



EDM 9.1

Engineering Data Management Software Release Notes

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



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RELEASE HIGHLIGHTS

Introducing Spider-80Ti for Temperature Measurements (Supports RTDs and Thermocouples)

The new EDM 9.1 release and Spider-80Ti hardware supports RTD (PT 100) and thermocouple (k-type) measurements. An individual Spider-80Ti card supports 16 channels of measurements.

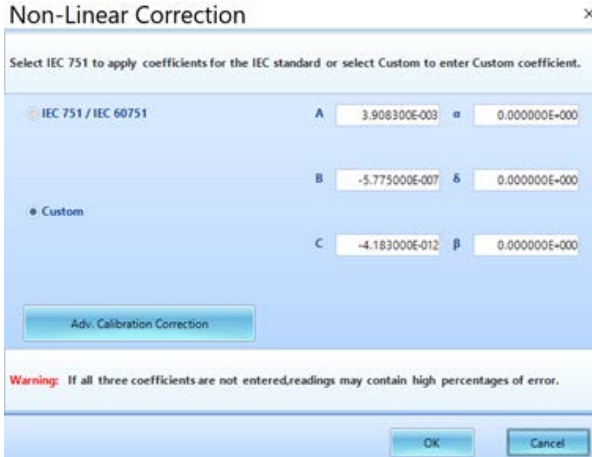


RTD Non-linear Correction Standard

EDM 9.1 has built-in non-linear correction for RTD PT 100 measurements which follows the IEC 60751 Standard. This ensures highly accurate measurements from RTD sensors.

Location ID	Measurement quantity	Engineering unit	Sensitivity	Input mode	Non-Linear correction
Tp1	Temperature	°C	N/A	RTD PT100	IEC 751/IEC607
Tp2	Temperature	°C	N/A	RTD PT100	IEC 751/IEC60751 Custom
Tp3	Temperature	°C	N/A	RTD PT100	IEC 751/IEC60751

EDM 9.1 allows users to set custom RTD coefficients for a custom non-linear correction. The A, B and C values can be entered under the custom option.



EDM 9.1 also provides advanced linearized offset correction over a range of temperatures under the Adv. Calibration Correction option. This creates a linearized offset correction between the two breakpoint values, further ensuring the accuracy of the calculations.

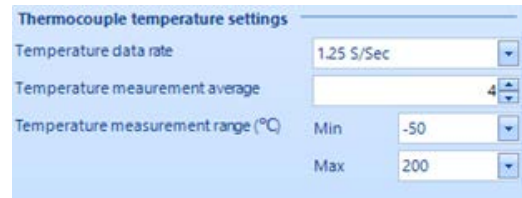
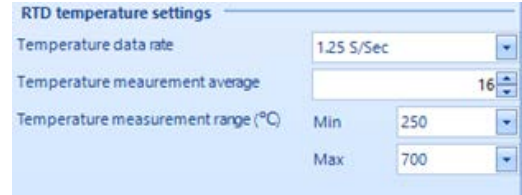
K-type Thermocouple Measurements and Cold Junction Compensation

EDM 9.1 and the Spider-80Ti features a built-in cold junction compensation routine that measures the ambient temperature with a high precision temperature sensor. The system uses this information to compensate for not having the cold junction physically at 0°C. The compensation allows the Spider-80Ti to use the NIST

coefficients for the K- Type thermocouple measurements and helps EDM 9.1 accurately interpret changes in voltage measurements to the corresponding temperature measurements.

Temperature Measurements – User Selectable Sampling, Averages, Range-based Gain Adjustment and Numeric Display

EDM 9.1 introduces flexibility and options for users to tailor measurements according to an application. Users can set test parameters for temperature measurements independent of any other module present in the Spider system.



The system automatically sets the gain value to improve the accuracy of the measurements based on the temperature range set and expected inputs from sensors. All temperature measurements are recorded as time histories, which allows users to review past data during a current test run while actively collecting new live data. Live data can also be displayed in numeric form.



Introducing a 16 Channel Strain Measuring Spider-80Gi Module

The new Spider-80Gi module is a low-cost strain measuring front-end that supports 16 channels in a single module (2 chassis slots) and uses compact break-out boxes and D-sub connections. The Spider-80Gi can interface with DC excitation sensors, MEMS sensors, strain gauges and other ratiometric and bridge-based sensors.



The Spider-80Gi combines with other Spider-80Xi front-ends to simultaneously acquire data from various sensors, including the Spider-80Xi, Spider-80SGi and Spider-80Ti.

The Spider-80Gi provides a cost-effective solution when measuring large number of simultaneous strain channels.

Introducing EDM Cloud – Cloud-based Test Monitoring and Storage

EDM Cloud is a premium web-hosted service provided for users to monitor the status of all vibration tests across multiple Spider controllers. EDM Cloud allows access to multiple users according to their customized account privileges to view the data and status of Spider systems. Lab administrators can simultaneously monitor multiple tests from anywhere in the world using EDM Cloud.

Storage expansion allows users to store all the required data and to share the test status and results with several individuals or groups. Support has been enabled for both EDM vibration tests and EDC temperature/humidity testing.

ID	PL NAME	SENSOR NAME	TEST NAME	TEST TYPE	TEST DESCRIPTION	SYSTEM INFORMATION	TEST STATUS	TIME ELAPSED	RUN COUNT	ACTIONS
01	DESKTOP-80X110	single	Random	VCS/Random	RTS_2000000 (8 channels)	STOPPED (Completed 14 days ago)	0:00:00	1	View Test	
02	DESKTOP-80X110	single	Shine - Random	VCS/Single Stage	Damage Spectrometry (120 channels)	STOPPED (Completed 21 days ago)	0:00:00	0	View Test	
03	DESKTOP-80X110	single	Random - FDS test	VCS/Random	Damage Spectrometry (120 channels)	STOPPED (Completed 21 days ago)	0:00:00	0	View Test	
04		Temperature	Constant value			STOPPED (Completed 8 days ago)	0:07:00	0	View Test	
05		Displacement	Sineburst			STOPPED (Completed 7 days ago)	0:00:07	0	View Test	
06		SUBSYS_26_1	Sineburst			STOPPED (Completed 7 days ago)	0:00:26	0	View Test	
07		FAT2	Sineburst			STOPPED (Completed 7 days ago)	0:00:26	0	View Test	
08		FAT2_2nd	Sineburst			STOPPED (Completed 7 days ago)	0:00:26	0	View Test	
09		Water	Sineburst			STOPPED (Completed 8 days ago)	0:00:26	0	View Test	

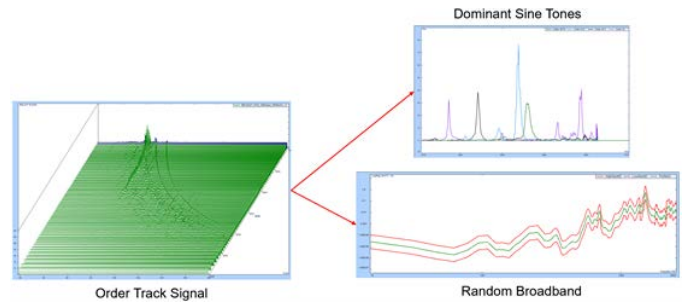
EDM Cloud allows users to create their own email address accounts and to invite other coworkers to form a team with groups underneath. Tests can be shared amongst members of the same group after configuring the upload parameters in the EDM VCS desktop application. EDM Cloud allows users to save and share several aspects of the test, including Status, Run Log, and Test Reports.

EDM Cloud can also be deployed on local servers within an organization's network. This allows an organization to limit the scope of information exchange and data sharing to users within their network to ensure data security. This feature is useful for monitoring the progress and status of environmental tests with classified information.

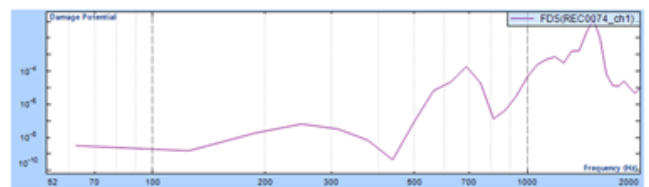
Crystal Instruments will continue investing in EDM Cloud services and will soon provide users with additional data visualization and mobile application features.

