

EDM 6.1

ENGINEERING DATA MANAGEMENT SOFTWARE

EDM 6.1 Release Notes | Vibration Control Systems & Dynamic Signal Analysis



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RELEASE HIGHLIGHTS

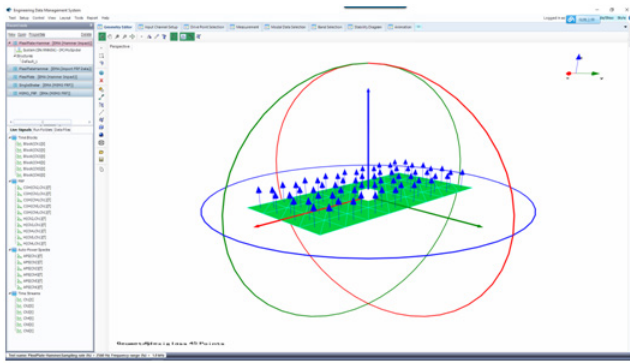
Introducing EDM Modal for Experimental Modal Analysis (EMA)

EDM Modal is a complete Modal Testing and Modal Analysis suite for Experimental Modal Analysis (EMA). EDM Modal was developed based upon the sophisticated technologies of modern modal analysis theory and technique. With its intuitive controls and powerful features, EDM Modal is the ultimate tool for modal analysis applications. An intuitive interface allows users to manage highly complicated tests that can involve hundreds of measurement points and multiple excitations. This interface also allows for simple tests to be conducted quickly and with little effort. Regardless of how complicated the modal test is, EDM Modal provides exactly the right tools to achieve your goal.

Features in EDM Modal

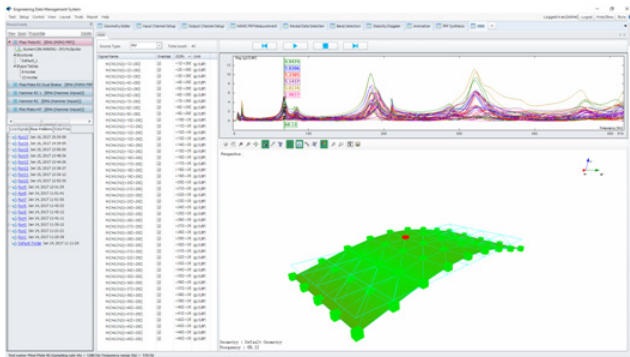
Geometry/ODS/Animation

EDM Modal Geometry/ODS/Animation is the primary EDM Modal software module, provides fast and efficient structural model generation and full 3D visualization of test and analysis results.



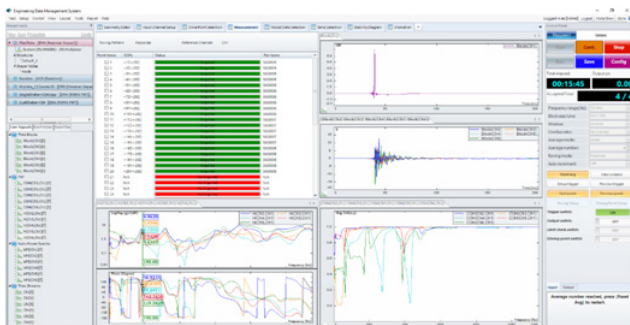
Operational Deflection Shape Analysis

EDM Modal Operational Deflection Shape (ODS) is a feature that allows users to better visualize the deformation of the structure under test.



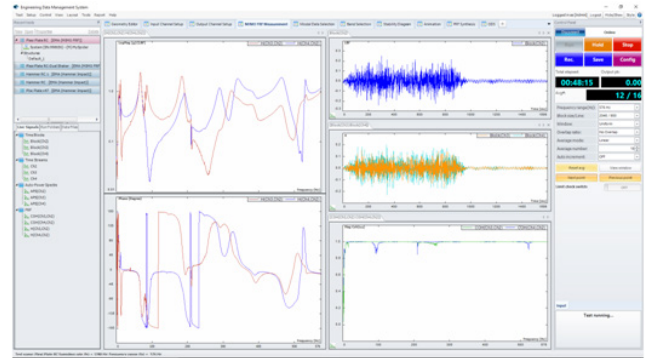
Hammer Impact Testing

EDM Modal Hammer Impact Testing provides the necessary features for a single-operator experimental modal test.



SIMO FRF Testing

EDM Modal SIMO FRF Testing includes a dedicated test setup and operation process flow using a single shaker to acquire FRF signals.

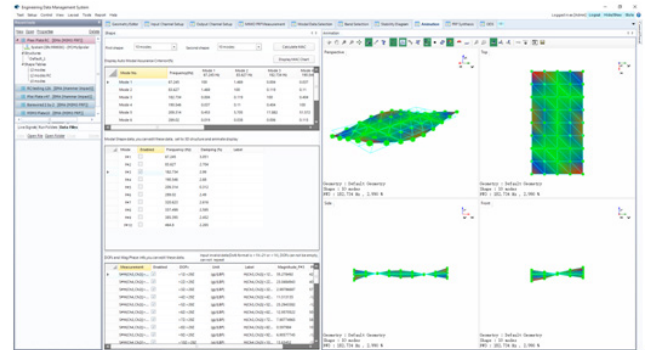


MIMO FRF Testing

EDM Modal MIMO FRF Testing includes a dedicated test setup and operation process flow using multiple simultaneous shakers to acquire FRF signals.

Standard Modal Analysis

EDM Modal Standard Modal Analysis provides the user with a complete arsenal of tools, from FRF data selection and parameter identification to results validation and mode shape animation.



Advanced Modal Analysis

EDM Modal Advance Modal Analysis includes all the features of Standard Modal Analysis, as well as Poly-reference modal analysis

NOTE: Detailed feature list with description released in 6.1 version under EDM – Modal is listed in a separate document. Refer to “CI EDM Release Notes 6.1 Modal” document.

Introducing New Hardware: Spider-100

Spider-100 is Crystal Instruments' latest contribution to vibration testing. It is the only controller in the world that controls temperature, humidity, and vibration harmonically in a chamber and shaker system. Control accuracy of temperature, humidity, and vibration are achieved by Spider-100 in an integrated design to simulate the actual physical environment.

