



## EDM 8.1

### Engineering Data Management Software Release Notes

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SPIDER EXPERIMENTAL MODAL ANALYSIS (EMA)



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**RELEASE HIGHLIGHTS**  
**Introducing the CoCo-70X**

The CoCo-70X is Crystal Instruments' latest handheld vibration analyzer, featuring an improved user interface and redesigned chassis. The CoCo-70X is a four-channel vibration analyzer with an IP-67 rating, designed specifically for the machinery Predictive Maintenance (PdM) community. The CoCo-70X offers powerful processing capabilities and an intuitive user-interface, providing users with an easy-to-use data collection experience. The newly designed chassis is lighter and more ruggedized, making the CoCo-70X a perfect device for route-based measurements.



**IP67 Water Resistant**

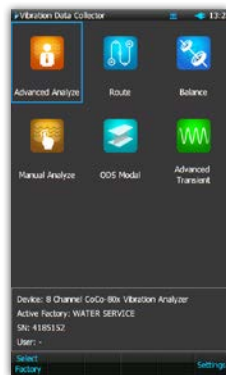
The CoCo-70X is designed with the consideration of occasional harsh environments in mind, including dusty and humid sites for data collection. The CoCo-70X has thus been designed to resist dust and immersion in water for up to 1 m, making it safe and reliable for accurate data collection in most environments.

**Light Weight and Ruggedized**

The CoCo-70X is designed to live up to its reputation as one of the most ideal handheld analyzers offered today. Its light weight design enhances the portability of the analyzer and the ruggedized case protects the analyzer from accidental drops or hits to ensure a smooth data collection experience.

**Redesigned UI on CoCo-70X**

The user-interface has been redesigned to offer a smoother experience for route based data collection and machine diagnosis applications. All software functions have been moved into a single unified interface on the home screen.



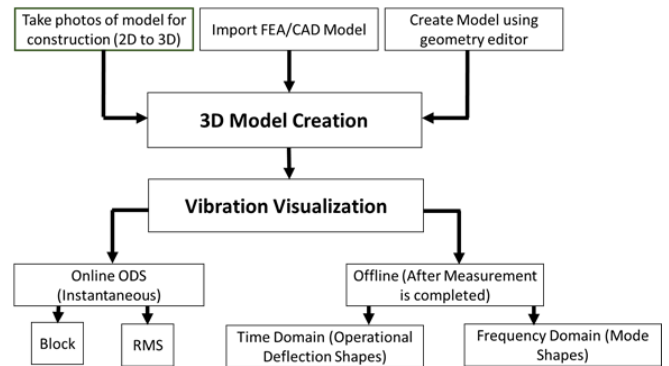
**Advanced Functions**

Even though the CoCo-70X is significantly more portable and lighter in weight than its similar counterparts, there was no compromise in design regarding its processing power. The CoCo-70X is built using the same powerful processor as the CoCo-80X and has the capability to perform all the advanced functions in addition to route based collection, which includes: Advanced Analyze, Balance, Manual Analyze, ODS Modal, Advanced Transient, Order Tracking.

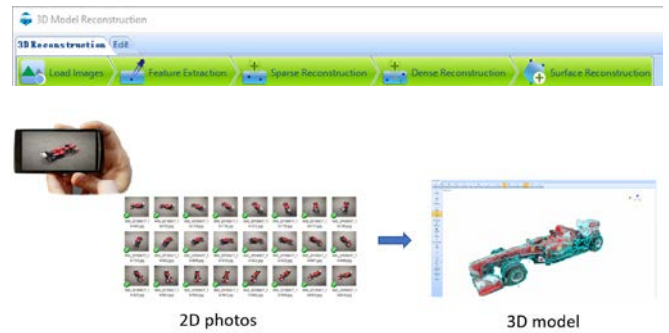
**Support with Vibration Diagnostics Software (VDS)**

The CoCo-70X is supported by Crystal Instruments' powerful diagnostics software, Vibration Diagnostics Software (VDS) including all the advanced diagnostic capabilities.