Automatically Convert Time Domain Recordings to Random or Sine on Random Profiles with Post Analyzer (PA)

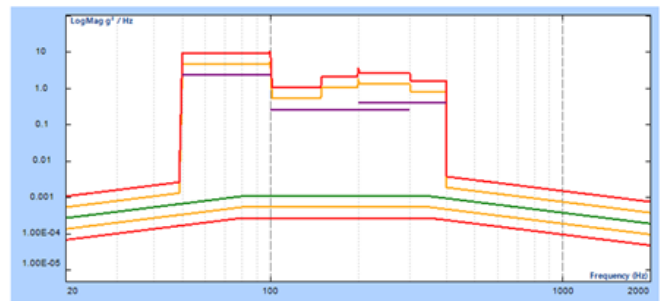
The new PA 9.1 version allows users to capture tach pulses and vibrations from rotating machinery and performs order analysis on the gathered data. Users can choose to further analyze the data to extract dominant sine tones and broadband spectrum.



Users are now able to combine the two spectral signals to create a sine-on-random signal or can use these profiles independently to excite the necessary profiles separately. In addition, users can choose to either use the profile as is or can perform accelerated life testing with FDS (fatigue damage spectrum). Users are allowed to input information about the total expected life of the DUT and the shortened testing time.



Fatigue Damage Potential



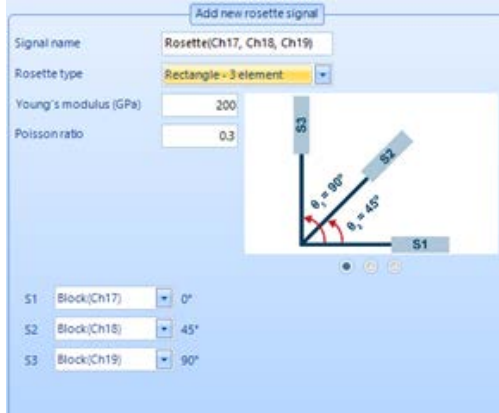
Accelerated SOR Profile

Based on user inputs and the analyzed signal, PA creates an accelerated SOR test profile with the equivalent damage of a total lifetime using the built-in FDS functions. This accelerated profile and its subsequent parameters imports into a VCS test with one click and is ready to run on a shaker.

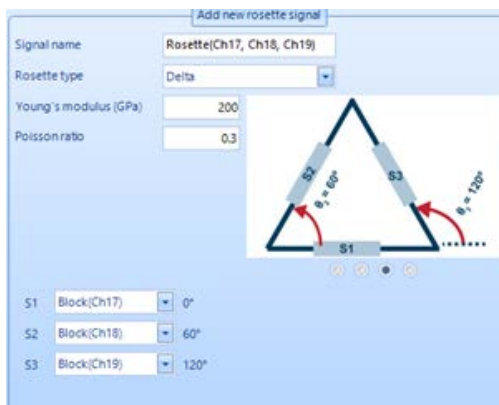
Introducing Rosette Configuration Measurement of Strain Gages

Rosette measurements are vital in strain data acquisition, and the release of EDM 9.1 provides capabilities to measure rectangular, delta or custom rosette configurations. This addition to EDM DSA allows users to measure the complete strain state of a DUT's surface.

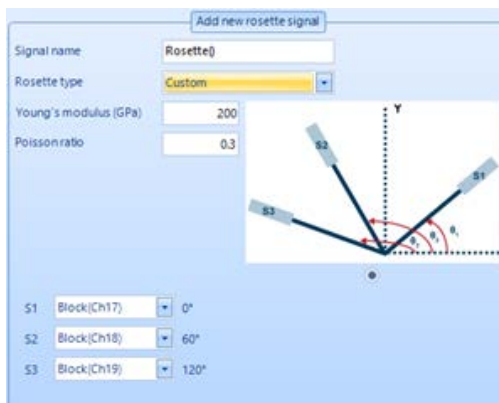
Rectangular Rosettes



Delta Rosettes



Custom Rosettes



Various measurements including Principle Stress and Strain, Principal angle, Shear Stress and Strain are calculated from the measurements.

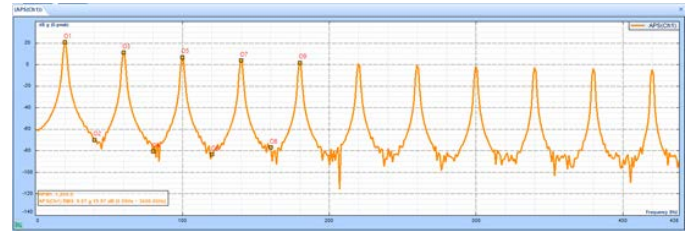
With these options the user can chose the option most convenient to their application and measure the strain on the DUT. The system also calculates the other stress and strain states associated with the

measurements.

Introducing Tacho Tracking Test Type in EDM-DSA

A new test type "Tacho Tracking" is being introduced in the Dynamic Signal Analysis (DSA) of EDM 9.1 release.

This is an easy to use diagnostic and troubleshooting tool test type for rotating machinery. The tachometer signal is used to identify the user selected orders on the APS spectrum and keeps track of the order values as the RPM changes.



Signal Name	Select Tacho	AVG	Display Format	Frequency amplitude	Freq Low (Hz)	Freq High (Hz)	S1	S2	S3	S4	Unit
APSD10	Pat Tacho RPM	Acceleration	RMS	11.839	0.00	0.00	11.839	7.2688	7.2688	2.3775	g
APSD9	Pat Tacho RPM	Acceleration	RMS	11.261	0.00	0.00	11.576	7.2687	7.2687	2.2777	g
APSD8	Pat Tacho RPM	Acceleration	RMS	0.0024948	0.00	0.00	4.1767E-05	3.034E-05	3.034E-05	2.719E-05	g
APSD7	Pat Tacho RPM	Acceleration	RMS	0.0027618	0.00	0.00	0.0001328	8.348E-05	8.348E-05	3.524E-05	g
APSD6	Pat Tacho RPM	Acceleration	RMS	0.0020105	0.00	0.00	8.8197E-05	7.0202E-05	7.0202E-05	5.647E-05	g
APSD5	Pat Tacho RPM	Acceleration	RMS	0.0027362	0.00	0.00	0.0001594	1.0467E-05	1.0467E-05	4.057E-05	g
APSD4	Pat Tacho RPM	Acceleration	RMS	0.0026874	0.00	0.00	0.0001094	7.2674E-05	7.2674E-05	3.4748E-05	g
APSD3	Pat Tacho RPM	Acceleration	RMS	0.0027362	0.00	0.00	0.00011463	9.954E-05	9.954E-05	4.3488E-05	g

A simplistic visualizing tool allows viewing the selected orders for each channel in a user specific measurement quantity. The test type allows use of both Tachometers and allows selection of any of the Tachometer to calculate and represent the data.

Spider-80SG Supports IEPE Sensors

EDM 9.1 introduces IEPE measurements on the new Spider-80SG (version 2) front-end. This new feature allows the Spider-80SG (version 2) to virtually support all types of sensors including IEPE Sensors, DC Excitation sensors, MEMS sensors, strain gauges and other ratiometric and bridge-based sensors.



The new Spider-80SG (version 2) has BNC terminals to interface directly with BNC cables or through the breakout box for open wire terminals.

Introducing In-line Charge Amplifier Support for Spider-80SG & Spider-80SGi

EDM 9.1 enables the Spider-80SG and Spider-80SGi to use in-line charge amplifiers to support charge sensors. Users can enable this input mode by navigating to **Setup->Input Channels->Input Mode** from the drop-down menu to select **In-Line Charge Converter**.