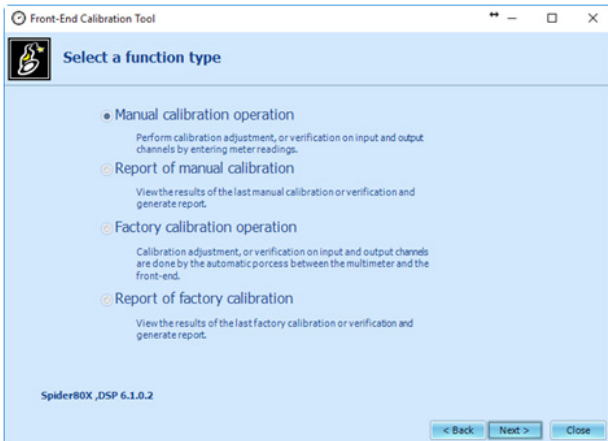
Various input and output interface provides the maximum flexibility to control many shaker and chamber systems.



Introducing Stand-alone Front End Calibration Tool (FECT)

The voltage and charge calibration function are moved to the Front-End Calibration Tool software. The user enters measurement readings from a meter connected to a supported front-end and FECT performs calibration on it.

In addition, FECT provides the "Factory Calibration" mode, where measurements are automatically taken at different frequencies and voltages in the entire frequency range during the calibration process through communication between FECT, the front-end, and the meter.



Supports Spider-80Xi in VCS Mode



The Spider-80Xi is a compact version of Spider-80X. The mechanical design of Spider-80Xi eliminated the enclosure of each modular card inside of chassis. Light weighted, it is ideal for the applications that the portability and size are critical to the usage while exchangeability of cards is not required.

Spider-80Xi was introduced in 6.0 release as a dynamic signal analyzer. In this release, Spider-80Xi may serve as a high-channel count vibration control system.

Supports SQL Server 2014

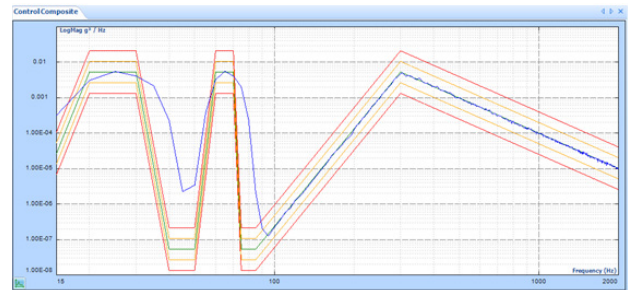
EDM now supports databases on both SQL server 2008 R2 and SQL server 2014 database management systems. Databases and tests created in SQL server 2008 R2 can be imported to SQL server 2014. The opposite does not apply.

Multi-Resolution Random

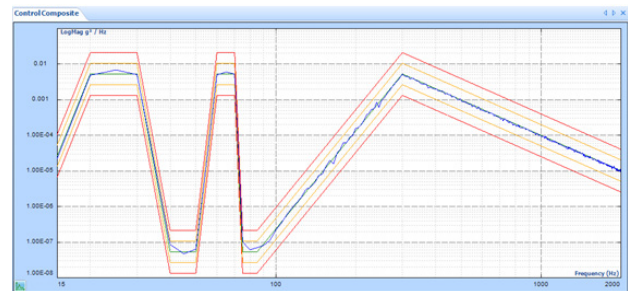
Some profiles have more detail or greater sharpness in the low frequency range where regular random control systems do not provide enough detail (because of uniform frequency resolution) and the control performance is impacted.

The multi-resolution control algorithm enhances higher resolution in the low frequency range to provide much higher control accuracy in that range.

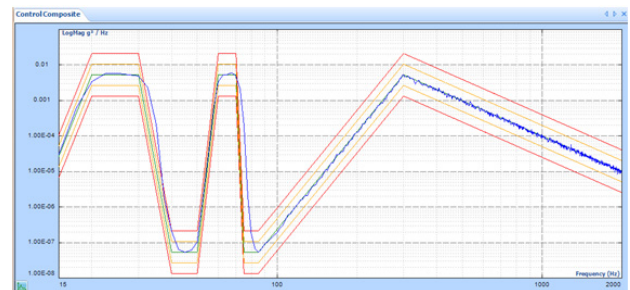
Line = 400, without multi-resolution



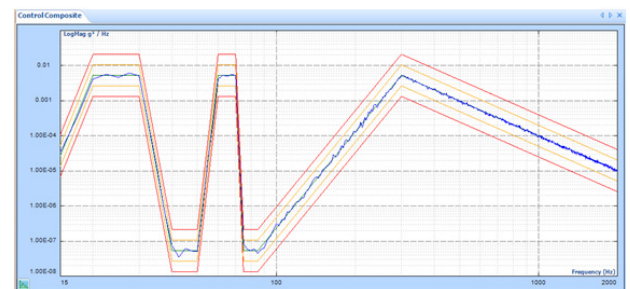
Line = 400, with multi-resolution enabled



Line = 800, without multi-resolution

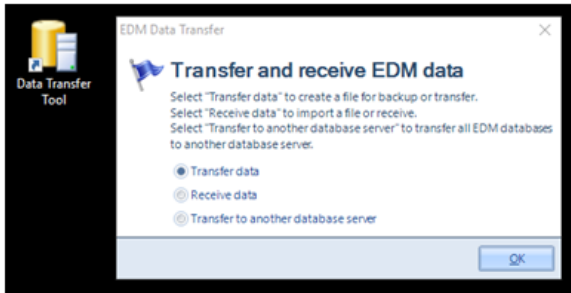


Line = 800, with multi-resolution enabled



Introducing Data Transfer Tool

Data transfer tool is included in the EDM installation. The tool provides the user an easy way to transfer all EDM databases, including saved/recorded signals in run folders, global parameters, and all other settings, from one computer to another over network or storage media.



64-bit EDM

EDM now supports both 32-bit and 64-bit Windows. EDM will be able to access more RAM on a computer to further improve performance.



Introducing New Breakout Box for Spider-80SG (Supports 3 Wire Connections)



3-wire configurations help to compensate the wire resistances associated with the strain gages and also compensate for the changes in the wire resistances due to temperature or other factors during the course of the test.

A modified version of the breakout box enables direct connections for 3-wire Quarter Bridge configuration. Dummy resistors of 120 Ω and 350 Ω are incorporated into the breakout box making the connections for 3-wire configuration simple. The third wire needs to be simple connected to either the 120 Ω/350 Ω pin.

