ME scope

Data Block (BLK) Window

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VIBRANT

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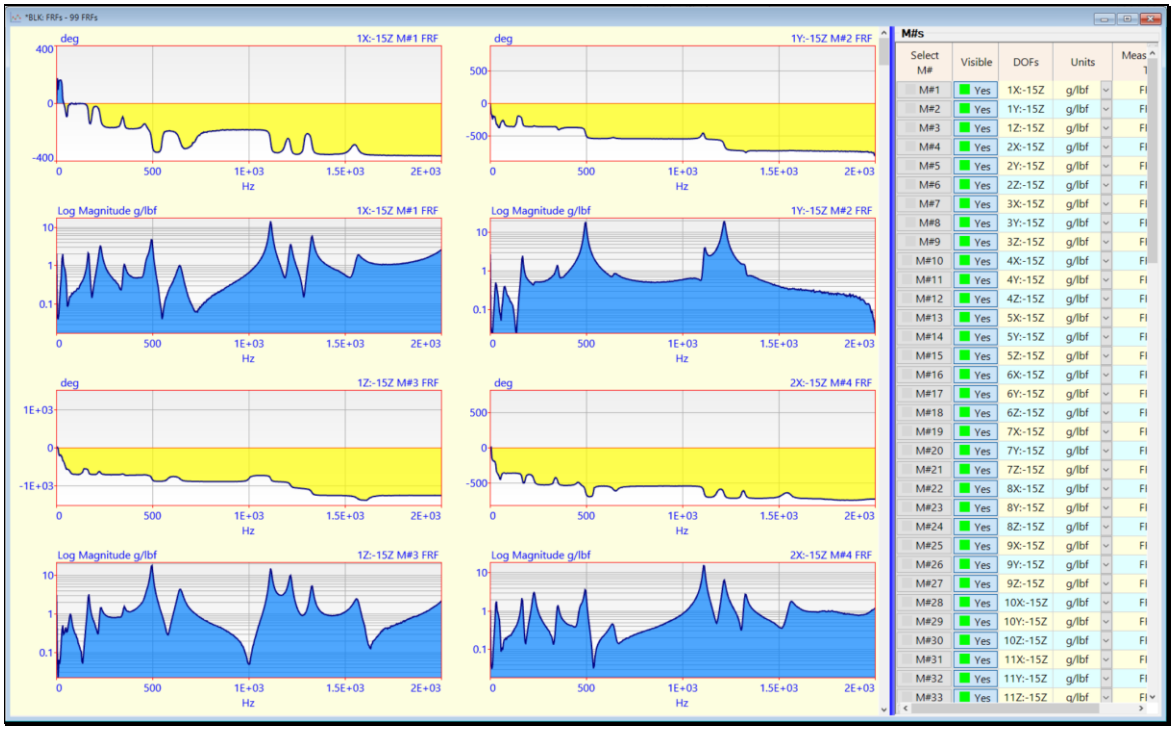
Data Block (BLK) Window



*Data Block (**BLK**) Window showing log magnitude of 4 **FRF**s.*

This chapter contains descriptions of the basic commands in the Data Block (**BLK**) window.

NOTE: Only the commands for a **VT-620 Visual ODS** package are documented in this chapter. Additional commands authorized by MEscope Options are documented in separate chapters. Execute **Help | License Manager** to verify the Options authorized by your MEscope license.

A Data Block (**BLK**) window is used for

- Displaying and performing operations on ***multiple* time waveforms** or **frequency domain functions**
- Displaying Operating Deflection Shape (**ODS**) data from the ***cursor position*** in the Data Block (**BLK**) on a 3D model in a ***connected*** Structure (**STR**) window
- ***Curve fitting* the M# data** to obtain the experimental modal parameters of a Structure

A Data Block (**BLK**) window contains ***one or more* M#s** of measurement data, ***all sharing a common* X-axis**.

Each Data Block (**BLK**) window can contain either sampled time waveforms or calculated frequency functions.