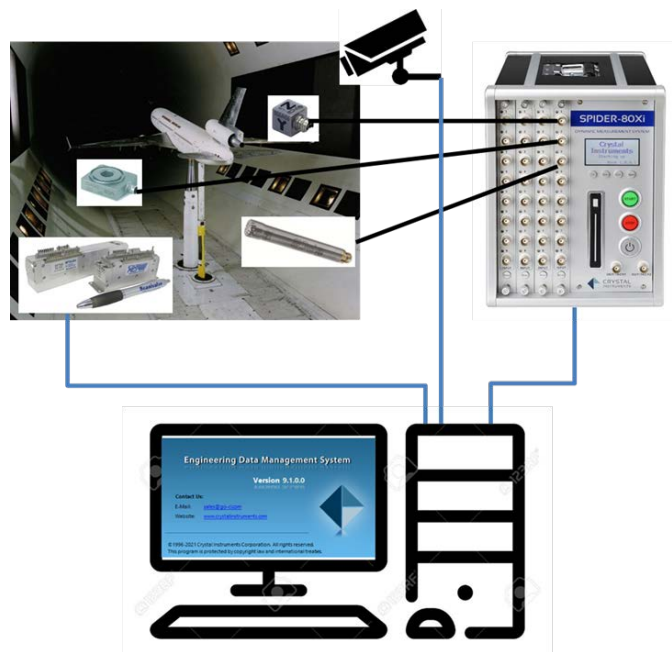
	On/Off	Location ID	Measurement quantity	Engineer's unit	In-Line charge converter sensitivity	Sensitivity	Power supply	Input mode
16	<input checked="" type="checkbox"/> On	Ch16	Acceleration		2 mV/pC	4903.32500 (pC/g)		In-Line Charge Converter
17	<input checked="" type="checkbox"/> On	Ch17	Acceleration		2 mV/pC	4903.32500 (pC/g)	2.5V	In-Line Charge Converter
18	<input checked="" type="checkbox"/> On	Ch18	Acceleration		2 mV/pC	4903.32500 (pC/g)	2.5V	IEPE AC-Differential DC-Differential
19	<input checked="" type="checkbox"/> On	Ch19	Acceleration		2 mV/pC	4903.32500 (pC/g)	2.5V	In-Line Charge Converter
20	<input checked="" type="checkbox"/> On	Ch20	Acceleration		2 mV/pC	4903.32500 (pC/g)	2.5V	Bridge based Sensor
21	<input checked="" type="checkbox"/> On	Ch21	Acceleration		2 mV/pC	4903.32500 (pC/g)	2.5V	In-Line Charge Converter

Introducing Integration of Scanvalve Pressure Sensors with EDM (Wind Tunnel Applications)

Scanvalve sensors are the most widely used sensors for pressure and temperature measurements in wind tunnel applications.

A wind tunnel set up typically requires a wide range of sensors including accelerometers, strain gages, microphones, pressure transducers, temperature sensors, etc.

The Spider range of products are optimally designed to accurately acquire data from accelerometers, microphones, strain gages and a wide range of strain gage based or IEPE sensors. The additional support for Scanivalve sensors combined with the powerful Spider systems provides a complete package for wind tunnel applications.



from any number of Scanivalve sensors. Each Scanivalve sensors supports 64 pressure channels and 8 temperature channels.

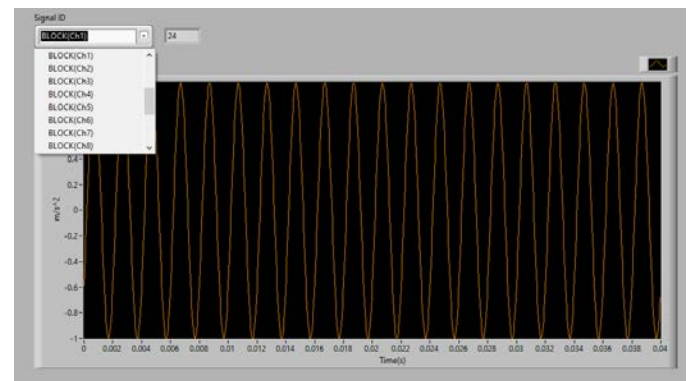
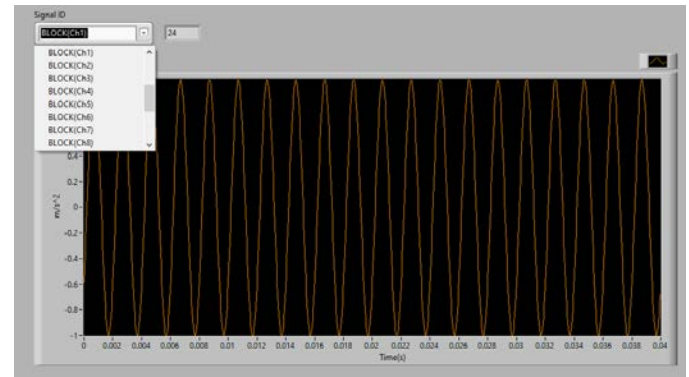
EDM-DSA 9.1 allows users to add all sensors connected on a network, configures the acquisition parameters of sensors, collects and displays live data from sensors, and also supports recording data from sensors.

Introducing Spider LABVIEW Utility

The Spider platform of products is equipped with a DSP core processor that handles data acquisition and processing.

Users can configure the analysis parameters of a Spider using LabVIEW. Raw data along with processed data can be visualized or saved through LabVIEW.

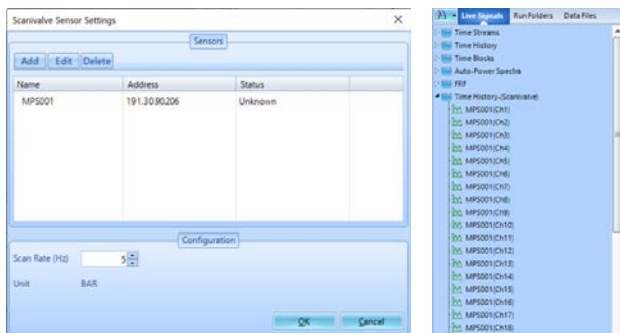
The EDM 9.1 release now supports the FFT Analysis test through LabVIEW. Functions such as creating a new test, setting up the input channel table, retrieving live data, initiating recording commands, and downloading recorded raw time data are available.



Real-time time and frequency data can be used through LabVIEW for saving or any post processing applications. Spider LabVIEW Utility includes several examples and virtual instruments (vi) to configure the Spider with a user's desired settings and to receive/visualize data.

LabVIEW helps users control a wide range of industrial equipment through the status of sensors read by Crystal Instruments' Spider systems.

The Spider product line includes front-ends such as the Spider-80SG that acquire data from a wide range of sensors including strain gages or systems like the Spider-80Ti that connect to RTD and thermocouples for temperature measurements. The addition of LabVIEW to the Spider product line supports a wide range of sensors to be read, processed and successfully deployed in large industrial



This feature supports reading pressure and temperature data

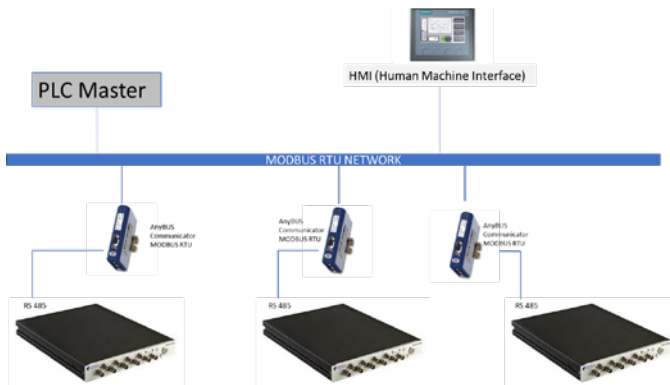
and production systems.

Introducing Send Data Over PLC Networks

Spectral Analysis in real-time and using its data for industrial automation has been increasing in recent times. Spectral Analysis on several critical machines can identify failing machines or failing components within the machines to ensure timely repairs and results in maintaining high productivity and safety.

The Spider platform of products is a popular choice for a wide range of applications requiring real-time spectral analysis. The Spider-80X and Spider-80SG support a wide range of sensors including strain gages, accelerometers, DC sensors, MEMS sensors, and microphones that connect to the system to perform real time processing.