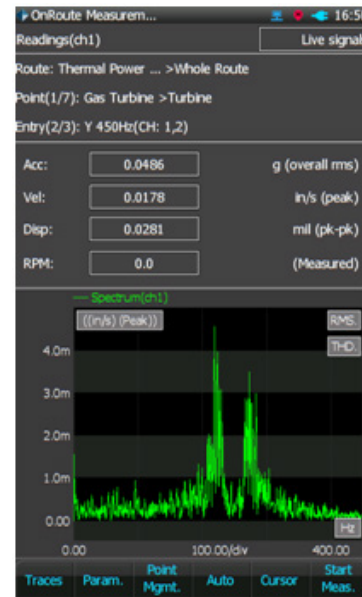
Introducing Python API

A Spider system operating in Black Box mode is now controllable using Mac or Linux operating systems with the help of Python API.

Key features include: starting and stopping the test, controlling the recording and saving operations and downloading the saved or recorded files from the Spider internal memory.

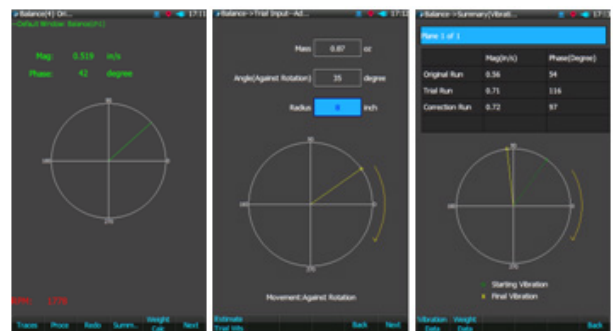
New Features in CoCo-80X (with ECX 1.2.0)

Introducing Vibration Data Collector (VDC) Mode for CoCo-80X



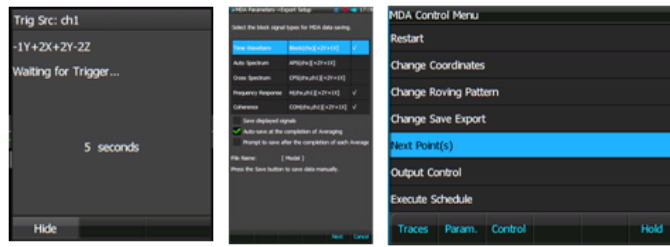
VDC Mode is designed for predictive maintenance applications. While operating in VDC Mode, the CoCo-80X serves many different purposes for field measurements – data collection and factory/route/database management. EDM is used to create and maintain hierarchical databases of all machines and data for condition monitoring within a facility. Routes are defined within the EDM software. Factory and route information must be uploaded to the CoCo, and measurement data must be downloaded to EDM for post processing, storage, analysis, trending, and reporting.

Introducing Rotor Balancing for CoCo-80X



Rotor balancing allows correcting the unbalance without having to dismantle the machine. It is possible to balance rotors of any size with either 1 or 2 plane balancing. Using the 'multiple channel' option, parallel measurements on 2 sensors are possible, resulting in a faster, safer and more accurate procedure. The user interface allows stopping and starting balancing as wanted and to perform again any single operation without running the whole procedure.

Introducing Modal Data Acquisition (MDA) for CoCo-80X

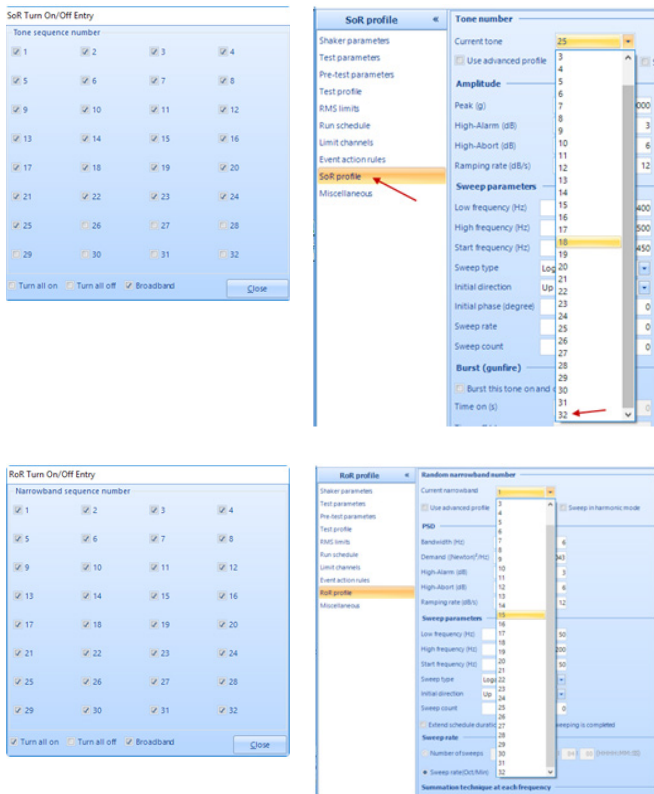


Modal Data Acquisition (MDA) is a dedicated user interface for entering impact testing coordinates during testing. Geometric coordinates are stored in the file header, allowing easy importing into supported modal mode

New Features in EDM Vibration Control Software

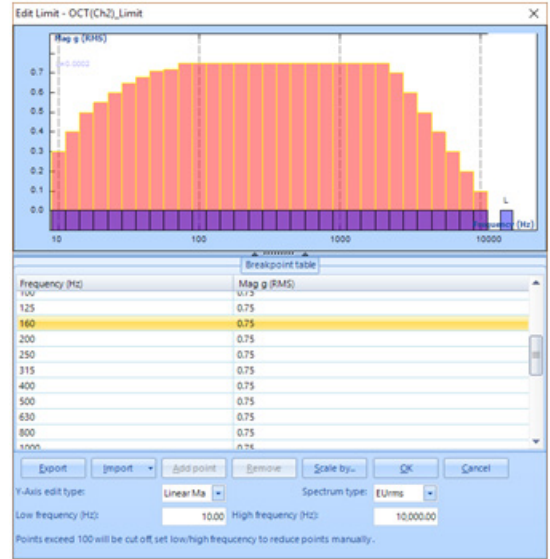
Number of SoR/RoR Tones Increased to 32

When only SoR or RoR is enabled in a Random test, the number of tones (SoR) or narrowbands (RoR) can be up to 32.



higher frequencies for all the input channels.

Introducing Octave and FRF Limits

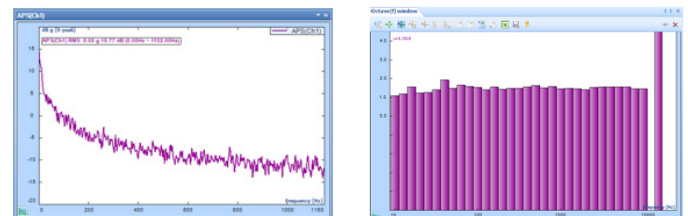


Limits can now be set on individual Octaves and the Magnitude of FRF signals. Limits are implemented on DSP making the limits capable of running even in the black box mode.