**Vibration Visualization: Introducing 3D model reconstruction from 2D images from a Camera**

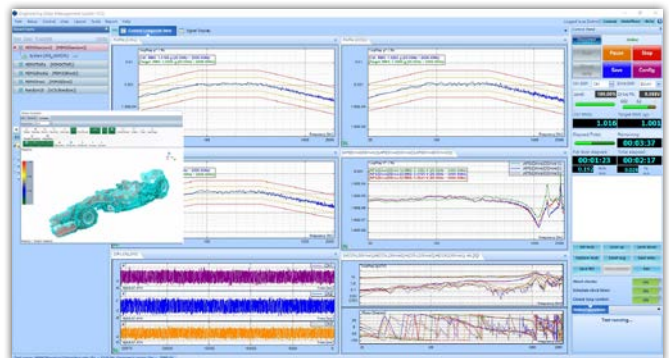


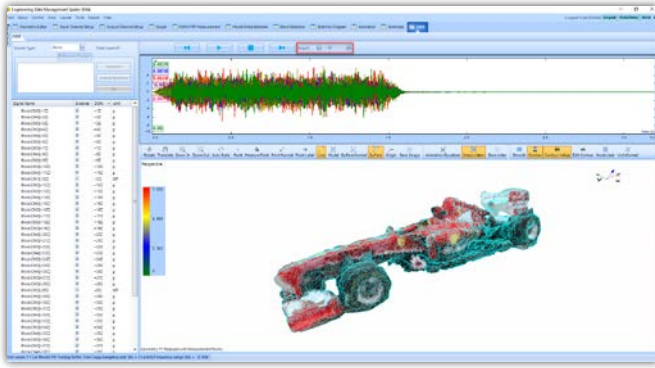
Building a 3D model of any structure is vastly simplified with the introduction of this feature. Any camera, including a cellular phone camera, can be used to capture images of an object from various angles to produce a 3D model of the structure.



This feature utilizes the advanced technology of 2D to 3D reconstruction to provide a simple solution for the challenges of creating 3D geometric models from convoluted test structures. The imported images are matched to extract the features and a 3D model of the structure is constructed after the point and surface reconstruction processes are completed. This approach not only saves time and effort for the user, it also provides an accurate model with great simplicity.

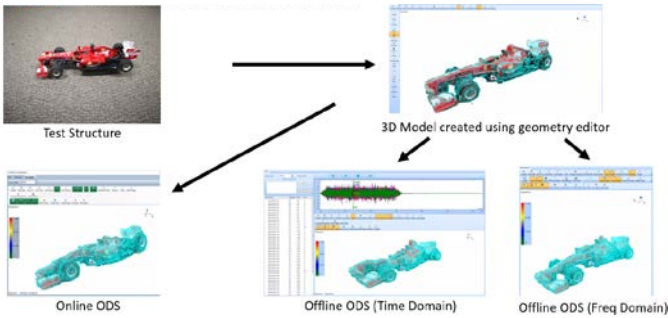
The reconstructed model can be exported and used along with Crystal Instruments' Modal Analysis software, Vibration Control software or Dynamic Signal Analysis software.