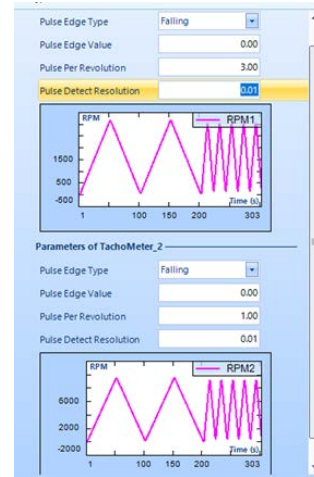
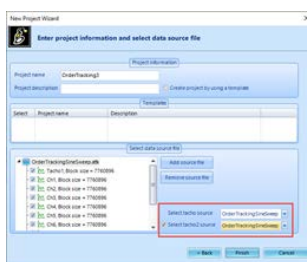
With the help of a built-in DSP core within the Spider, once configured, the Spider can run and perform the desired spectral analysis without the need of a PC. The relevant results in both time and frequency domain are readily available that could be used by machine diagnostics or the PLC to take necessary actions, when needed.



The Spider devices that are equipped with a RS 485 port, including the Spider-81, Spider-80X, Spider-80SG, Spider-80T, can be successfully deployed within the Industrial Automation networks through an Anybus communicator. The Anybus communicator acts as a bridge between the Spider and PLC to convert data into a desired format. The Anybus communicator is available for a range of protocols including PROFIBUS, MODBUS RTU, MODBUS TCP, Ethernet/IP, which enables the use of a Spider over any of the supported types of networks.

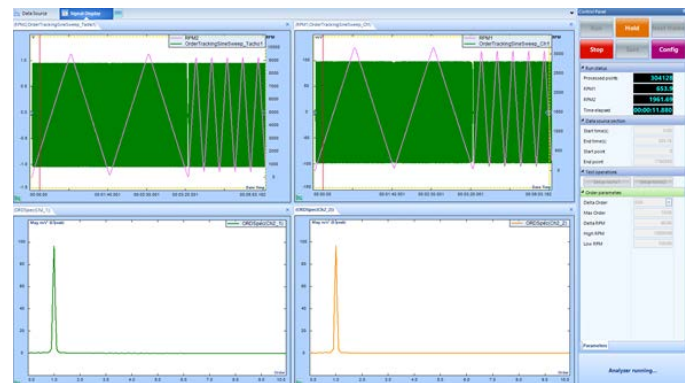
The introduction of this function allows users to customize data sent over a PLC including status, statistics or alerts based on time or frequency data. This feature equips the Spider system as an ideal choice for applications requiring continuous monitoring of industrial equipment.

Post Analyzer Supports Simultaneous Order Analysis with Two Tachometers



Order tracking applications sometimes require two tachometers to simultaneously obtain RPM data from two dependent or independent shafts. Order re-sampling is typically accomplished using one of the tachometers. Using both tachometers to simultaneously order sample the input data into two streams derives order spectrum values from each tachometer which greatly simplifies the order analysis process. This is an immensely useful feature where independent shafts are contributing to the vibrations on the test object.

Spider systems consist of two dedicated tachometer channels that can continuously record raw time data. The Spider-20 allows one of the input channels to be used to record data from the second tachometer.



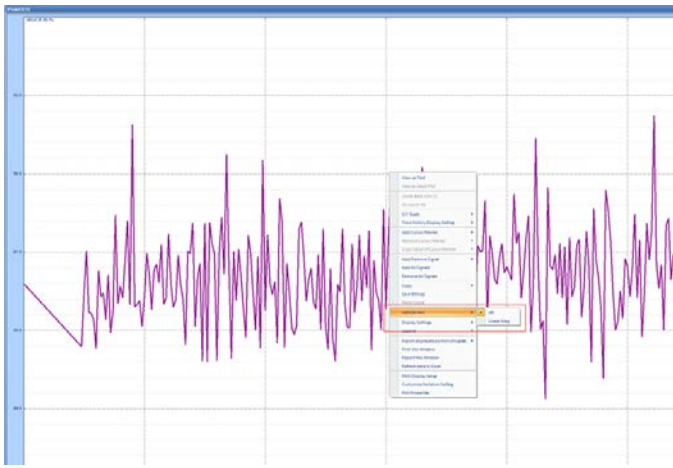
Post Analysis (PA) perform Order Analysis with this data by simultaneously using both tachometers. Two sets of order analysis signals are available for each channel, including the order spectrum, band RMS spectrum and order tracks.

NEW FEATURES

New Features in EDM Dynamic Signal Analysis

Ability to Plot Sound Pressure Time Data in dB

Sound pressure data is typically analyzed through octaves and is typically displayed in dB with reference to 20 μ Pa. In some applications, such as measuring the instantaneous sound pressure levels from a gunshot or a blast, it is necessary to display the time data in dB to easily identify the instantaneous sound pressure levels.

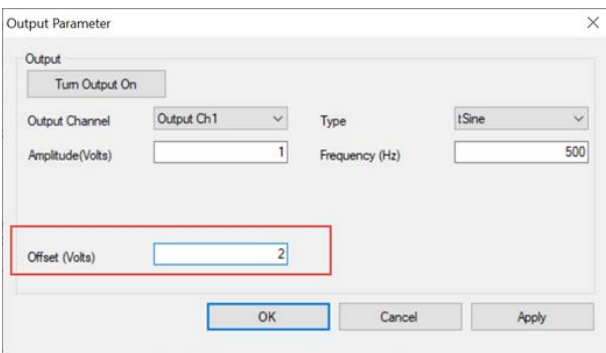
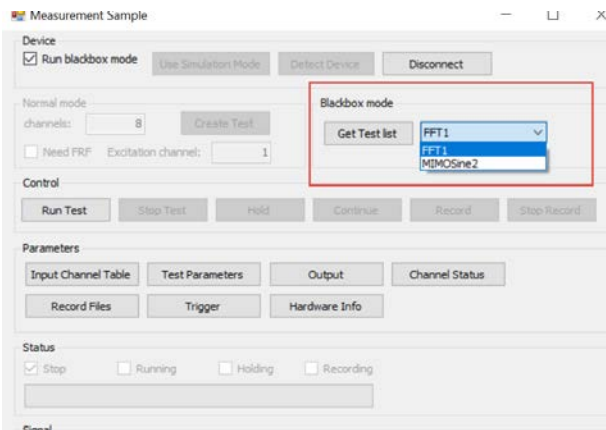


EDM 9.1 introduces a feature to display the Peak/RMS Sound Pressure level time data to be plotted using dB.

DSA API Capability to Select and Run Black Box Tests

Black Box mode is the most powerful mode offered by Crystal Instruments where a Spider can run independently of a PC and still perform all calculations in addition to saving and recording processed or raw signal data.

EDM also has an option to define several tests or configurations and upload it to Black Box mode. With EDM 9.1, the API now has the ability to select one of the desired configurations and run the Spider in the Black Box mode.

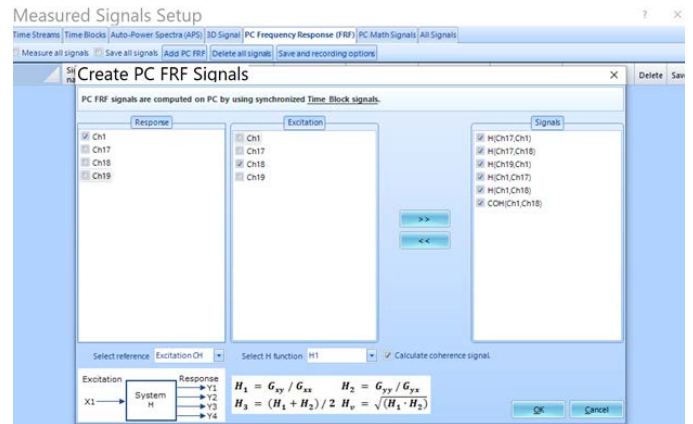


This greatly simplifies running tests and acquiring data from Spider through customized or integrated software applications.