Introducing Output Signal type: Pink Noise

Output Channels for FFT17 (DSA/FFT)

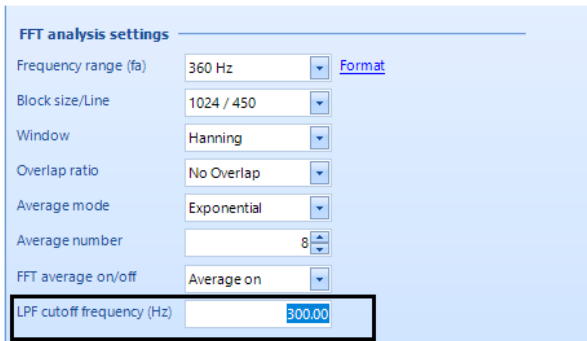
Module	Output CH	On/Off	Output type	Setup	Info
1	SH: 2583936	Off	Pink Noise	RMS: 1.000V	
2	SH: 2583936	Off	Pink Noise	RMS: 1.000V	



Pink noise, which is a type of white noise that has equal energy in each octaves, is now available as an output type.

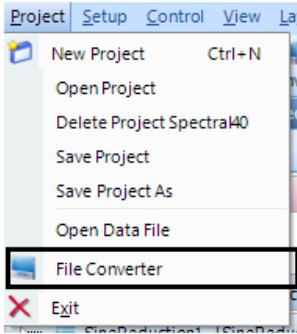
New Features in EDM Dynamic Signal Analysis

Introducing Low Pass Filtering of Input signals



User can now define a Low Pass Filter (LPF) for filtering out the

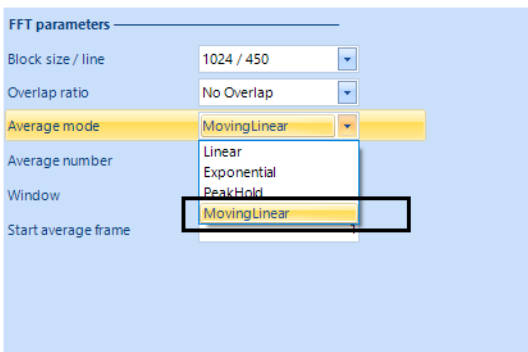
New Features in Post Analyzer
File Converter Merged with Post Analyzer



Post Analyzer can be used with signal files recorded on a variety of instruments using a variety of acquisition devices. File Converter is a convenient platform to convert a range of file types to AFX file type (common file type used for EDM and PA).

With the integration of File Converter with the Post Analyzer, files can be easily converted from within the Post Analyzer.

Introduced Moving Linear Average in Post Analyzer

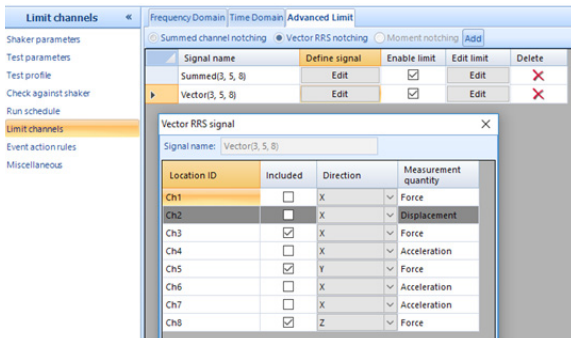


Moving Linear Average also called rolling linear average is now introduced in PA. With this option, linear averages are computed for the selected frame count and the test does not pause when the average number is reached. Instead, the test continues computing the linear average of the most recent frame number similar to the Exponential averaging mode.

MAJOR IMPROVEMENTS

Advanced Notching in Sine

Two advanced notching implemented in Sine are Summed force notching and RSS vector notching.

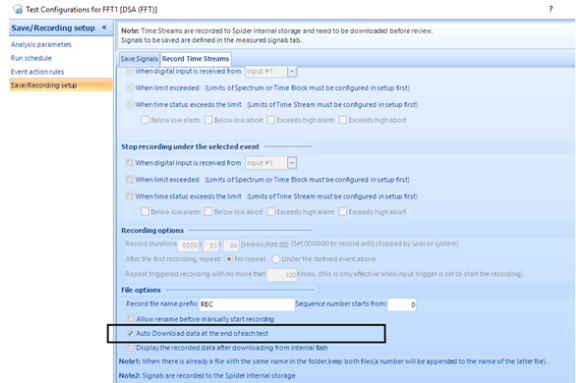


Summed force notching: at frequencies where the sum of se-

lected response signals would exceed the given limits if the input acceleration specification were followed, the input acceleration is reduced.

RSS vector notching: at frequencies where the vector amplitude of response signals in different directions would exceed the given limits if the input acceleration specification were followed, the input acceleration is reduced.

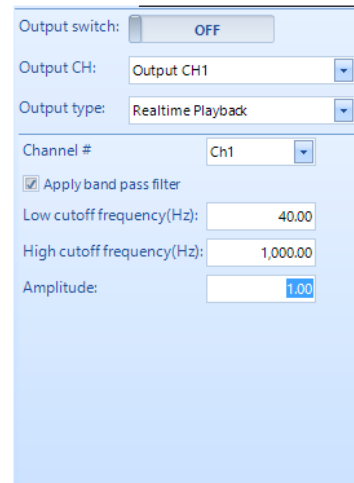
Auto Download Data from Internal Flash



As soon as the test ends, recordings from the internal flash can now be auto downloaded without having to manually select and download the data.

Real Time Playback in DSA

Another output type for playing back the signal from the input channels has been introduced.

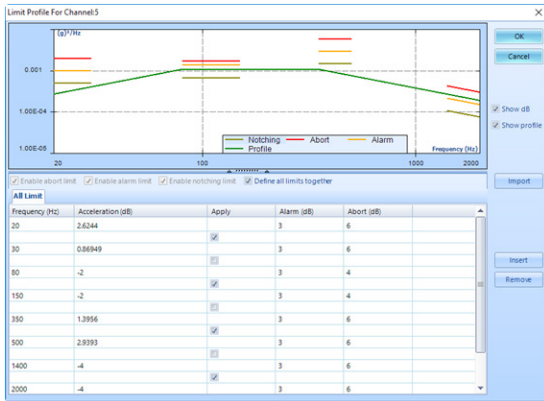


Any channel can be selected to be played back at any of the input. A band pass filter can also be applied to the output signal while playing back.