Graphics Area & M#s Spreadsheet

The Data Block (**BLK**) window contains **graphics *on the left*** and a **M#s** spreadsheet ***on the right***, separated by a **vertical blue splitter bar**.

Each **M#** is plotted in the graphics area ***on the left***

The properties of each **M#** are listed in a row of the **M#** spreadsheet ***on the right***

- Drag the **vertical blue splitter bar *horizontally*** in the window to make the graphics or the **M#s** spreadsheet larger

Menu Commands

Menu commands are ordered by command menu (from ***left to right***), and then by the commands in each menu (from ***top to bottom***). Each menu command is executed by choosing it from its command menu, or ***by clicking*** on its **Tool** on a Ribbon or if it is on a Toolbar.

Data Block (BLK) Mouse & Keyboard Operations

To ***enlarge*** this text, *click* on it, ***hold down* the Ctrl key** and ***spin the mouse wheel***.

Right Click Menus

- ***Right click*** on a **graphics area** to display a menu of ***frequently used*** window commands
- ***Right click*** on a spreadsheet to display a menu of ***frequently used*** spreadsheet commands

Re-Ordering Spreadsheet Columns

- ***Click*** & ***drag*** the **column header** to move a spreadsheet column to a new position

Spreadsheet Vertical Scrolling

- If a **vertical scroll bar** is displayed on the **right side** of a spreadsheet , **click** on the spreadsheet and **spin the mouse wheel to scroll the** spreadsheet **vertically**

Spreadsheet Text Size

- To change the text size in a spreadsheet , ***click*** on the spreadsheet , ***hold down* the Ctrl key**, and ***spin the mouse wheel***

Cut, Copy & Paste Text

1. ***Select*** one or more spreadsheet text cells
2. ***Hold down* the Ctrl** key and,
   - ***Press* the X key to cut** the selected text to the Windows Clipboard
   - ***Press* the C key to copy** the selected text to the Windows Clipboard
   - ***Press* the V key to paste** text from the Windows Clipboard into the selected cells

Scrolling the Graphics Display

- ***Click*** on the vertical scroll bar ***to the right*** of the graphics area and *spin the mouse wheel*

Zooming the Graphics Display

- ***Click*** in the graphics area and ***spin the mouse wheel***

Panning the Zoomed Graphics Display

- ***Right click & drag*** the mouse pointer in the graphics area
- Or use the horizontal scroll bar ***displayed below the graphics***

Moving the Cursors

Line Cursor

- Position the mouse pointer in the **graphics area** at the desired position and ***click***
- Position the mouse pointer in the **graphics area**, and ***click & drag*** it to the desired position

Peak or Band Cursor

- Position the mouse pointer ***inside the band***, and ***click & drag*** it to the desired position

Moving an Edge of the Peak or Band Cursor

- Position the mouse pointer ***close to an edge outside the band***, and ***click & drag*** to move the edge

Toggle M# Selection

A ***selected*** **M#** has a ***shaded background*** in the graphics area, and its **Select M#** button is changed from **No** to **Yes** in the **M#s** spreadsheet .

- ***Hold down*** **the Ctrl key** and *click* in the graphics area ***to toggle the selection*** **of an M#**

Selecting a Range of M#s

- ***Click*** on a **Select M#** button of the ***first*** **M#** in the **M#s** spreadsheet to be ***selected***
- ***Hold down*** **the Shift key**, and ***click*** on the **Select M#** button of the ***last*** **M#** of the range of **M#s** to be ***selected***

Graphics Scroll Bars

Under certain conditions, ***both vertical & horizontal scroll bars*** will be displayed on the ***right side and below the*** **graphics area** in a Data Block (**BLK**) window.

Vertical Scroll Bar

If the number of displayed **M#s** is ***less than the total number of*** **M#s** in the Data Block (**BLK**), a scroll bar is displayed on the ***right side*** of the graphics area.