Other notable enhancements to the API include the ability to select the DC Offset to be output along with the desired signal.

Introducing PC FRF Signals with Spider-80SG/SGi

The new EDM 9.1 allows PC FRFs to be computed on the Spider-80SG channels and also cross computed between the channels of the Spider-80SG, Spider-80SGi and the Spider-80Xi. Under **Setup->Measured Signals->PC Frequency Response (FRF)**, the various combinations of FRF signals to be calculated can be added. Coherence between these channels can also be calculated.



Digital Inputs to Enable/Disable Specific Limit Checks

The alarm limit feature in EDM-DSA is a widely used feature for production testing to qualify a product. Dynamic signal analysis (DSA) allows users to create multiple limits for each signal on each channel.

When deployed under production testing, it is much easier to use digital Inputs on the Spider to designate certain actions. One of the primary actions is to enable or disable certain limit checks to ensure that limits are being compared to only the desired signals at any time.

Signalmame	Limit name	Event strings	Strings when pass	Strings when fail	Line width	Line color	Limit check on	Limit check off	Action when exceeded
Ch1	Ch1_Limit	Product Line 1 high alarm	Pass	Fail	2:5	Red	Input #1 High	Input #1 low	Output #5
Ch2	Ch2_Limit	Product Line 2 high alarm	Pass	Fail	2:5	Red	Input #2 High	Input #2 low	Output #6
Ch3	Ch3_Limit	Product Line 3 high alarm	Pass	Fail	2:5	Red	Input #3 High	Input #3 low	Output #7
Ch4	Ch4_Limit	Product Line 4 high alarm	Pass	Fail	2:5	Red	Input #4 High	Input #4 low	Output #8

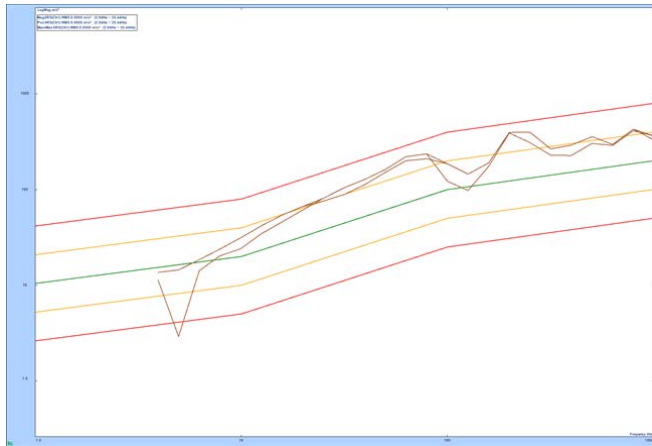
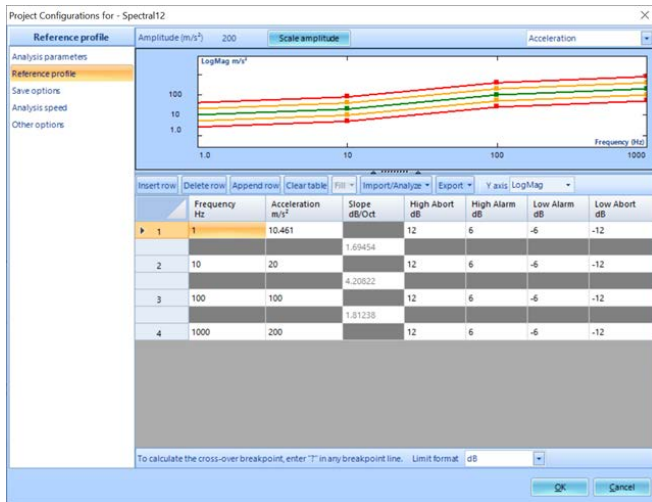
This new feature in EDM 9.1 allows users to select specific digital inputs to enable or disable each limit.

Thus, users can configure all the desired limits and enable or disable them using only digital signals and without having to use EDM software. This ensures switching limits is a seamless and fast process as desired by those working in a production line test setup.

New Features in Post Analyzer

SRS Reference Profile Includes Alarm and Abort Limits

Post Analyzer now includes SRS-Alarm and Abort limits. This allows users to define two levels of thresholds.

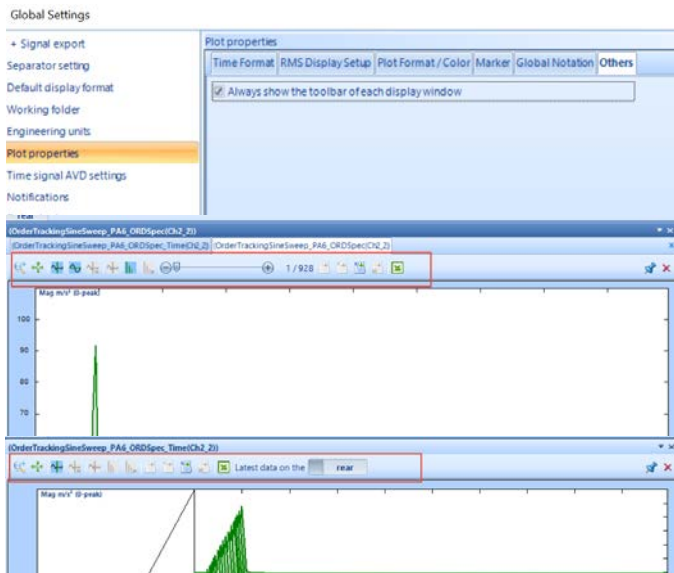


Both the upper bound and lower bound reference limits can be defined for alarm and abort limits.

Dock the Signal Display Toolbar by Default

Post Analysis operations typically require the graphics display toolbar which provides users with a convenient menu to modify the display parameters, move through several frames of saved signals, zoom in/out, plot cursors/markers, etc.

Docking the toolbar by default makes it very convenient to use the most basic operations with ease.

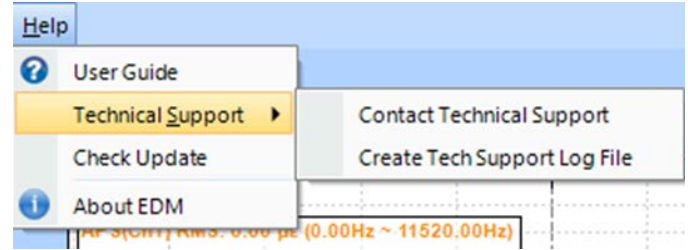


PA 9.1 provides an option that docks the signal display toolbar by default instead of having to manually dock it to each signal window.

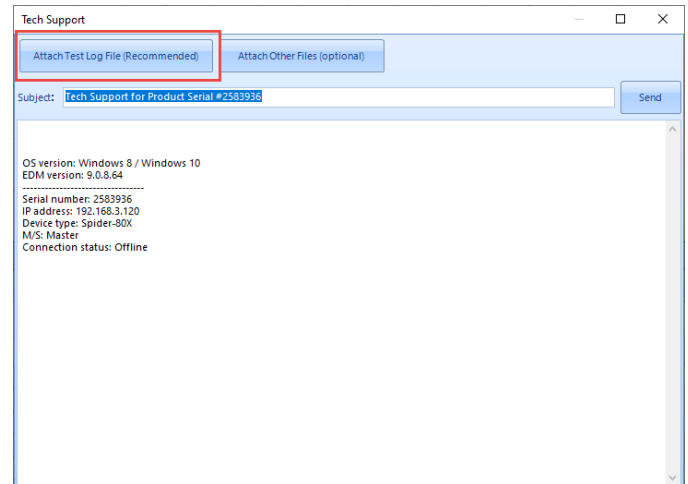
New General Features

Introducing a Tech Support Log File

Providing excellent technical support is a primary goal at Crystal Instruments. Software enhancements are developed to enhance and simplify technical support for users and technical support staff to understand and quickly resolve issues.