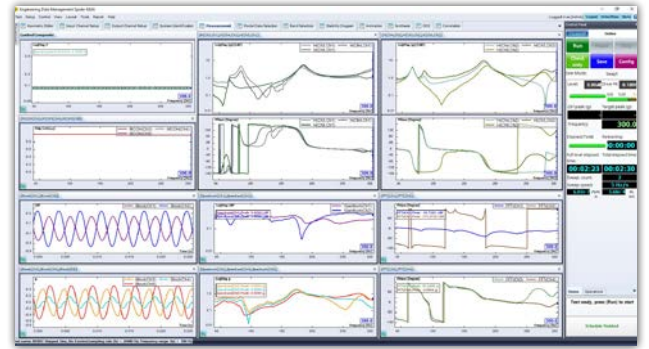
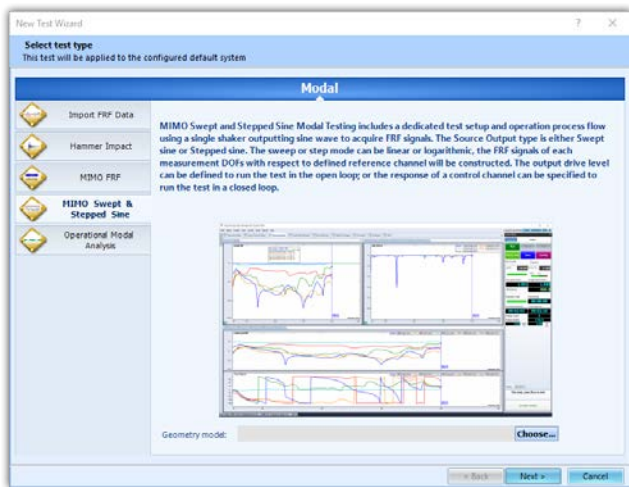
When used in combination with the vibration visualization feature of EDM software, animations representing a test object vibration on a shaker can be visualized.

Vibration visualization is not only useful in real time (Online ODS) where a user can see the instantaneous deformation of the structure, but is also helpful after the completion of measurements (Offline ODS). The measured data can be analyzed and visualized to observe the test structure's vibration in both the time and frequency domain.



### Introducing MIMO Swept Sine Testing in EDM Modal

EDM Modal MIMO Swept Sine Testing includes a dedicated test setup and operation process flow using multiple modal shakers outputting sine waves to acquire FRF signals. The source output type is swept sine. Linear and logarithmic sweep modes are supported for the Swept Sine test. The FRF signals of each measurement DOFs with respect to the defined reference channels will be constructed. The output drive levels can be defined to run the test in the open loop, or the response of the control channels can be specified to run the test in a closed loop.



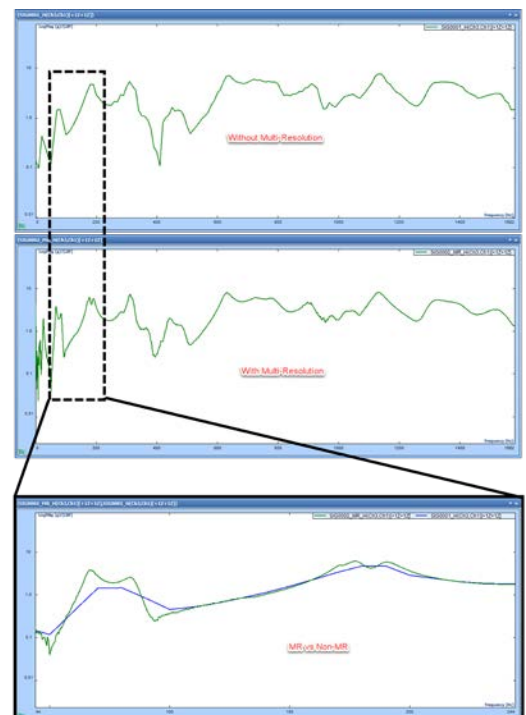
The modal analysis process is seamlessly integrated with MIMO Swept Sine testing.

Features:

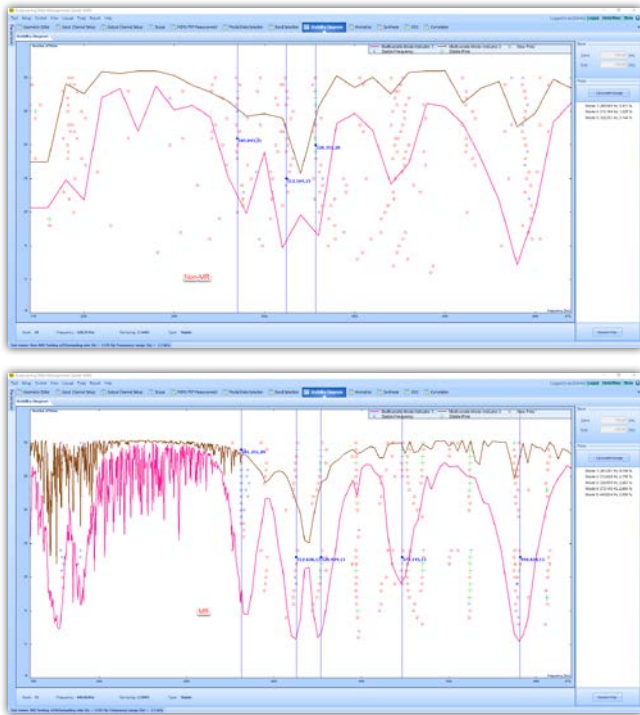
- Multiple sine excitations
- Multiple number of sweeps
- Different initial phase conditions for each sweep, +/- or random
- Specify source output level; or control the amplitude of multiple input channels
- Linear, Logarithmic sweep mode
- Filter, RMS, Mean or Peak for measurement strategy
- Fixed or proportional tracking filter, with user defined bandwidth
- User defined Start/end frequency; sweep speed

### Patented Multi-Resolution Spectrum Technology is Extended to the MIMO FRF Testing Suite of EDM-Modal

Crystal Instruments' has been successful in patenting the proprietary technology of multi resolution spectral analysis. The latest release of the EDM Modal software features Multi-Resolution spectrum technology implemented into the MIMO FRF testing suite. Multiple passes of FFT yield a much finer resolution in the lower frequency region. This provides the advantage of a better estimation of the quality factor (or damping) and the amplitude of the frequency response functions at the resonant frequencies.



The zoomed in comparison of the overlapped FRFs shows that with the multi-resolution spectrum the peaks are much sharper and better identified as compared to it being flat without the enabled multi-resolution spectrum. The richer information is available because the finer resolution captures more peaks that are not as clearly visible and spread out in the normal spectrum.

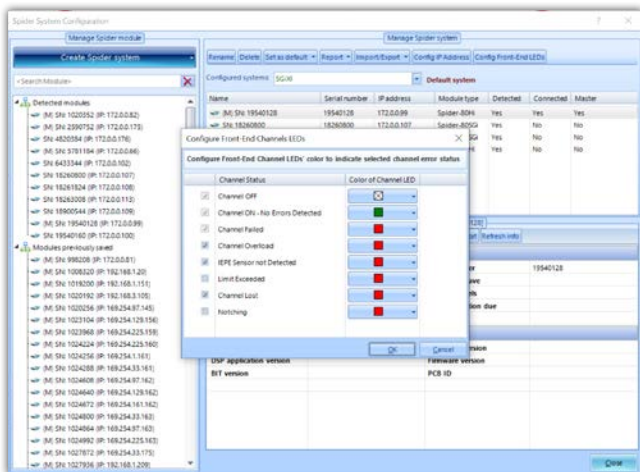


The stability diagrams above shows that the poles (frequency and damping) recognized with Multi-Resolution spectrum are more accurate because of finer frequency resolution.

**Configurable Error Status on Front-end LEDs**

The Spider-80Xi platform of devices (i.e. Spider-80Xi, Spider-80SGi and Spider-80Ti) have built in LEDs for each channel.

With the 8.1 version, users can customize LED indicators to display specific error messages in addition to the error messages displayed on the EDM screen. When used along with the powerful Black Box mode of Spider systems, any anticipated error message can be identified even without a connected PC to the monitoring Spider system.



