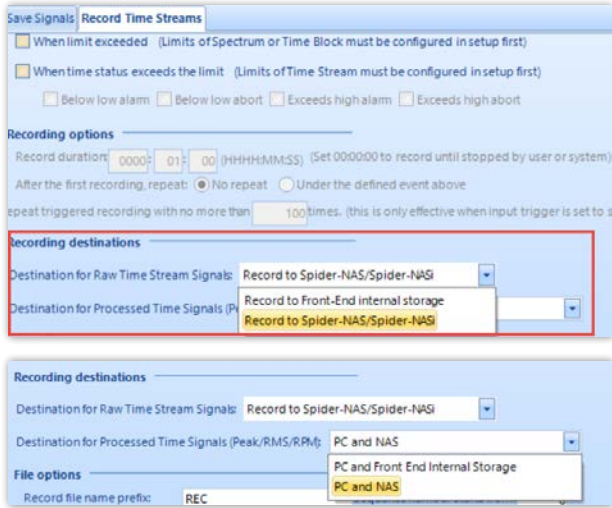


The current orbit plot feature can be comfortably extended for plotting and studying these types of X-Y plots.

General Improvements

Conveniently Configure and Review Recording Destination

The recording destination is an important parameter when a Spider-NAS is included with a Spider system. EDM 9.0 introduces a convenient option to select the recording destination for the time stream data and statistics time data.



When a PC is available and connected, the statistics time signals always save to the PC for the entire duration of the test which enables users to view the historic data while the test is running. In addition, it is also possible to save the data to the front-end internal storage or Spider-NAS which helps to save data in the absence of a PC or if the network connection is not reliable.

The user selected destination or the default destination is now conveniently viewed through the Measured Signals Setup page.

Measured Signals Setup					
Time Streams Rosette Signals Time Blocks Auto-Power Spectra (APS) 3D Signal PC Frequency Response (FRF) PC M					
<input checked="" type="checkbox"/> Measure all signals <input checked="" type="checkbox"/> Record all signals Save and recording options					
	Signal name	Measure	Record list	Signal color	Recording Destination
001	Ch1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	■	NAS
002	Ch2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	■	NAS
003	Ch3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	■	NAS
004	Ch4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	■	NAS
005	Ch5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	■	NAS
006	Ch6	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	■	NAS

Measured Signals Setup					
Time Streams Rosette Signals Time Blocks Statistics Time History Auto-Power Spectra (APS) 3D Signal PC Math Signal					
<input checked="" type="checkbox"/> Measure all signals <input checked="" type="checkbox"/> Record all signals Save and recording options Statistics time history data rate: 0.04 (sec/point)					
	Signal name	Measure	Record list	Signal color	Recording Destination
001	Peak(Ch1)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	■	PC,Flash
002	Peak(Ch2)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	■	PC,Flash
003	Peak(Ch3)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	■	PC,Flash
004	Peak(Ch4)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	■	PC,Flash
005	RMS(Ch1)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	■	PC,Flash
006	RMS(Ch2)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	■	PC,Flash
007	RMS(Ch3)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	■	PC,Flash
008	RMS(Ch4)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	■	PC,Flash

Out of Band Overload Detection on Front-end LEDs

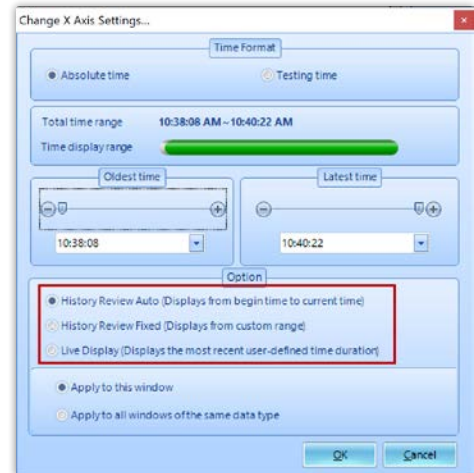
Drop shock tests, pyro shock tests or data acquisition during blast testing may at times have sufficient energy to drive the sensors at their resonance frequency. Piezo resistive sensors are the most suitable for these purposes as they have a higher resonant frequency. However, most IEPE sensors used in these tests have a resonant frequency of less than 100 kHz which may easily saturate the sensor out of its usual band.