Improved Limit Editor in Random and Sine

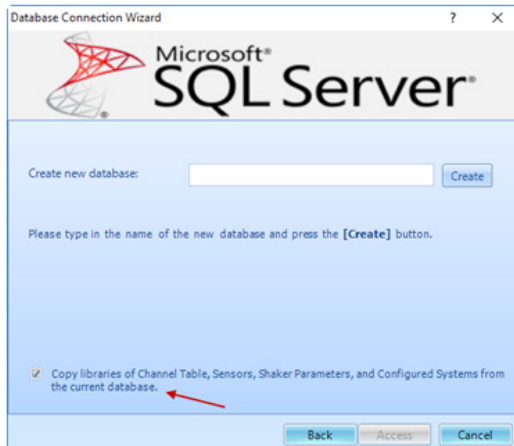
The editor of notch/abort/alarm limits in Random and Sine are greatly improved with the following features.

- Display test profile with notch/abort/alarm limits to see how they are related
- Edit limits in breakpoint table, instead of individual segment
- Display and edit limits in dB (relative to test profile) or magnitude
- Define proper default values
- Notch/abort/alarm limits can be defined individually or together to relate abort and alarm limits to notch limits
- Notch/abort/alarm limits can be imported from a CSV file and edited [24244]

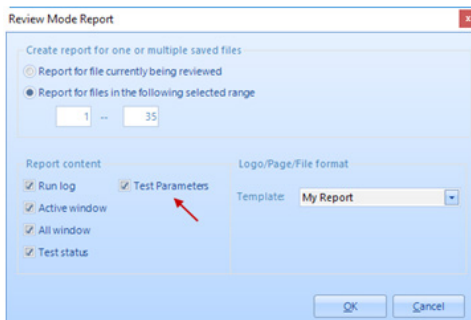


Copy Libraries and Parameters to New Database

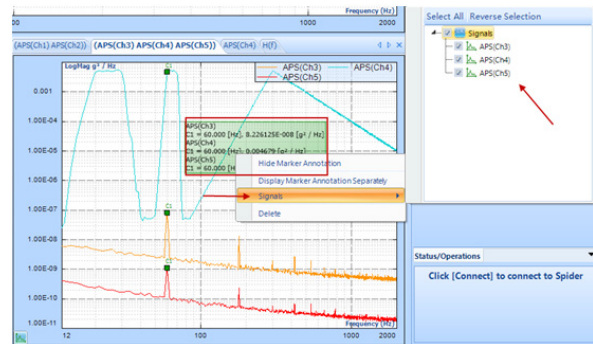
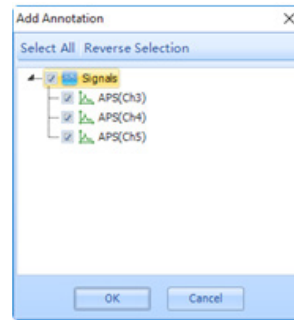
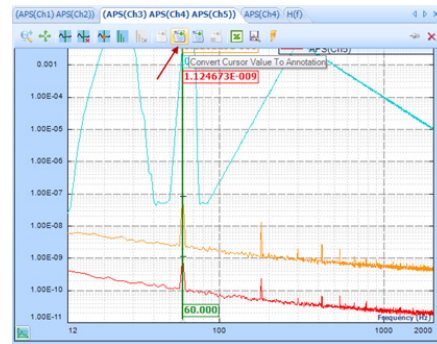
When creating a new database, copy libraries of channel tables, sensors, shaker parameters, and configured systems from the current database.



Test Parameters Included for Reports Generated in Review Mode

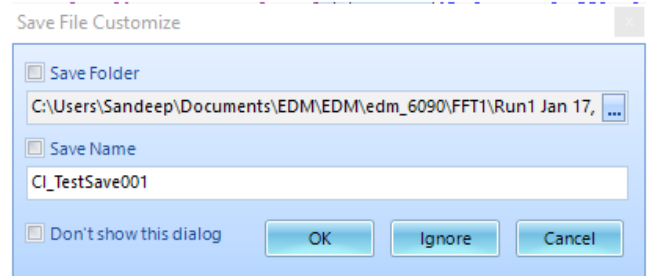
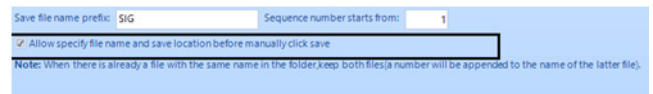


Select Signal to Add Annotation or Markers



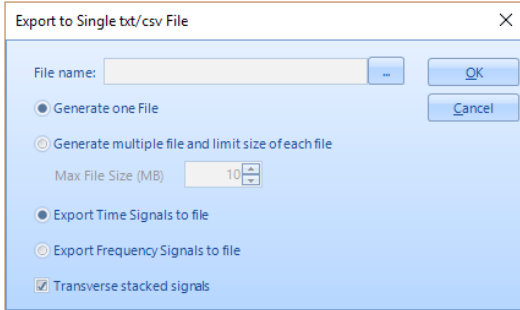
Customize File Name & Save Location for Manual Save or Record Signals

Save location and signal file name can be customized in the run time when performing each save operation by enabling the checkbox.



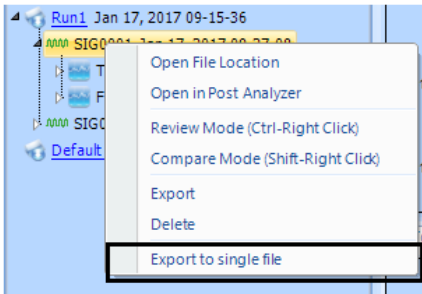
Export Time Signals & Frequency Signals as Single Files

Exporting a signal file can be better customized as per the needs.



All time signals of all channels can be exported to one file and all frequency domain signals for all channels can be exported to another file.

All options are available from the right click menu of any saved signal.



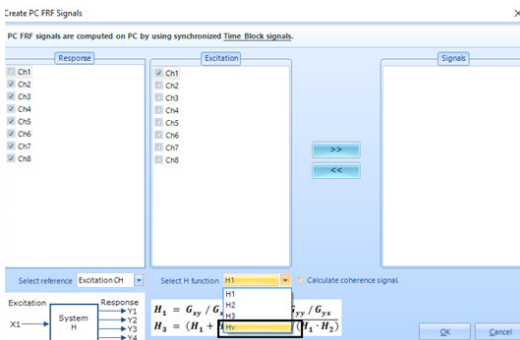
Select "Export to single file" from the menu.

Use Ctrl+c & Ctrl+v to Copy & Paste Selected Rows or Cells

Use Ctrl+c to copy selected channels or cells and Ctrl+v to paste and overwrite selected in the input channel table.