When Spiders are deployed in a high channel count system,

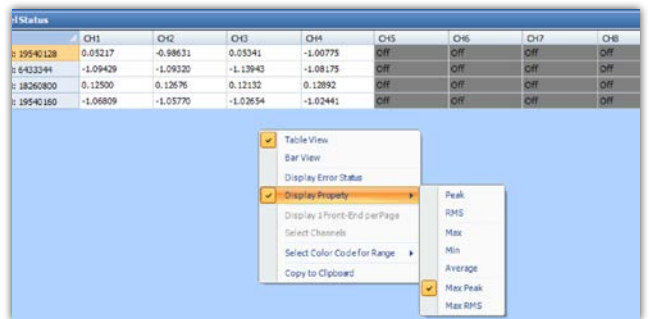
channels with issues can be identified with ease. A range of error messages that could be optionally displayed using the LED indicators, including Channel Lost, Limit Exceeded, Notching, Overload, IEPE sensor failures, are available. These configurations are available on all EDM modules including EDM-VCS and EDM-DISA.

**Revamped Channel Status View**

The Channel Status view received a major upgrade in the 8.1 release.

| Channel ID   | Ch1 | Ch2                     | Ch3            | Ch4                | Ch5 | Ch6 | Ch7 | Ch8 |
|--------------|-----|-------------------------|----------------|--------------------|-----|-----|-----|-----|
| SN: 19540128 | OK  | OK                      | Notching Limit | OK                 | OFF | OFF | OFF | OFF |
| SN: 6433344  | OK  | SPR Sensor Not Detected | OK             | OK                 | OFF | OFF | OFF | OFF |
| SN: 18260800 | OK  | OK                      | OK             | Monitor Chnl. Lost | OFF | OFF | OFF | OFF |

Error status messages including “Monitor Channels Lost”, “Limit Exceeded” and “Notching” are now easily identified.



With the capability of Spider front-ends to combine up to a 1024 channel count system, this feature makes it easier to view the error message on channels.

Combined with the configurable error status on the LED screens, the detection and correction of specific errors which result due to incorrect connections, bad cables or bad connectors can easily be identified and addressed.

In addition to the introduction of a user-friendly error status display, several convenient options to determine the channel statistics have also been introduced.

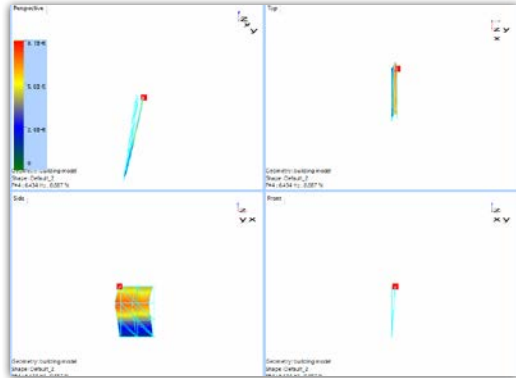
Max. Peak and Max. RMS, for example, would keep track of the maximum Peak and RMS values for the entire test duration. These values greatly help in determining if any channel was overloaded during any point during the test. When reported, the error status messages or overload issues that were overlooked during a test are easily identified.

**NEW FEATURES**

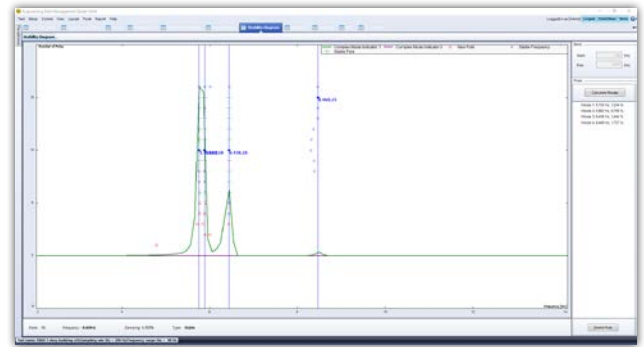
**New Features in EDM Modal**

**Operational Modal Analysis Enhancements**

The new release version of EDM 8.1 includes the implementation of numerous enhancements to the Operational Modal Analysis (OMA) testing suite. Scaling, multiple references, and the Stochastic Subspace Identification (SSI) curve-fitting method are some of the main features recently added to the OMA module.