Once saturated, the data acquired is corrupted and not usable.

EDM 9.0 added the detection of out of band saturation before any low pass filters to ensure that the data is not corrupted. Hardware indicator LEDs have been programmed to display the out of band saturation.

Enhanced History Review for Time History Signals

Statistics signals in VCS and DSA can be viewed for the entire duration of the test using the PC Recording and History Display feature. In EDM 9.0, the History Review Mode received major improvements.



The time duration for a specific period of a historic signal or live display is now conveniently configured by the user using several featured options.

Introducing Overall RMS Display for All Signals in the Plot

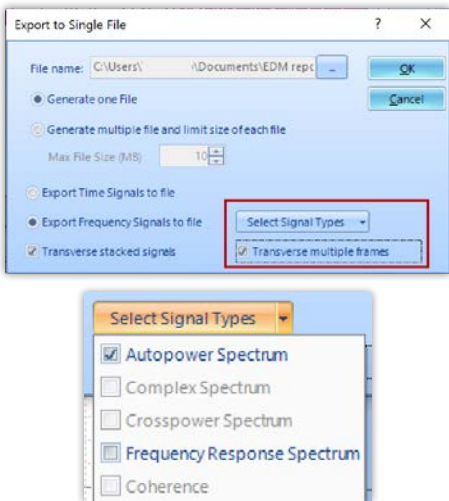
In EDM 9.0, overall RMS for all the signals in a given plot can be computed and displayed.



The total energy in signals acquired through sensors specialized for different frequency ranges can be acquired and the overall energy can be estimated.

Improvements to “Export to Single File”

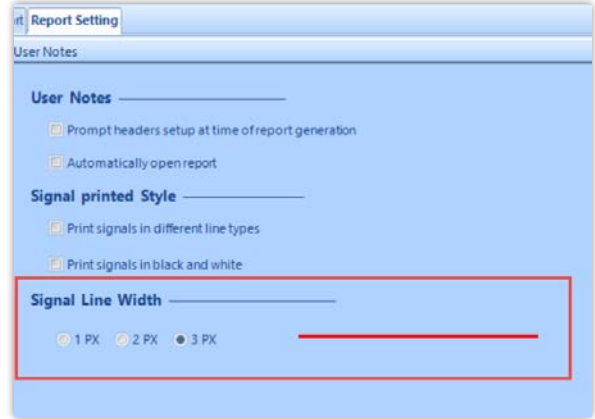
The Export to Single File feature provides an option to export multiple signals from multiple channels as a single file.



This feature is significantly improved. In addition to more options to select the signal types, the option to export in MAT and UNV file formats is added.

Customizable Line Width for Signals in Report

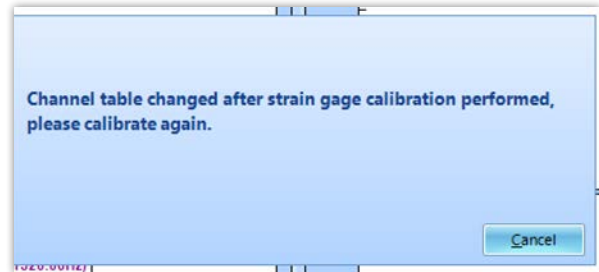
The line width can be independently adjusted for signals displayed on a report.



This allows for the optimum selection of the line width in a report without having to modify the displayed line width in EDM.

Enhanced Calibration Notification for Strain Gage Calibration

Strain gage channels need to be calibrated to determine the offset and a shunt calibration needs to be performed to accurately estimate the gain. Calculating these values is essential to calculate the strain values accurately. Since these values depend on the sensor used, a calibration needs to be performed each time a sensor (strain gage) is modified.



EDM 9.0 introduces a friendly notification to ensure that users do not forget to calibrate the strain gages to maintain the accuracy of measurements.

Enhanced Calibration Review Window for Strain Gage Calibration

Once a strain gage calibration is performed which includes offset and gain calculations, the user must review these values to ensure that they are within the expected range.