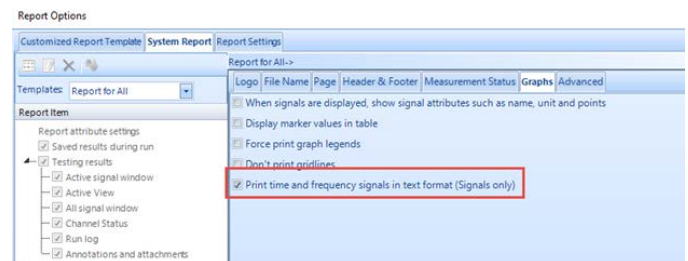
A newly added feature allows users to pack all the important data necessary for technical support. With one click, users can send essential PC information, crash logs, and application logs along with test and user settings through EDM software.



An automated email can send out with the test log file to enable quick and efficient technical support.

Introducing Reports with Signals in Text Format

Reports (Word/PDF/XML) can now consist of signals in text format in addition to the supported graphically formatted reports.



Test parameters
 Frame: 298
 Block Size/Line: 1024 / 450
 Average number: 8

Frequency range (fa): 23 Khz
 Window: Hanning

Sampling Rate (fs): 51200 Khz
 Average mode: Exponential

(OCT(ch1),OCT(ch2),OCT(ch3),OCT(ch4), etc. [8])

Signal Name	OCT(ch1)	OCT(ch2)	OCT(ch3)	OCT(ch4)	OCT(ch5)	OCT(ch6)	OCT(ch7)	OCT(ch8)
X-Frequency (Hz)	YMag (RMS)	Pa	YMag (RMS)	Pa	YMag (RMS)	Pa	YMag (RMS)	Pa
1.0000E+001	6.9769E-005	8.3740E-005	1.2857E-004	5.3250E-005	7.7018E-005	8.8052E-005	1.2833E-004	8.0374E-005
1.2500E+001	7.1571E-005	8.4793E-005	7.9915E-005	9.8765E-005	9.9772E-005	8.0579E-005	1.0239E-004	1.0655E-004
1.6000E+001	7.6875E-005	6.3278E-005	9.4665E-005	8.1185E-005	8.6545E-005	8.7663E-005	8.6236E-005	9.1559E-005
2.0000E+001	6.7992E-005	6.9317E-005	1.3044E-004	8.5704E-005	8.0008E-005	1.0030E-004	7.6000E-005	7.5440E-005
2.5000E+001	8.1437E-005	8.0335E-005	1.0324E-004	9.0098E-005	8.8643E-005	7.1335E-005	9.0805E-005	1.1561E-004
3.1500E+001	8.5949E-005	1.0534E-004	9.7519E-005	1.1277E-004	1.3213E-004	9.6525E-005	1.0815E-004	1.0016E-004
4.0000E+001	7.6134E-005	1.0011E-004	8.7693E-005	8.5186E-005	9.5179E-005	9.4383E-005	1.0553E-004	1.0753E-004
5.0000E+001	1.1617E-004	1.0581E-004	1.1950E-004	1.1981E-004	1.0767E-004	1.2049E-004	1.0091E-004	1.1027E-004
6.3000E+001	4.3070E-004	4.2256E-004	4.1593E-004	3.5091E-004	2.8844E-004	2.8028E-004	2.4400E-004	3.3043E-004
8.0000E+001	1.0164E-004	1.0491E-004	1.1543E-004	1.1322E-004	1.0601E-004	9.9435E-005	1.0676E-004	8.8418E-005
1.0000E+002	1.0857E-004	1.0976E-004	1.1859E-004	1.2524E-004	1.2958E-004	1.0270E-004	1.1018E-004	1.0128E-004
1.2500E+002	1.2343E-004	1.0987E-004	1.1591E-004	1.3109E-004	1.1316E-004	9.8287E-005	1.3443E-004	1.1958E-004
1.6000E+002	4.9558E-004	1.1488E-004	1.2502E-004	1.2254E-004	1.2819E-004	1.2487E-004	1.3003E-004	1.2044E-004
2.0000E+002	7.5609E-004	1.2390E-004	1.3864E-004	1.4025E-004	1.2331E-004	1.2377E-004	1.3329E-004	1.1944E-004
2.5000E+002	3.0604E-004	1.3975E-004	1.4454E-004	1.4627E-004	1.4627E-004	1.5320E-004	1.3967E-004	1.4325E-004
3.1500E+002	1.2902E-003	1.4696E-004	1.6357E-004	1.6735E-004	1.5132E-004	1.6193E-004	1.6066E-004	1.5208E-004
4.0000E+002	1.3692E-003	1.6230E-004	1.7475E-004	1.7399E-004	1.6562E-004	1.6858E-004	1.7204E-004	1.7417E-004
5.0000E+002	1.1566E-003	1.7372E-004	1.8578E-004	1.8414E-004	1.9952E-004	1.8755E-004	1.8414E-004	1.8685E-004
6.3000E+002	8.7960E-004	1.9438E-004	2.0643E-004	2.0561E-004	2.0340E-004	2.0837E-004	2.1058E-004	2.0671E-004
8.0000E+002	4.5974E-004	2.1835E-004	2.2879E-004	2.3447E-004	2.2874E-004	2.3516E-004	2.2880E-004	2.3381E-004
1.0000E+003	9.0615E-004	2.5085E-004	2.6747E-004	2.5768E-004	2.5332E-004	2.6790E-004	2.4998E-004	2.4709E-004
1.2500E+003	9.1835E-004	2.5165E-004	3.0804E-004	2.8169E-004	2.8502E-004	2.8901E-004	2.9297E-004	2.7916E-004
1.6000E+003	7.4060E-004	3.1963E-004	3.4011E-004	2.9852E-004	3.1469E-004	3.1120E-004	3.0495E-004	3.0375E-004
2.0000E+003	7.2891E-004	3.6026E-004	3.5775E-004	3.3581E-004	3.4697E-004	3.7333E-004	3.3461E-004	3.6148E-004
2.5000E+003	7.6283E-004	3.9627E-004	4.0532E-004	3.8454E-004	3.8721E-004	4.2125E-004	4.1139E-004	3.6880E-004

Block(Ch1Wire)

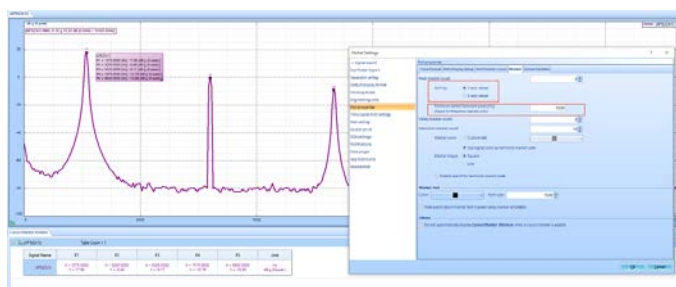


Signal Name	Engineering Unit	Max Value	Min Value	RMS	Signal Type	Block size/Lines	Measurement time
SIG0107_Block(Ch1Wire)	g	2.0206	-0.3164	0.2062	Time Block	2048	Jan-13-2021 10:16:09
SIG0125_Block(Ch1Wire)	g	2.0199	-0.3162	0.2063	Time Block	2048	Jan-13-2021 10:34:29
SIG0126_Block(Ch1Wire)	g	2.0197	-0.3162	0.2062	Time Block	2048	Jan-13-2021 10:34:30
SIG0115_Block(Ch1Wire)	g	2.0191	-0.3174	0.2061	Time Block	2048	Jan-13-2021 10:30:22
SIG0104_Block(Ch1Wire)	g	2.0208	-0.3167	0.2062	Time Block	2048	Jan-13-2021 10:16:07
SIG0117_Block(Ch1Wire)	g	2.0204	-0.3164	0.2061	Time Block	2048	Jan-13-2021 10:30:23

For signals such as SRS or octave, it is convenient to print the report in the text format for easier reading and to run automated scripts when needed.

Introducing the Enhanced Peak Marker Functionality

The EDM 9.1 release significantly upgrades the Peak Marker function.