- ***Click & drag*** the vertical scroll bar ***to scroll the display through the M#s***

Horizontal Scroll Bar

When the graphics display **is Zoomed,** not all measurement samples are displayed and a scroll bar is ***displayed below*** the graphics area.

- ***Click & drag*** the horizontal scroll bar to ***scroll through the measurement samples***
- Or ***right click & drag*** in the graphics area to ***scroll through the samples***

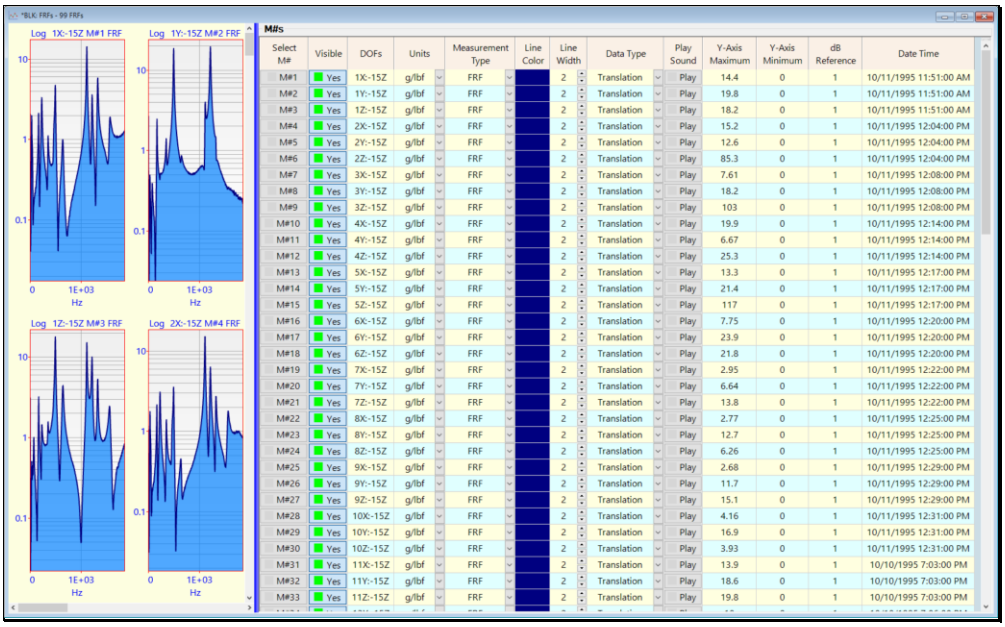
M#s Spreadsheet

The **M#s** spreadsheet contains all the properties associated with each measurement in a Data Block (**BLK**) window.

Each **row** of the **M#s** spreadsheet contains all properties of a single measurement

Each **column** of the **M#s** spreadsheet contains a ***single*** property for ***all*** measurements

- ***Drag*** the **Vertical Blue Splitter Bar** to the ***left*** to display the **M#s** spreadsheet
- Or execute Display | M#s SS
- Spreadsheet columns can be re-ordered by dragging & dropping them into a new position
- ***Selected*** spreadsheet **rows** can be moved by executing **Move Selected M#s Up** or **Down**
- If the **M#s** spreadsheet contains ***more*** **rows & columns** than are currently displayed, scroll bars will appear on the ***bottom*** and ***right side*** of the spreadsheet
- Some **columns** in the **M#s** spreadsheet are only made visible when **certain Options** are authorized in your software



*Data Block (**BLK**) Window Showing **M#s** spreadsheet .*

Showing & Hiding Spreadsheet Columns

- ***Right click*** on any spreadsheet and execute **Show Hide Columns** from the menu

The **File | Data Block Options** box will open displaying the **Show Hide** tab.

- ***Check*** columns ***to show*** them, and ***Un-check*** columns ***to hide*** them, and ***click*** on **OK**

Reset Spreadsheet Column Widths

- ***Right click*** on any spreadsheet and execute **Reset Column Widths** from the menu

Unique Measurement Numbers (M#s)

Each measurement in a Data Block (**BLK**) has a ***unique* M#**, listed in the **Select M#** column in the **M#s** spreadsheet.