Strain Gage Calibration

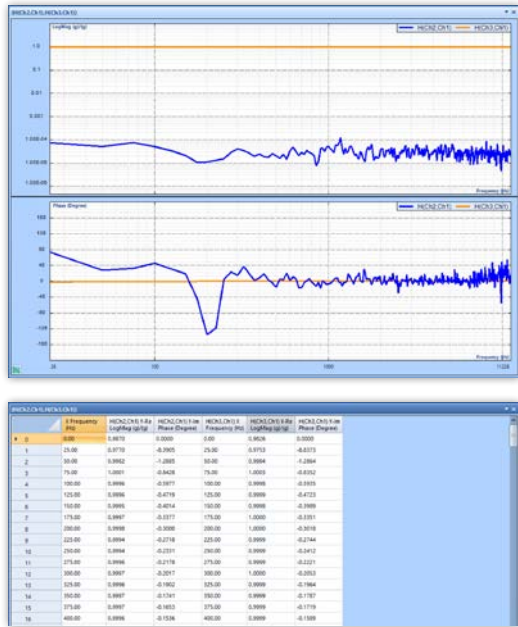
Measure and Calibrate

Location ID	Offset nulling		Shunt calibration				Measured ex. volt.
	Measured strain	Error (%)	Simulated strain	Measured strain	Gain adjust value	Error (%)	
CH1	-2.879 µε	-0.00576 %	1625 µε	1637 µε	0.9928	-0.0237 %	N.A.
CH2	7.923 µε	0.0158 %	0 µε	N.A.	1	N.A.	N.A.
CH3	1.007e+04 µε	20.1 %	0 µε	N.A.	1	N.A.	N.A.
CH4	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
CH5	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
CH6	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
CH7	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
CH8	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

EDM 9.0 introduces a user-friendly window to detect any obvious errors which can denote an incorrect connection or a bad sensor.

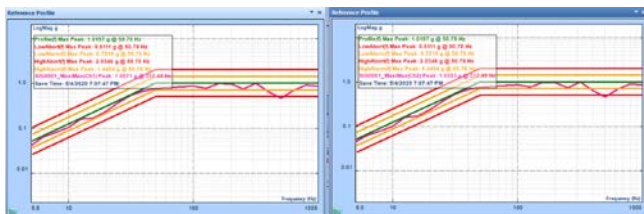
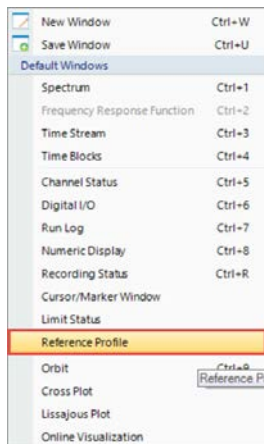
Improved Text Display for Signals with Phase (FFT/FRF/CPS)

Users can conveniently display signals consisting of phase information on EDM software. Converting to text format when multiple signals are plotted within the same chart was a limitation in previous versions. Improvements to EDM 9.0 enables users to plot multiple signals on a chart and allows users to display signals in text format.



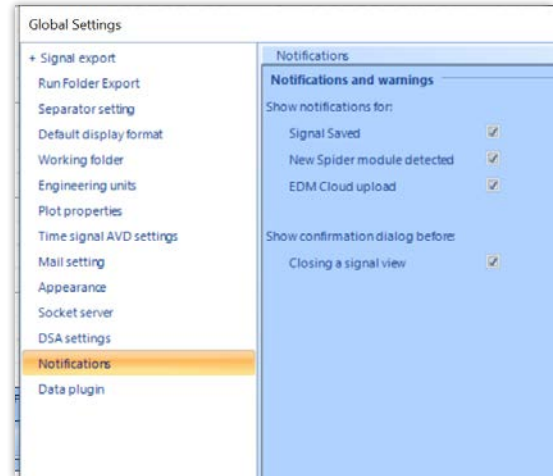
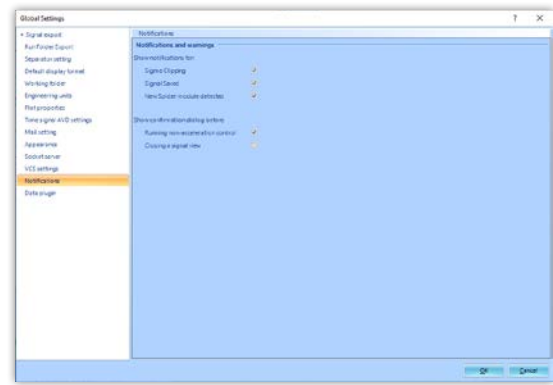
Enable Multiple Charts of SRS Reference Profiles

Multiple windows for SRS Reference can be created in EDM 9.0. This allows users to plot different signals in different charts.