The scaling feature which uses the response data of the reference point has been added. Multiple references can now be executed with this OMA test module. Finally, a new modal parameter estimation method called the Stochastic Subspace Identification (SSI) is added. This dedicated curve fitting method for OMA is not only cleaner but more efficient as well.



**New General Features**

**Synchronize Spiders to Time on a Server on the Internet or a Local LAN**

EDM 8.1 provides users with the ability to synchronize the time of Spider systems with a server time located on the internet or a local LAN.

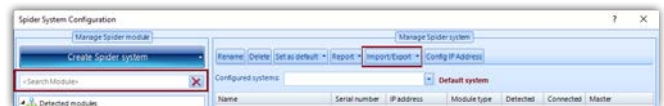


This enables the Spiders to operate independently of the time on the connected PC and provides the capability to always use the most authentic time.

Spiders running on PCs with incorrect times can introduce incorrect time stamps on the raw time recordings and signals that are saved to internal storage. Using a server time not only enables a smooth transition to run the Spider systems using different PCs, but it also ensures the accuracy of time stamps.

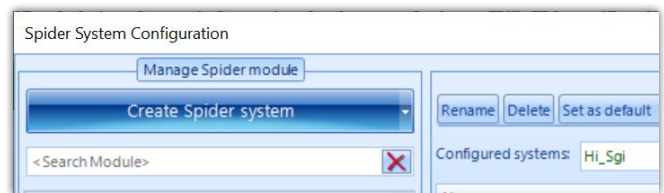
**Ability to Import / Export Spider Configurations**

Spider configurations can now be moved around different PCs or across different EDM modules.

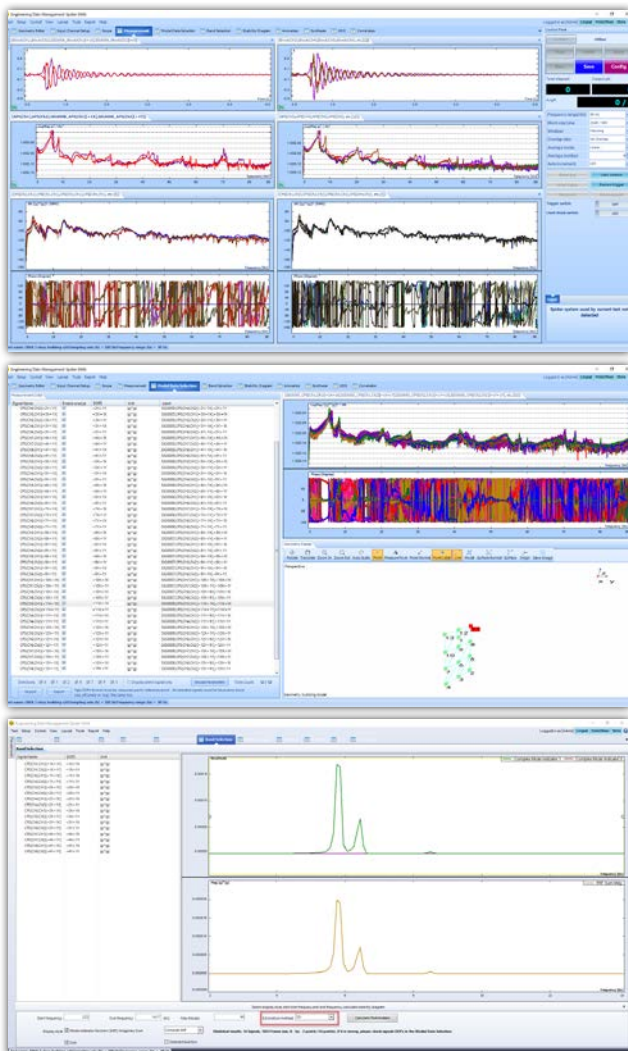


The effort required to build Spider systems in each PC is now reduced. The Spider systems can be exported or imported without the need to export or import the whole database.