M#s are used in the **M# Links** in a ***connected*** Structure **(STR)** window to retrieve measurement data for displaying **ODS**'s in animation.

Selecting M#s

A ***selected* M#** has a ***shaded background*** in the graphics area, and its **Select M#** button has a **green background** in the **M#s** spreadsheet.

Selecting M#s in the M#s Spreadsheet

- ***Right click*** on the **M#s** spreadsheet and execute one of the **Edit | Select M#s** commands from the menu
- Or ***click*** on the **Select M#s** button for an **M# *to select it***
- Or ***double click*** on the **Select M#**s column heading to ***select* or *un-select all* M#s**

Selecting M#s in the Graphics Area

- ***Hold down* the Ctrl key** and *click* in the graphics area ***to toggle selection* of an M#**
- Or ***right click*** on the graphics area and execute one of the **Edit | Select M#s** commands from the menu

Changing M# Properties

- ***Click*** on a property cell in the **M#s** spreadsheet , and edit the property of a single **M#**
- Or ***double click*** on the **column heading** of the property to be changed, ***choose or enter*** the property into the dialog box, and ***click*** on **OK**

Re-Ordering Spreadsheet Columns

- ***Click*** & ***drag*** **the column header** to move a column to a new position

Spreadsheet Vertical Scrolling

If a ***vertical*** **scroll bar** is displayed on the ***right side*** of a spreadsheet ,

- ***Click*** on the spreadsheet and ***spin the mouse wheel*** to ***scroll*** the spreadsheet vertically

Changing the M# Spreadsheet Text Size

- *Click* on the spreadsheet , *hold down* the Ctrl key, and *spin the mouse wheel*

Cut, Copy & Paste Text

1. ***Select*** one or more spreadsheet text cells
2. *Hold down* the Ctrl key and,
   - ***Press*** **the X key to cut** the selected text to the Clipboard
   - ***Press*** **the C key to copy** the selected text to the Clipboard
   - ***Press*** **the V key to paste** text from the Clipboard into the selected cells

Visible Column

Shows or Hides each **M#**.

Hidden **M#s** are excluded from all Data Block (**BLK**) operations.

Measurement Type Column

Contains the **Measurement Type** of each **M#**.

- ***Click*** on a cell in this column to display a list of available Measurement Types

DOFs Column

Contains the **DOFs** of each **M#**.

A measurement DOF is the location on the test article (Point **number** & **direction)** where a sensor was located when measurement data was acquired.

Each DOF is either a Roving DOF (***moving sensor***) or a Reference DOF (***fixed sensor***)

Single-Channel Measurement

Each ***single-channel*** measurement (Auto correlation, Auto spectrum) ***has a single*** **Roving DOF**.

- For example, if a sensor is located at **Point 1** and is sensing in the **X direction**, its DOF is **1X**

Cross-Channel Measurement

A ***cross-channel*** measurement (**FRF** or Cross spectrum), ***has both*** **Roving & Reference DOFs**, separated by a **colon (:)**

Roving Impact Test

If an **FRF** was measured by impacting at **DOF ➔ 1X** and a (***fixed***) accelerometer has **DOF ➔ 2Z**, then the **FRF** has **DOFs ➔ 1X : 2Z**

Shaker Test

If an **FRF** was measured with a shaker located at **DOF ➔ 1X** and a (***roving***) accelerometer has **DOF ➔ 2Z**, then the **FRF DOFs ➔ 2Z : 1X**

Using the DOF Generator

- ***Double click*** on the **DOFs** column header to open the DOF Generator for creating **DOFs**

See the **Using the DOF Generator** section in this chapter for details on using the DOF Generator.

Units Column

Contains the sensor engineering units of each **M#**.

Typical **input units** are excitation **force** units.

Typical **output units** are displacement, velocity, or acceleration units.