Ability to Disable Certain Notifications in EDM

Certain notifications are expected to be seen during certain tests. For example, sigma clipping can be frequent when it is set to 3 during a random test since several frames may experience sigma clipping.

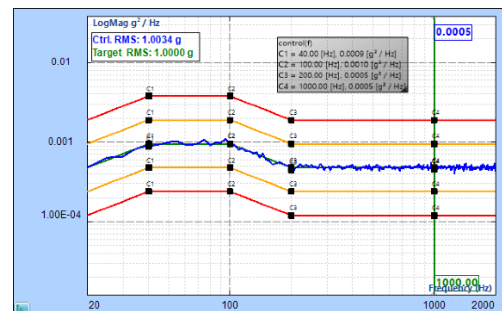
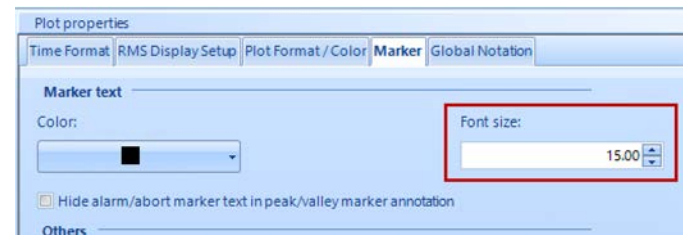


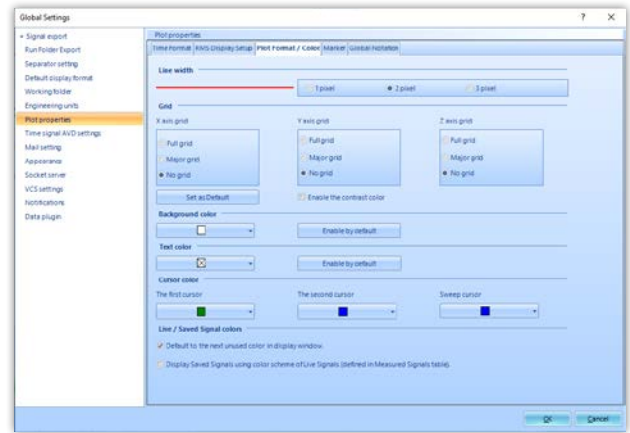
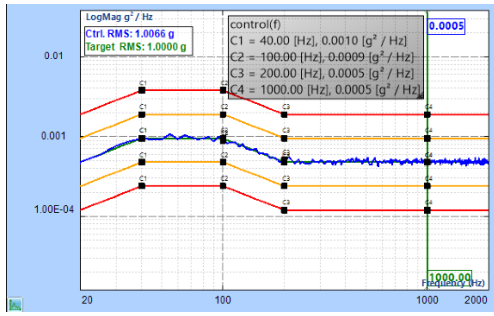
In certain tests, signals are frequently saved. In these cases, frequent notifications to the user are distracting.

EDM 9.0 allows users to disable a selection of notifications in EDM-VCS and EDM-DSA.

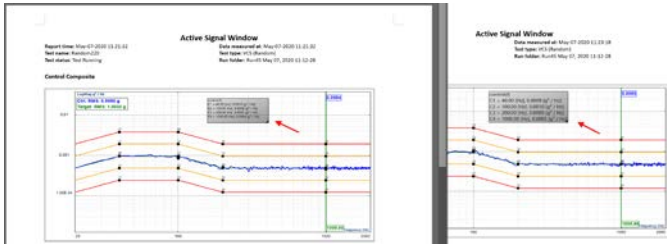
Customizable Font Size of Marker Text in EDM Display and Report

EDM 9.0 allows customizable font sizes for markers (peak markers, harmonic markers, etc.) on the display as well as on the report.





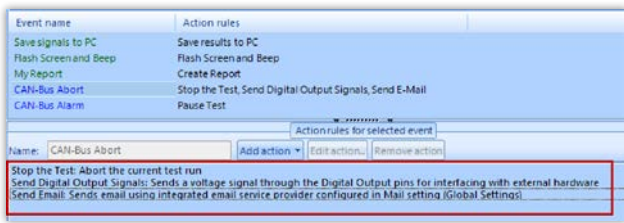
To accommodate all cases, users can select the signal coloring scheme for saved and live signals.



