CRYSTAL
INSTRUMENTS

EDM 7.2 (EMA)
EDM - Experimental Modal Analysis Software Release Notes
ENGINEERING DATA MANAGEMENT SOFTWARE - EXPERIMENTAL MODAL ANALYSIS
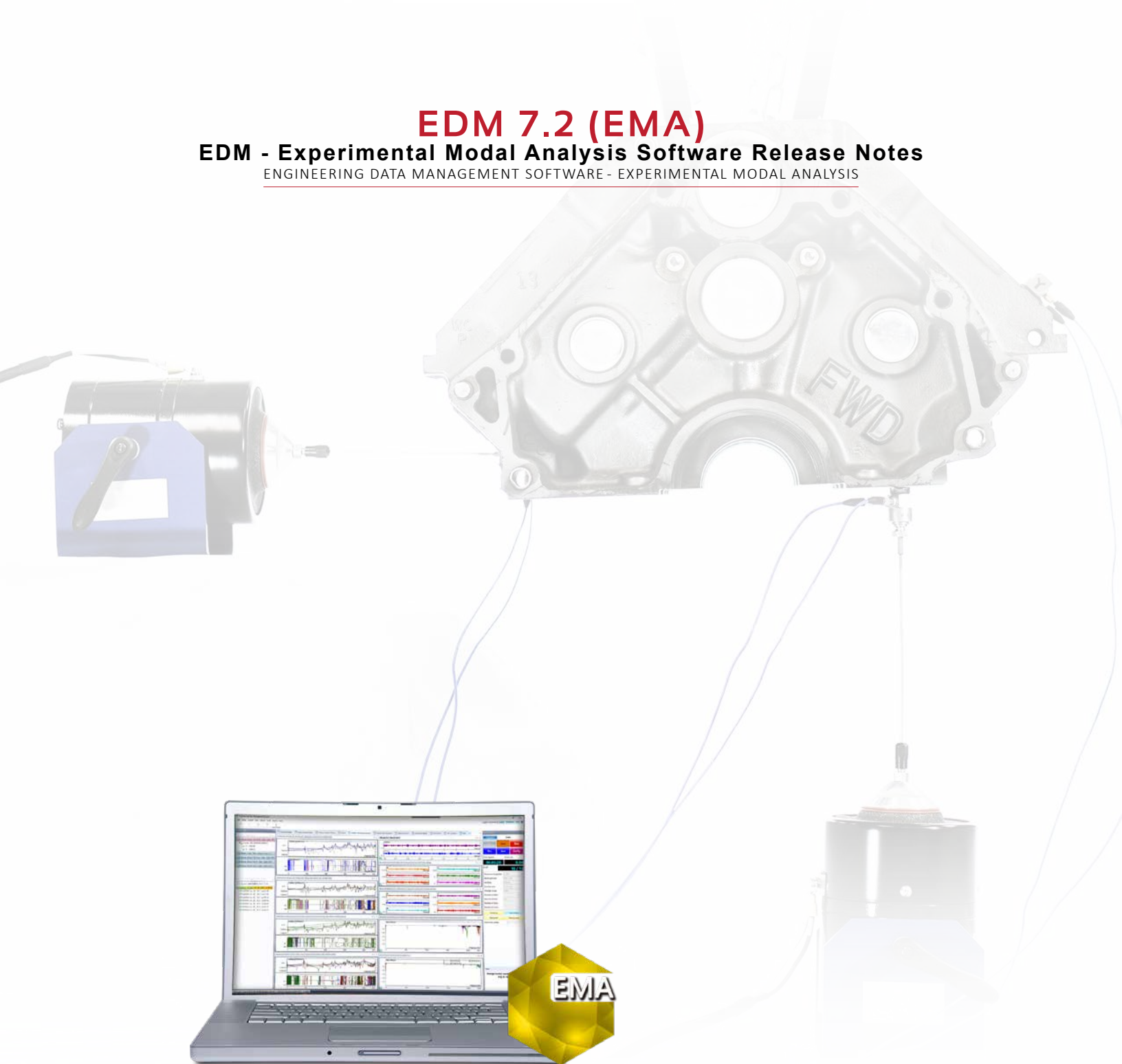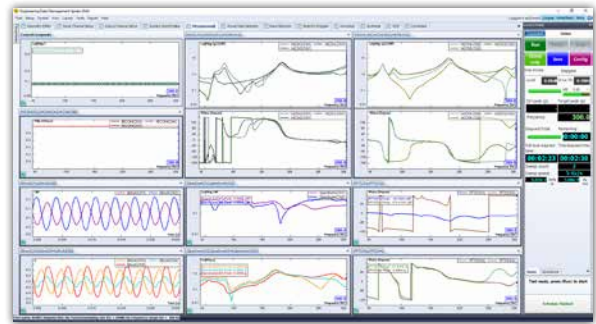
EMA