FRFs have both input & output units (**response output units / force input units**)

Transmissibility units are (**Roving response output units / Reference response input units**)

Cross spectrum units are (**response units * force units) or (response units)^2**

ODS-FRF units are (**Roving response units * Reference response units**)

Color Column

Contains the **line color** of each **M#**.

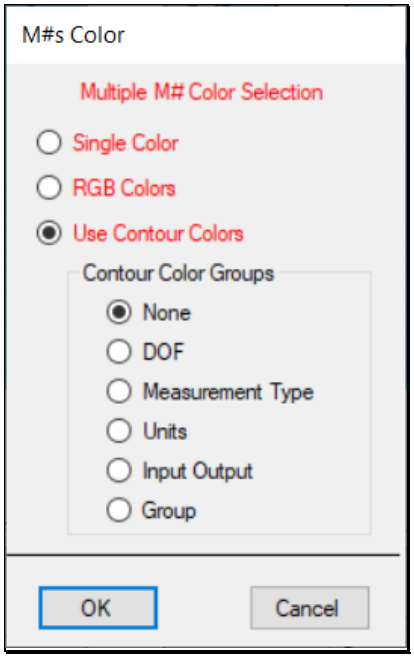
All measurements are displayed using their **M#** color, except in the **Contour Map** format.

To color all (or ***selected***) **M#s** using either a **Single Color** or the colors in the **Contour Colors** tab in the **File | Data Block Options** box,

- ***Double click*** on the **Color** column header.

The following dialog box will open.

- Select a color type and ***click*** on **OK**



Sound Column

Plays the sound of the **M#** through the sound system on your computer.

If the **Band Cursor** is displayed, then the samples in the cursor band are played through the sound system.

If the ***selected*** **M#** is a frequency domain **M#**, it is **Inverse FFT'd** before playing it through the sound system.

Label Column

Contains a ***text description*** of each **M#**.

Data Type Column

Contains the **Data Type** of each **M#**.

- ***Click*** **on a cell in this column** to display a list of available Data Type choices

Y-Axis Minimum, Y-Axis Maximum Columns

Contains the scaling method used to display each **M#**.

Auto Scale

Displays each **M#** with its maximum value ***near the top*** of the graphics display.

Relative Scale

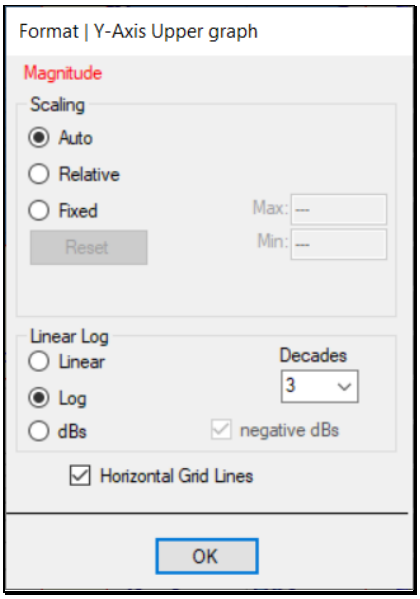
Displays each **M#** ***relative*** to the ***maximum value*** of all the **M#s** in the Data Block (**BLK**).

Fixed Scale

Displays each **M#** between user-specified **Minimum** & **Maximum** values.

Format | Y-Axis

Auto, **Relative** or **Fixed** scales can also be chosen for ***all*** (or ***selected***) **M#s** in the dialog box shown below.



Date Time Column

Contains a ***text date & time*** of the acquisition or calculation of each **M#**.

Group Column

Groups are used for scaling different types of shape data (such as vibration and acoustic data), so that both can be displayed together in animation.

- If no names are entered in this column, all **M#s** are treated as belonging to the ***single* Group**
- Contour colors can be defined for each Group
  - *See* the **Color Contours** tab under the **File | Data Block Options** command for details

Using the DOF Generator

The DOF Generator creates **DOFs** for ***all*** (or ***selected***) **M#s**.