On/Off	Channel type	Location ID	Measurement quantity	Sensitivity	Input mode	Sensor	High-Pass filter Fc (Hz)
1	Control	Ch1F	Force	103.6000 (mV/Newton)	IEPE		Off
2	Monitor	Ch2D	Displacement	50.0000 (mV/mm)	DC-Single End		Off
3	Monitor	Ch3A	Acceleration	4.3030 (mV/g)	AC-Single End		Off
4	Monitor	Ch4aire	Force	101.9716 (mV/Newton)	DC-Single End		Off
5	Monitor	Ch5aire	Voltage	1000.0000 (mV/V)	DC-Single End		Off
6	Monitor	Ch6	Acceleration	100.0000 (mV/g)	AC-Single End		2.0000
7	Monitor	Ch7	Acceleration	100.0000 (mV/g)	AC-Single End		2.0000
8	Monitor	Ch8	Acceleration	100.0000 (mV/g)	AC-Single End		2.0000

Add H_v Calculation to PC FRF in Spider DSA/VCS Mode



Calculation of H_v defined as

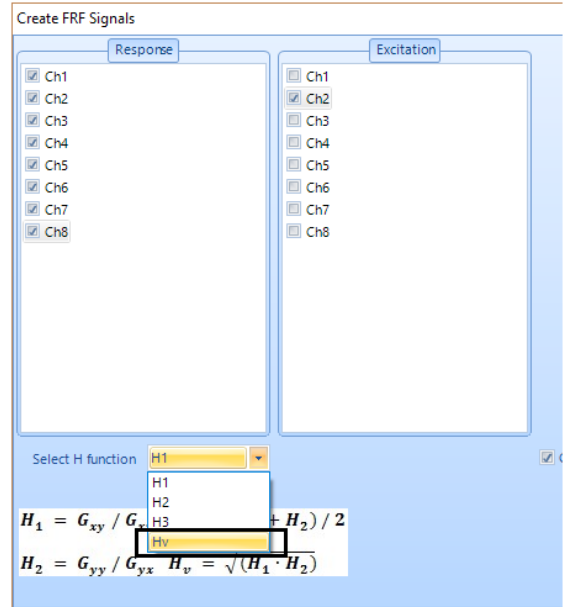
$$H_v = \sqrt{H_1 \cdot H_2}$$

has been introduced in the Spider DSA and VCS mode under PC FRF.

Add H_v Calculation to PC FRF in PA

Calculation of H_v has also been introduced in Post Analyzer, FRF calculations.

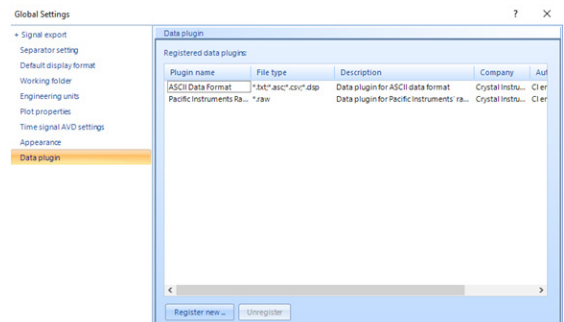
$$H_v = \sqrt{H_1 \cdot H_2}$$



PA Works Directly on Data Files Using Plug-Ins

The concept of Data Plug-Ins is introduced. PA works on post processing of data acquired from any acquisition device and it could be in any format.

The specific formats of each type of that needs to be read into PA can be defined as a Data Plug-In. The data plug-ins can be created by the user or by CI.

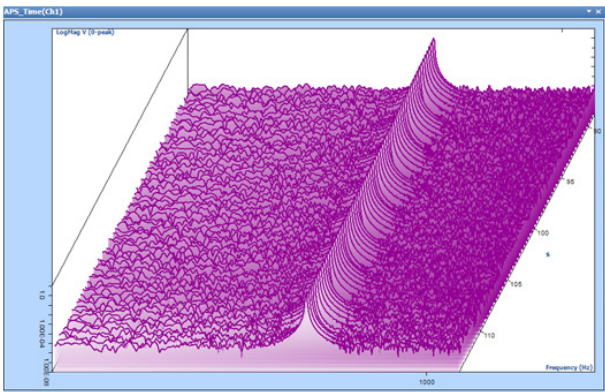
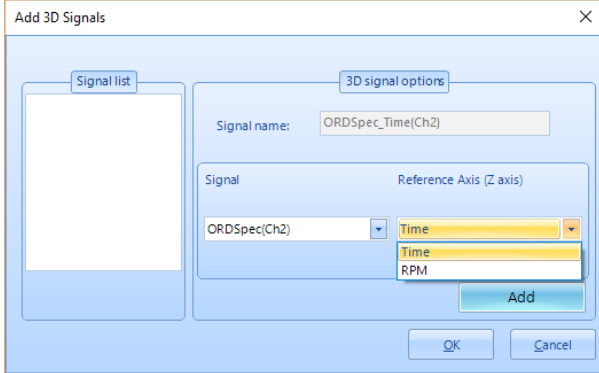
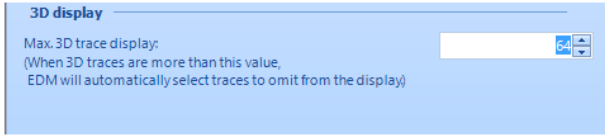


Once the format specific data plug-in is registered; PA can be used to import data from that specific format directly.

This feature opens the gates to allow hundreds of data formats to be supported on Post Analyzer.

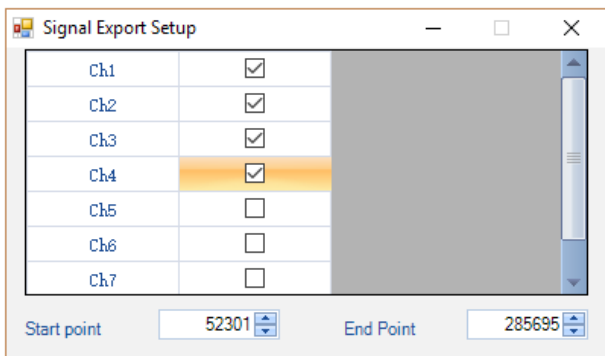
Improved Waterfall Display in PA

Option to select the number of frames of data to be included in each 3D plot is added.



The reference axis of the 3D signals can be customized with time or RPM.