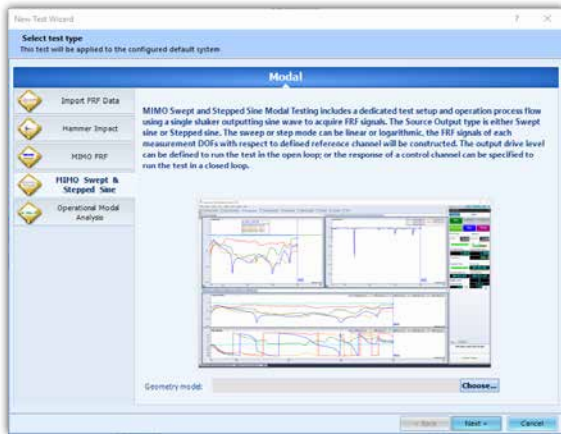# TABLE OF CONTENTS

RELEASE HIGHLIGHTS

Introducing EDM Modal MIMO Stepped Sine and Poly-X curve-fitting method for Experimental Modal Analysis (EMA)

In EDM 7.2, a new modal testing type called Multiple Input Multiple Output (MIMO) Stepped Sine has been implemented which allows the users to control and monitor multiple channels according to the implemented control strategy. This is a whole new module where multiple modal shakers can be used to provide multiple stepped sinusoidal excitations to the structure under test. Using a large channel count data acquisition system like the Spider, this sine shaker excitation method provides higher efficiency and accuracy for the FRF measurements while minimizing local stresses on the test article. The MIMO Stepped Sine also provides a high signal-to-noise ratio of sine excitations because it runs one frequency at a time.

The new release version of EDM 7.2 also has a new modal parameter estimation method called Poly-X which is Poly-reference Least Square Complex Frequency Domain (p-LSCF). This is a frequency domain-based curve-fitting method that is used to extract the modal parameters of the structure under test more efficiently. The Poly-X makes it easier for the users to select the stable poles to obtain the natural frequencies and damping of the test structure, based on a much neater Stability Diagram compared to that from the time domain method.
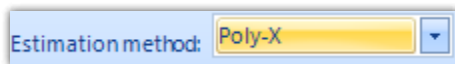
NEW FEATURES

New Features in Experimental Modal Analysis
MIMO Stepped Sine Testing

EDM Modal MIMO Stepped 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 currently available is stepped sine. Linear and Logarithmic sweep modes are supported for the Stepped 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 the MIMO Stepped 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; Number of points; Delta F (or Points/Oct); Transition speed

Poly-X Modal Parameter Estimation Method

Poly-X is a frequency domain modal parameter estimation method. This curve-fitting approach is faster and cleaner than the previous methods used to estimate the modal characteristics of the test structure. The figure below shows that, using the same frequency band and the same number of modes, Poly-X curve fitter provides a cleaner stability diagram which has much lesser computational modes. This makes it easier for the user to pick the stable poles to extract the natural frequencies, damping, and ultimately the mode shapes later of the structure under test.
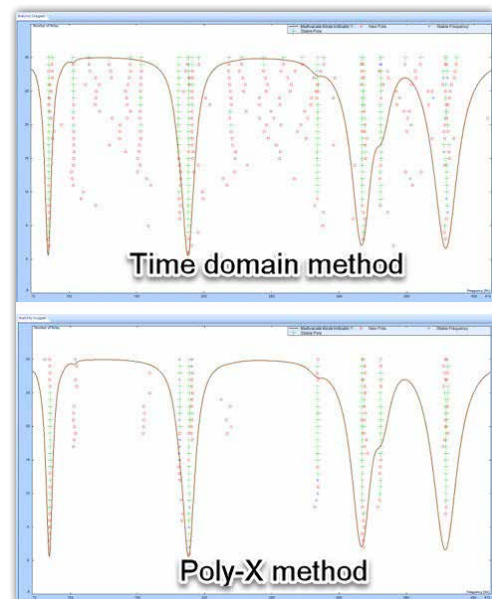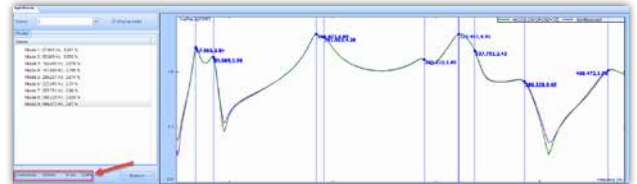

Features:
- Frequency domain-based estimation method
- Can be used for multiple reference FRF data set
- Faster and more efficient curve-fitting method

- Cleaner stability diagram
- Lesser computational modes
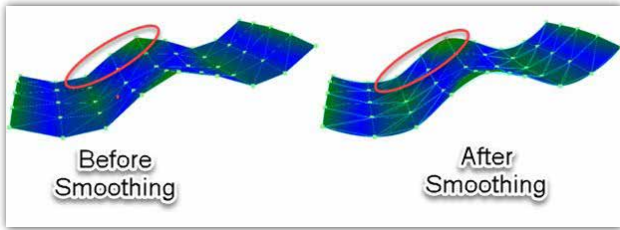- Easier to pick stable poles