In addition, an option to search through available Spider systems is also introduced. Users can configure high channel count systems into multiple Spider systems by using different channels in each system. Searching through and modifying Spider systems is much simpler now through the implementation of this new search feature.



A re-arranged layout also simplifies the configuration and enhances usability by hiding the options not frequently used in the Spider system.



**Directly Open Test Files from Windows Using the Desired Software Module**

Users can select a specific EDM module when opening an .stk file.



**Copy/Paste Window Display Settings**

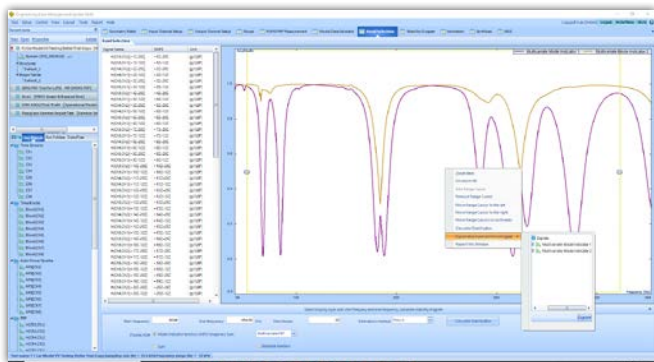
A convenient option to copy and use display settings from one window to a new window is introduced in the EDM 8.1 release. Options to copy or paste are available from the right-click menu of a display window, under Display Settings.



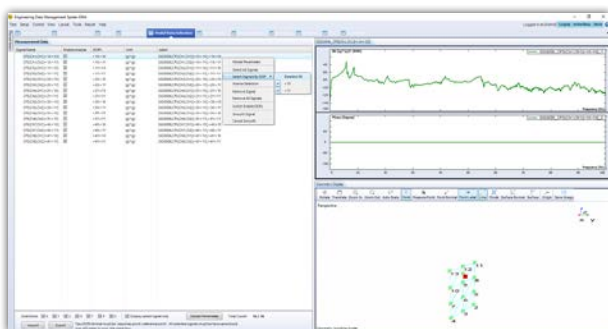
**MAJOR IMPROVEMENTS**

**EDM Modal**

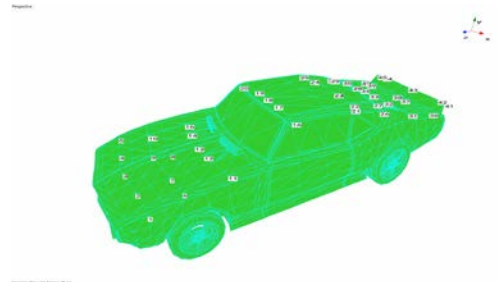
**Band Selection: Added Export Displayed Signals Feature**



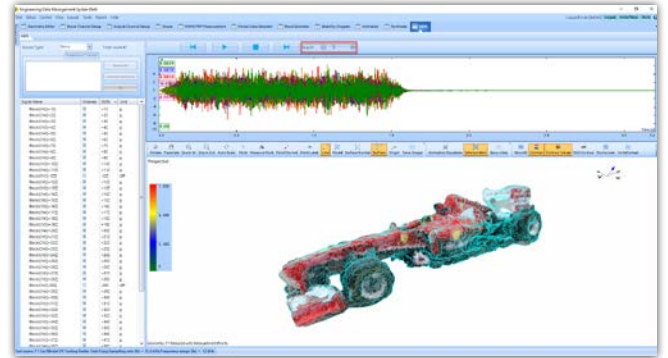
**Modal Data Selection: Multiple-Reference Checkmark Box**