Export a Segment of Data to ATFX in PA

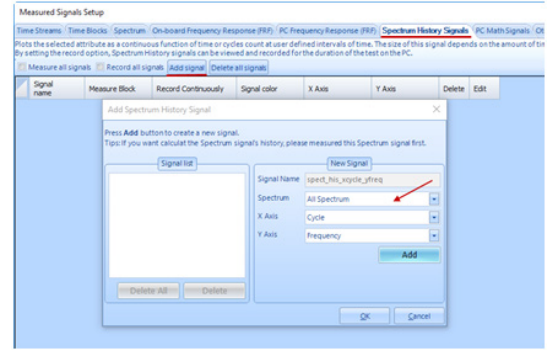


While exporting a recording file, the choice of channels that need to be exported along with an option to select a part of the signal to be exported is introduced.

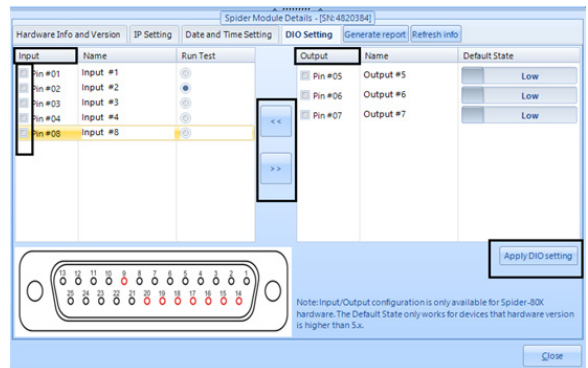
The user can now select the start time, end time, and the channels before exporting the data to .atfx or .txt.

EDM Vibration Control Software

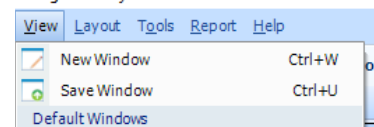
- Improved speed of signal display operations, such as 'Add all signals', 'Remove all signals'.
- Duplicated signals are marked in red in measured signals
- When adding Spectrum History Signals, provides an option to add the same type of signals for all channels



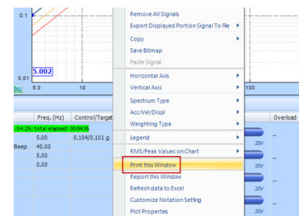
- Simulation mode, test running continuously until user stops
- Improved vertical and horizontal display range after changing spectrum type
- Open report in WPS office after it is generated, if Microsoft Office is not installed
- Provide warning message before importing a shaker library with a unit not matching EDM settings
- Spider-80SG, DIO channels can be switched between digital input and digital output



- Bug fixes to the "Save Window" function



- Directly print the report of the active signal window in right-click menu

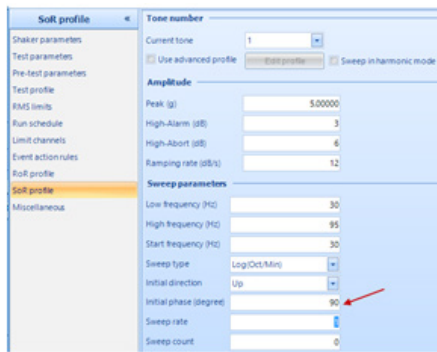


- Improve how EDM handles different format of decimal points in different countries

Random

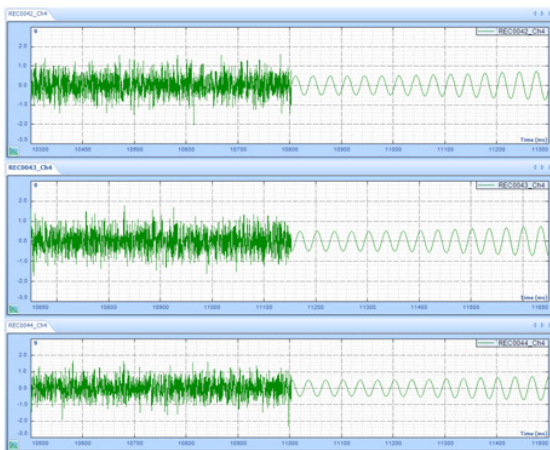
- Implement “Initial phase (degree)” for SoR sine tone

Set-up of the initial phase of a sine tone



Results of different initial phase of a sine tone:

In the following picture, Ch 4 is the control channel. When the Sine tone is turned on, the broadband is turned off at the same time so that the initial phase can be shown clearly. Signals in the following screenshot have initial phase of 0, 270, and 90 degrees of the same sine tone.



- Envelope signals are turned on/off with sine tones and narrowbands.

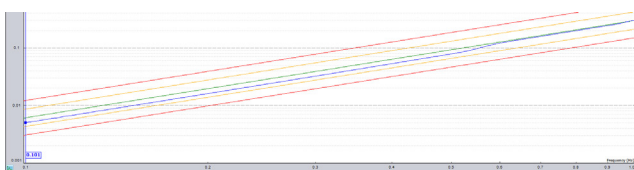
Each envelope(f) signal contains target peak values of a sine tone or narrowband across the sweeping range. Envelope signals are turned on/off with sine tones and narrowbands.

Sine/RSTD

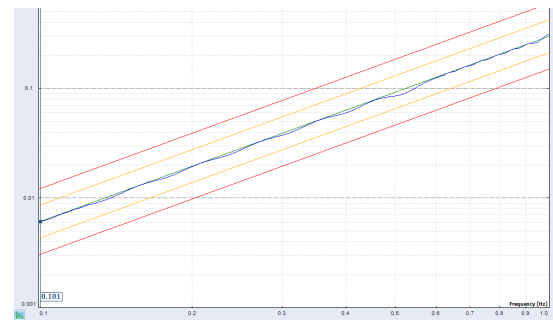
- Improved accuracy to low frequency control

At low frequencies:

Older Versions:

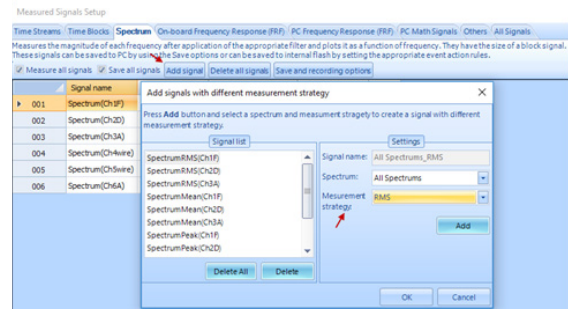


Improvements:

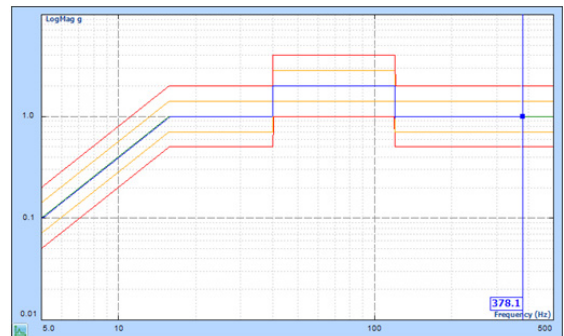


- Sine reduction test also needs measurement strategy signals

In previous release, different measurement strategies may be applied to one channel at the same time in swept sine tests. In 6.1, this feature is added to sine reduction.