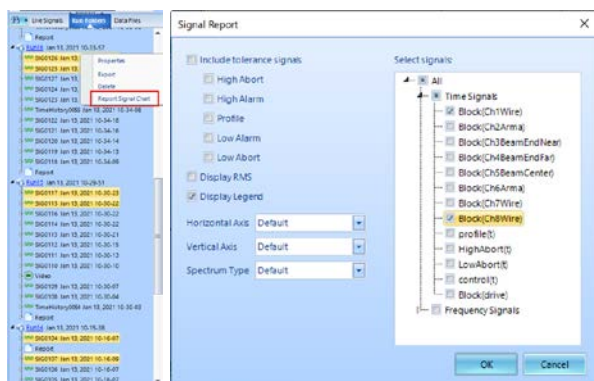


Options are available to pick peak markers with respect to the amplitudes or time/frequency axis. This feature greatly customizes the selection of peaks, especially on a spectrum, where either the peaks of amplitude or the peaks in the low frequency zone are of interest.

In addition, an option is also available to define a delta f between the detection of peaks. This successfully avoids the detection of peaks caused by noise and points to peaks of interest.

Introducing Overlay & Comparison of Same Signal from Different Run Folders to a Report

EDM 9.1 introduces a convenient way to overlay the same signal of the same channel from multiple run folders and allows users to create a report.



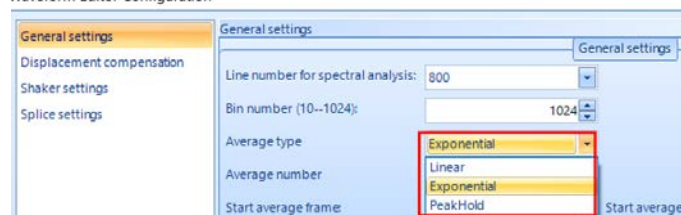
This feature is primarily helpful in the VCS tests to conveniently view the difference between the same signal during multiple runs.

It is also helpful in DSA to create a report for the changes in the signal from different runs on different products.

Introducing Peak Hold Average Type in Waveform Editor

Peak hold average type is introduced in the Waveform Editor.

Waveform Editor Configuration

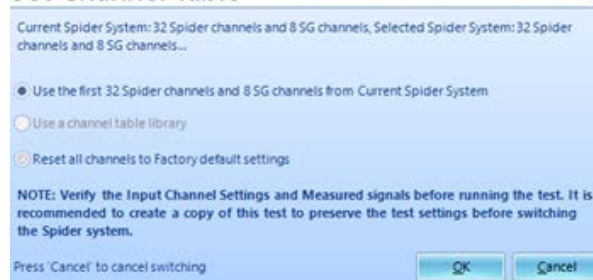


This feature allows users to compute the spectrum of a given time stream using the peak hold average.

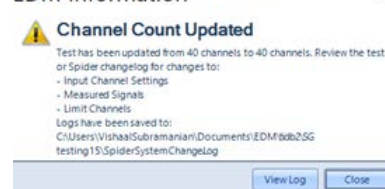
Switch Spider Systems with Spider-80SG, Spider-80SGi & Spider-80Ti Front-ends

The introduction of the new Spider-80Ti and the current Spider-80Xi and Spider-80SGi modules allow various combinations of systems to use. The new EDM 9.1 software allows users to seamlessly transition between Spider systems with ease and automatically updates the input channel settings. This helps users run old or existing tests with new capabilities such as temperature measurements.

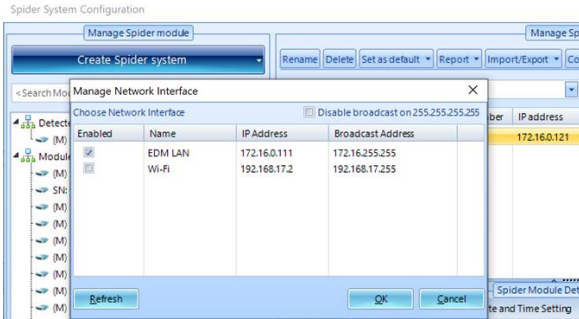
Switch Channel Table



EDM Information



Specify the Network Adapter for Communication with Spider
EDM 9.1 introduces a new feature that allows users to specify the network adapter at which a Spider is located.

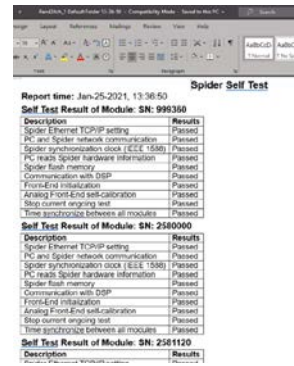
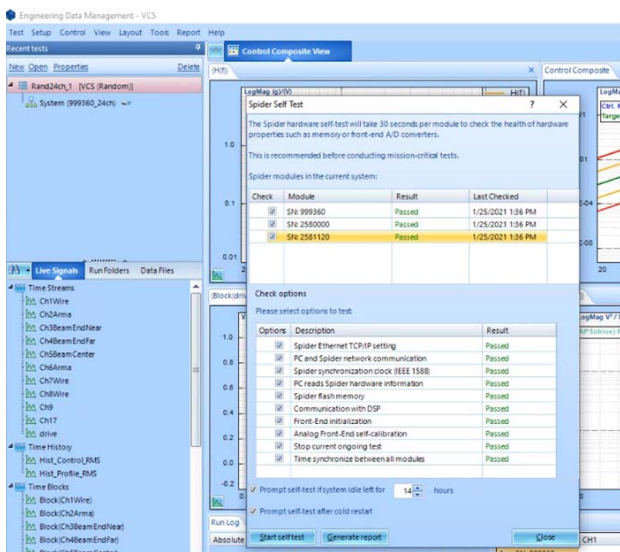
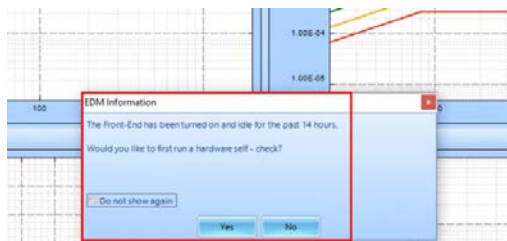


This selection allows network traffic to be routed using the selected adapter. When multiple adapters are present on a computer, EDM typically selects the default adapter or the adapter with the highest priority metric.

With this introduction, users can select a non-default network adapter while other apps on the PC use the default network adapter for communication, which allows internet applications and EDM to run seamlessly.

Introducing Hardware Self-Test Reminders Feature

Users should ideally perform a hardware self-test on a Spider unit after it has been idle for a very long time. There are also times when it is important to perform a hardware self-test on a Spider after a cold start.



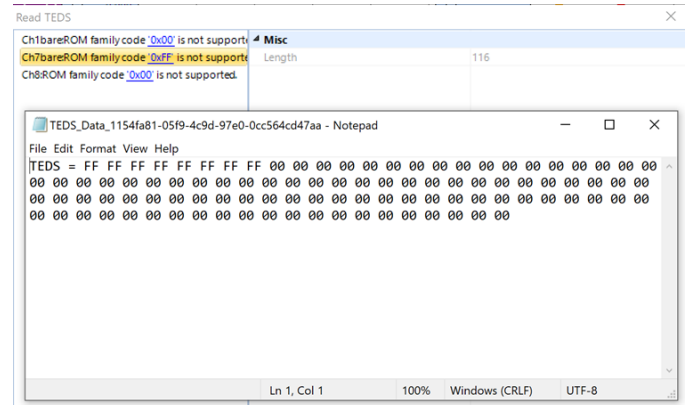
A hardware self-test ensures that all components of the hardware are working well and ensures the accuracy of the measurements. Minor drifts in the ADCs are also corrected to ensure highly accurate measurements.

This new feature helps users identify scenarios where a hardware self-test is needed and performs the hardware self-test upon a user's input.

Automatically Save Error Code When TEDS Detection Fails

The TEDS feature in EDM is provided for sensors with TEDS capabilities. The automatic detection of sensitivity reduces the user's time to configure the input channel setup.

TEDS detection can fail due to a variety of reasons. This new feature in EDM automatically creates a text log to represent the channels that failed along with the error code.