This allows the user to have an optimized size and maintain visibility without hiding data.

Expanded Details in Event Action Rules

Event action rules are a powerful component of EDM which provides users with a pseudo programming ability to configure actions towards specific system events or user defined events.



EDM 9.0 includes more details for each event to provide users with a more user-friendly, approachable, and intuitive tool.

Support to TEAC – TAFFmat Data Format

EDM 9.0 supports exporting files to the TAFFmat data format which is utilized by TEAC data recorders.

Improved PC Resources Check

EDM 9.0 introduces an advanced PC check to ensure that the available RAM and processor speed meets the minimum requirements to efficiently run EDM software.

Share Global Settings with Systems on LAN

EDM installed on multiple computers on the same LAN can share the same global settings stored in a central place. Requires editing the global config file.

Improved Signal Color Setting for Saved Signals and Live Signals

Different applications or different users require different display requirements. In certain applications, reviewing the same signal over the course of time is essential while in other applications comparing the signals from two different channels is more essential and requires the same coloring scheme used for live signals.

SOFTWARE RELEASE HISTORY

Dates of software releases:

Type	Release	Exact Version	Release Date
Release	EDM 4.2	CI 4.2.0.3	2/28/2014
Patch	EDM 4.2.0	CI 4.2.0.14	7/2/2014
Release	EDM 5.0	CI 5.0.0.2	11/27/2014
Patch	EDM 5.0.1	CI 5.0.1.3	2/27/2015
Release	EDM 5.1	CI 5.1.0.6	8/12/2015
Release	EDM 6.0	CI 6.0.0.1	5/19/2016
Patch	EDM 6.0.2	CI 6.0.2.9	8/9/2016
Release	EDM 6.1	CI 6.1.0.4	2/7/2017
Patch	EDM 6.1	CI 6.1.0.27	8/22/2017
Release	EDM 7.0	CI 7.0.0.6	2/1/2018
Patch	EDM 7.1	CI 7.1.0.7	7/19/2018
Release	EDM 8.0	CI 8.0.0.1	2/2/2019
Release	EDM 8.1	CI 8.1.0.1	11/13/2019
Release	EDM 9.0	CI 9.0.0.4	6/5/2020

SYSTEM REQUIREMENTS

Minimum System Requirements:

- **Operating System Support:** Windows 7 SP1 or higher
- **Operating System Type:** 32-bit or 64-bit
- **Processor Speed:** 1.5 GHz Dual-Core x86
- **RAM:** 4 GB
- **Available Storage Space:** 10 GB

Recommended System Requirements (Minimum for Spider Systems Higher than 16 Channels):

- **Ethernet Speed:** at least 1 Gbps Ethernet port on the computer
- **Network Cables:** provided by Crystal Instruments
- **Operating System:** Windows 10, 64-bit
- **Processor:** Intel Core i7, 2.0 GHz or Higher
- **RAM:** 8 GB DDR3 1600 or higher
- **Available Storage Space:** 10 GB or higher
- **Spider-HUB Firmware Version:** 2.0.5.17 or higher

VERSION COMPATIBILITY

Product and Software Version	Firmware Versions
Spider-80X/80Xi/80Hi/80Ci	
EDM Testing 9.0.0.x	9.0.0.x
Spider-81 (v7.x)	
EDM Testing 9.0.0.x	9.0.0.x
Spider-81B (v7.x)	
EDM Testing 9.0.0.x	9.0.0.x
Spider-80SG/SGi	
EDM Testing 9.0.0.x	9.0.0.x
Spider-20/20E/20HE/20H/20i	
EDM Testing 9.0.0.x	9.0.0.x

Product and Software Version	Firmware Versions
CoCo-80	
EDM 6.0.2.x	4.0.x
CoCo-70X	
EDM Testing 9.0.0.x (EDM CoCo for DSA)	1.8.x
Vibration Diagnostic System 1.4.2.x	1.8.x
CoCo-80X/90X	
EDM Testing 9.0.0.x (EDM CoCo for DSA)	1.8.x