- Allow vertical lines in Sine/Random profile and improve the performance



- Improve control performance to ramp up at 1Hz with very sensitive sensors (small sensitivities)

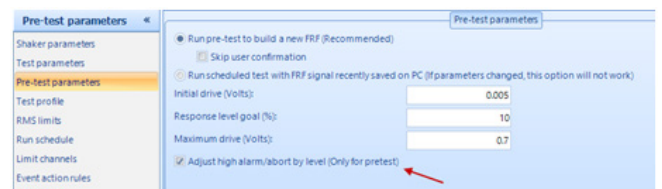
Shock/TTH/SRS

- Adjust high alarm/abort by level (Only for pre-test)

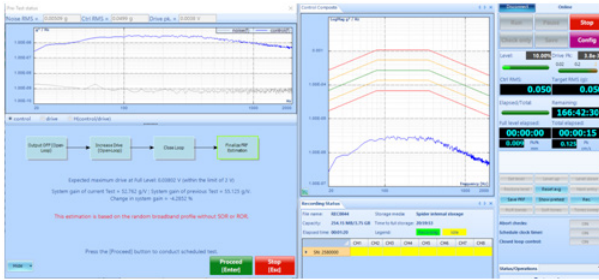
In previous releases, the option to adjust high alarm/abort by level in normal test is already available.

In this release, the option is added to pretest.

Here is where to setup:

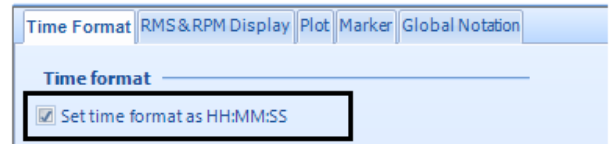


Alarm and abort limits are not adjusted by level in pretest.



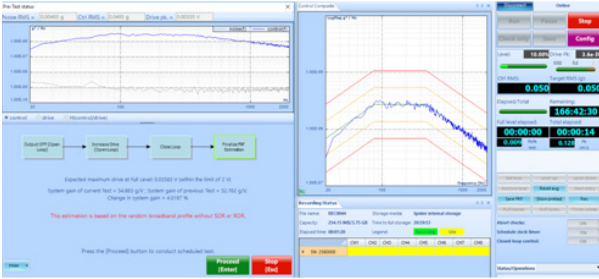
Post Analyzer

- Time format of HH:MM:SS has been added to PA

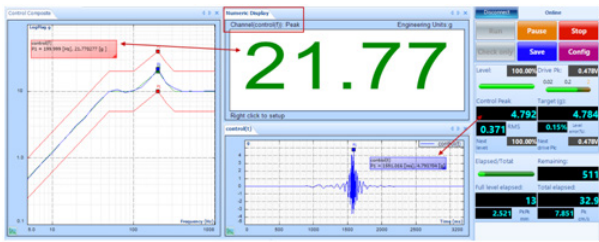


- Post Analyzer: Review GPS Tracks (data from CoCo-80X) without pressing 'Run'

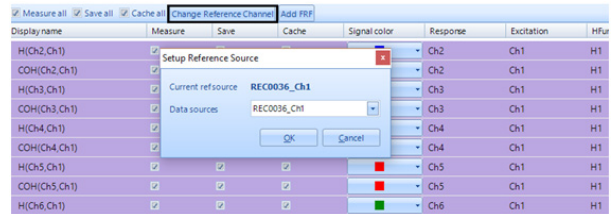
Alarm and abort limits are adjusted by level in pretest.



- Display peak value of SRS control spectrum

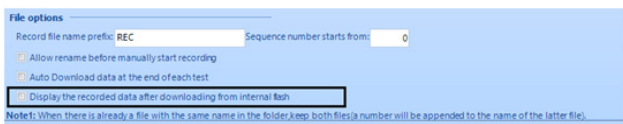


- Reference channel for all FRF signals can now be changed with one button click.



EDM Dynamic Signal Analysis

- An option to "Display the recorded data after downloading from internal flash" has been added.



This option would automatically display the recording data after downloading it.

- Improved speed of signal display operations, such as 'Add all signals', 'Remove all signals'.



Bug Fixes and Performance Enhancements

- Spectrum signal display should keep the (Y-Axis) zoom range after spectrum type changed

Discontinued Support to Products

Starting from the EDM 6.1 release, the following products are not supported by EDM.

- CoCo-80 (4 and 8 channels)
- Spider-81 (HW v5.x and earlier)
- Spider-81B (HW v3.x and earlier)
- Spider-81C (all HW versions)
- Installation of Bearing Library
- MySQL

SOFTWARE RELEASE HISTORY

Dates of software releases:

Type	Release	Exact Version	Release Date
Release	EDM 3.1	CI 3.1.3.2	11/28/2011
Release	EDM 3.2	CI 3.2.2.5	7/31/2012
Release	EDM 4.0	CI 4.0.2.7	11/11/2012
Release	EDM 4.1	CI 4.1.0.1	4/16/2013
Patch	EDM 4.1.5	CI 4.1.5.5	10/10/2013
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	2/07/2017

VERSION COMPATIBILITY

Product and Software Version	Firmware Versions
CoCo-80	
EDM 6.0.2.x	6.0.2.x
CoCo-80X	
EDM 6.1.0.x	6.1.0.x
Spider-80X/80Xi	
EDM 6.1.0.x	6.1.0.x
Spider-81 (v7.x)	
EDM 6.1.0.x	6.1.0.x
Spider-81B (v7.x)	
EDM 6.1.0.x	6.1.0.x
Spider-80SG	
EDM 6.1.0.x	6.1.0.x
Spider-20/20E	
EDM 6.1.0.x	6.1.0.x

SYSTEM REQUIREMENTS

Minimum System Requirements:

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

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

- Operating System: Windows 10, 64-bit
- Processor: Intel Core i7, 2.0 GHz or Higher
- RAM: 8G DDR3 1600 or higher
- PC storage: SSD