MAJOR IMPROVEMENTS
Experimental Modal Analysis
Animation: Added curve smoothing feature

Animation: Added node lines feature

Animation: Enhanced edit contour feature

Band Selection: Added selected function of FRF feature

Synthesis: Added correlation and error percent to FRF synthesis

Input Channel: Enhancement of TEDS to read DOF details of the sensor (component name, point ID and direction)

SOFTWARE RELEASE HISTORY

Dates of Software Releases

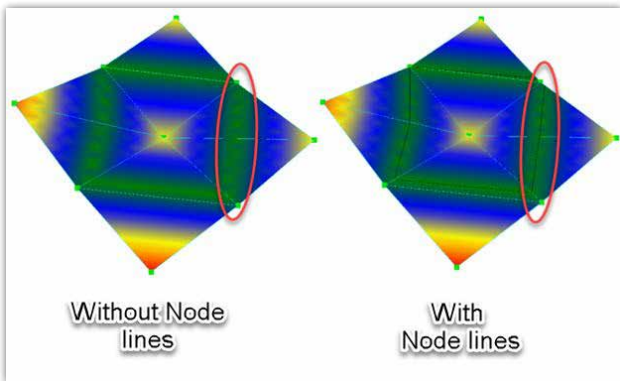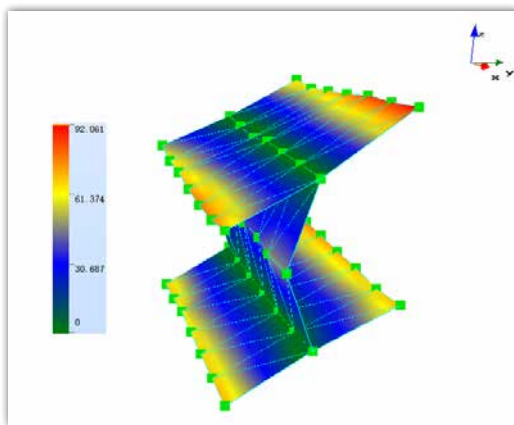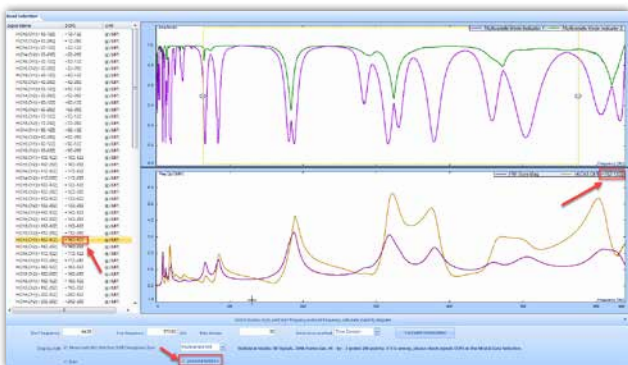| Type	Release	Exact Version	Release Date
Release	EDM 3.1	CI 3.1.3.2	11/28/2011
Release	EDM 3.2	CI 3.2.2.5	7/31/2012
Release	EDM 4.0	CI 4.0.2.7	11/11/2012
Release	EDM 4.1	CI 4.1.0.1	4/16/2013
Patch	EDM 4.1.5	CI 4.1.5.5	10/10/2013
Release	EDM 4.2	CI 4.2.0.3	2/28/2014
Patch	EDM 4.2.0	CI 4.2.0.14	7/2/2014
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	2/7/2017
Patch	EDM 6.1	CI 6.1.0.27	8/22/2017
Release	EDM 7.0	CI 7.0.0.6	2/1/2018
Release	EDM 7.1	CI 7.1.0.7	7/18/2018
Patch	EDM 7.1	CI 7.1.0.13	9/12/2017

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):

- Operating System: Windows 10, 64-bit
- Processor: Intel Core i7, 2.0 GHz or Higher
- RAM: 8GB DDR3 1600 or higher
- Available storage space: 10 GB

VERSION COMPATIBILITY

Product and Software Version	Firmware Versions
Spider-80X/80Xi	
EDM Testing 7.0.0.x	7.0.0.x
Spider-81 (v7.x)	
EDM Testing 7.0.0.x	7.0.0.x
Spider-81B (v7.x)	
EDM Testing 7.0.0.x	7.0.0.x
Spider-80SG	
EDM Testing 7.0.0.x	7.0.0.x
Spider-20/20E	
EDM Testing 7.0.0.x	7.0.0.x

Product and Software Version	Firmware Versions
CoCo-80	
EDM 6.0.2.x	4.0.21
CoCo-80X	
EDM Testing 7.0.0.x (EDM CoCo for DSA)	1.4.x