**Geometry: Enhancements to Point Labels**



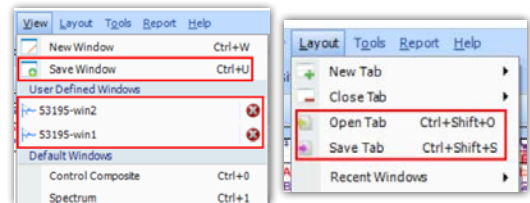
**ODS: Skip Data Points in Time Block ODS**



**General Improvements**

**“Save Tab” and “Save Window as User-defined” Preserve Display Settings.**

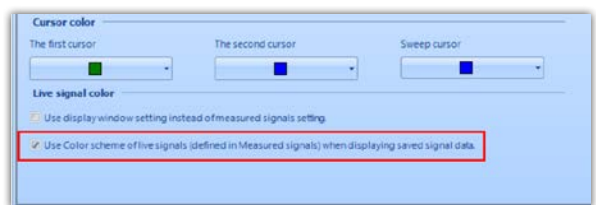
Opening a tab or opening a user-defined window will restore the display settings and signal display.



Available in all EDM modules, this feature can be enabled or disabled depending on the type of signal data that needs to be compared.

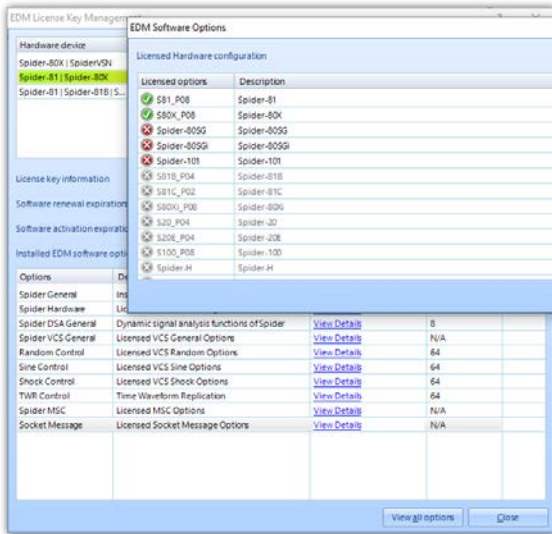
**Users Can Extend Color Scheme of Live Signals to Saved Signals**

At times, comparing the data from channels over multiple runs is necessary. However, for most other times, the comparison between different channels for various runs finds more use. To help the latter scenario, an option to extend the color scheme of live signals has been extended to the saved signals.

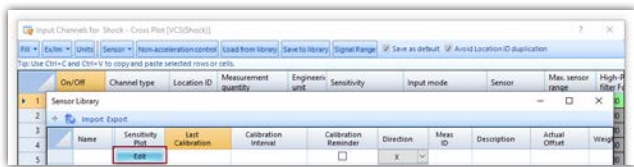


Available in all EDM modules, this feature can be enabled or disabled depending on the type of signal data that needs to be compared.

### Color Icons in License Key Manager



### Sensitivity Plot Added as Property of Sensor Library



### Bug Fixes and Performance Enhancements

- Add signal names in the error message for duplicated FRF signals in Measured Signals Setup
- “Next Entry” action can be triggered by DIO

## 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   |

## 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              |                   |
| EDM Testing 8.1.0.x          | 8.1.0.x           |
| Spider-81 (v7.x)             |                   |
| EDM Testing 8.1.0.x          | 8.1.0.x           |
| Spider-81B (v7.x)            |                   |
| EDM Testing 8.1.0.x          | 8.1.0.x           |
| Spider-80SG/SGi              |                   |
| EDM Testing 8.1.0.x          | 8.1.0.x           |
| Spider-20/20E                |                   |
| EDM Testing 8.1.0.x          | 8.1.0.x           |

| Product and Software Version           | Firmware Versions |
|--|-------------------|
| CoCo-80                                |                   |
| EDM 6.0.2.x                            | 4.0.x             |
| CoCo-80X/90X                           |                   |
| EDM Testing 8.1.0.x (EDM CoCo for DSA) | 1.6.x             |