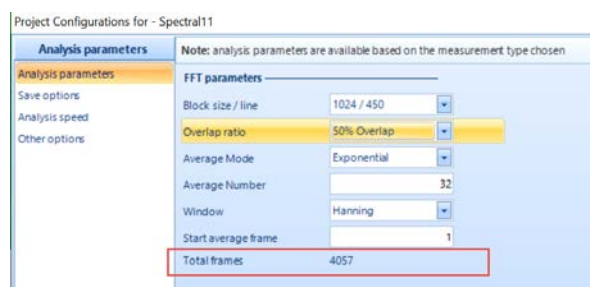
In a high channel count system setup, this convenient feature helps users identify the failed channels and take necessary actions.

MAJOR IMPROVEMENTS

Post Analyzer

Analysis Parameters Displays the Total Frame Count

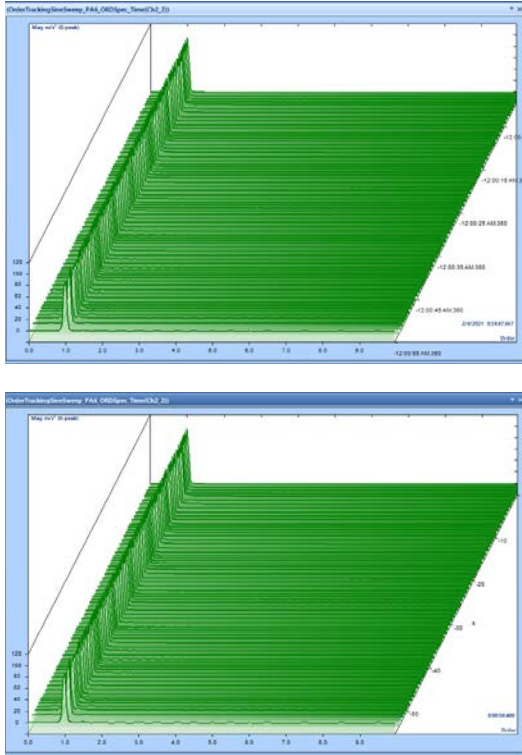
PA now displays the total frame count for a signal that will be processed for the block size and overlap selection.



This enables a convenient adjustment of the Average Number for some applications requiring an averaged spectral analysis for the entire time domain data.

Display Absolute or Relative Time for Reference Axis of 3D Signals

In 3D signals with time as the reference axis, the ability to display the absolute time or the relative time is added.



When analyzing data for long time durations, it is easier now to identify the absolute or relative time of the desired event(s).

General Improvements Monitor the Network Traffic

Users can monitor network traffic on EDM 9.1

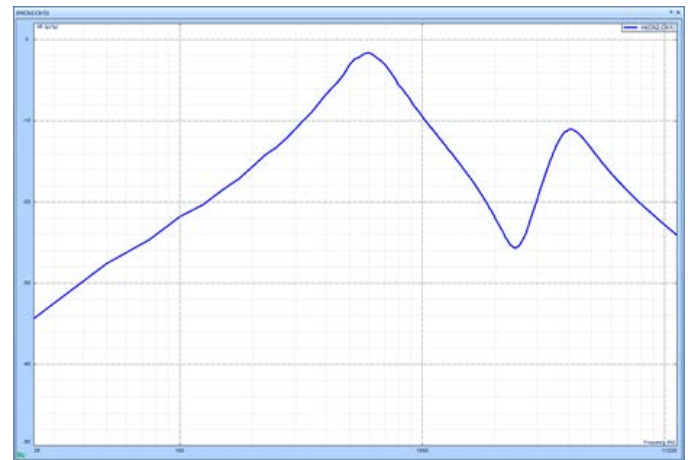
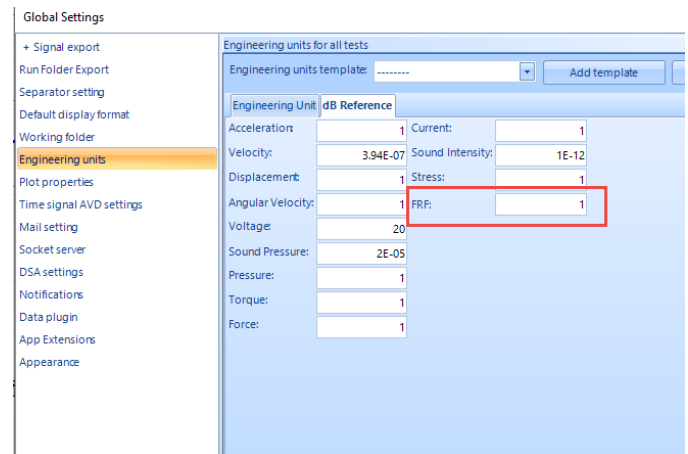


This feature allows users to monitor the network traffic and ensure that sufficient bandwidth is available for EDM to communicate with the Spiders. When the bandwidth gets low, it is advisable to close other programs to ensure seamless communication and a clear display of data transmitted to EDM.

Display FRF Signals in dB with Customized Reference

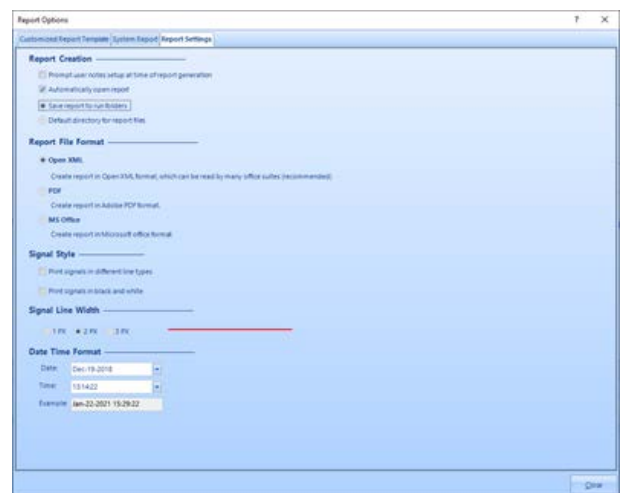
Users can now display FRF Signals in dB with a customized dB

reference.



Report Enhancements - Saving Reports to Customized Locations (including Run Folder)

Location to automatically save reports is easily customized and includes option to save report to the Run Folder.



Auto Download and Auto Export Recordings to Customized Formats

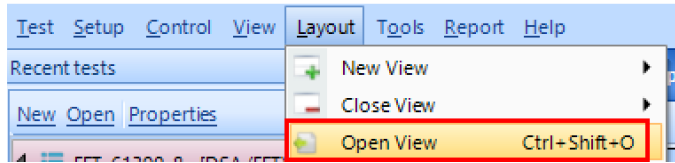


The option to automatically download time stream recordings at the end of a test and to auto export to a user selected format is now available across all EDM software modules.

“Open View” Supports Multiple Tabs & Files

Open View in EDM now allows users to open multiple files or tabs.

Engineering Data Management - DSA



This allows users to conveniently configure and save multiple display tabs and then open them in a different test type.

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	2/02/2019
Release	EDM 8.1	CI 8.1.0.1	11/13/2019
Release	EDM 9.0	CI 9.0.0.4	06/05/2020
Release	EDM 9.1	CI 9.1.0.0	02/03/2021

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 9.1.0.x	9.1.0.x
Spider-81 (v7.x)	
EDM Testing 9.1.0.x	9.1.0.x
Spider-81B (v7.x)	
EDM Testing 9.1.0.x	9.1.0.x
Spider-80SG/SGi	
EDM Testing 9.1.0.x	9.1.0.x
Spider-20/20E/20HE/20H/20i	
EDM Testing 9.1.0.x	9.1.0.x

Product and Software Version	Firmware Versions
CoCo-80	
EDM 6.0.2.x	4.0.x
CoCo-70X	
EDM Testing 9.1.0.x (EDM CoCo for DSA)	2.0.x
Vibration Diagnostic System 1.4.2.x	2.0.x
CoCo-80X/90X	
EDM Testing 9.1.0.x (EDM CoCo for DSA)	2.0.x