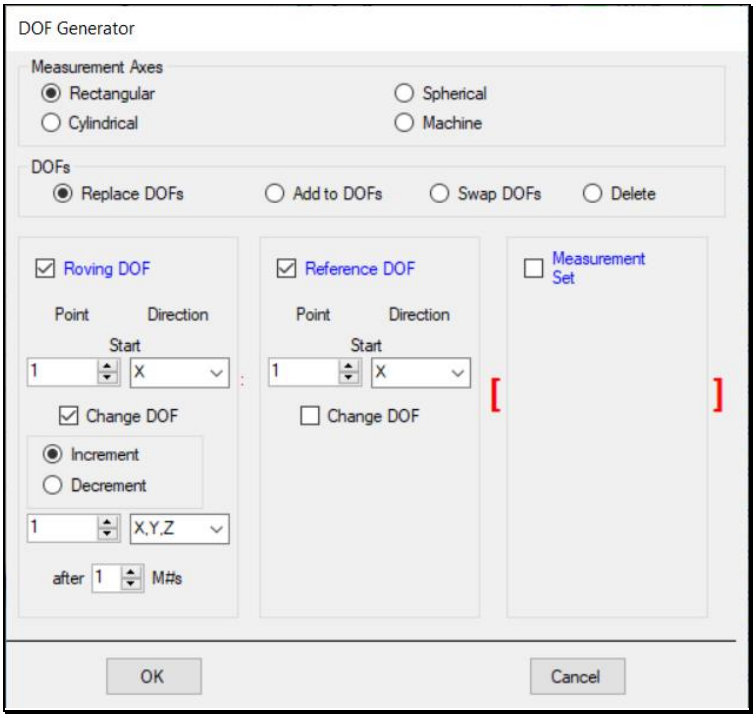
DOFs are displayed in the **DOFs** column of the **M#** spreadsheet.

Using **DOFs** is ***optional***.

DOFs for used by **M# Links | Create Measured Links** to create links by matching **M# DOFs** with **Points & directions** of a Structure model.

DOFs are also used by certain **Advanced Signal Processing** commands.

- ***Double click*** on the **DOFs** column heading to open the **DOF Generator** dialog box.



Each DOF has the format

Roving DOF : Reference DOF [Measurement Set]

The Roving DOF ***precedes the colon*** **":"** and the fixed Reference DOF ***follows the colon*** **":".**

For **vibration** or **acoustic intensity** data, a DOF contains both a **Point number** & **direction** of measurement.

For **scalar** data (temperature, pressure, voltage, current) a DOF contains ***only*** **a Point number**.

The **Measurement Set number** is enclosed in brackets [ ].

Measurement Set numbers are used to designate all measurements that were calculated from data that was ***simultaneously acquired***.

Measurement directions depend on the **type of Measurement Axes** used.

The measurement direction shown in the Table below are used.

Measurement Axes	Direction Symbols
Rectangular	**X**, **Y**, **Z**
Cylindrical	**R** (radial), **T** (tangential), **Z** (axial)
Spherical	**R** (radial), **T** (tangential), **P** (phi angle)
Machine	**H** (horizontal), **V** (vertical), **A** (axial)

Single Channel DOFs

Single channel measurements (e.g. Auto spectrum, PSD) ***only have a*** **Roving DOF**.

To generate **single channel DOFs** using the **DOF Generator**,

- Choose **Measurement Axes** (Rectangular, Cylindrical, Spherical or Machine)
- Choose **Replace DOFs**
- ***Check*** **Roving DOF**, ***un-check*** **Reference DOF**, ***un-check*** **Measurement Set**
- Enter a Point number & Direction in the **Start** boxes under **Roving DOF**
- ***Check*** **Increment** under the Roving DOF

Translation or Rotational Data

- Enter a Point number & direction in the **Increment** boxes under **Roving DOF**

Scalar Data

- Enter a Point number in the **Increment** box under **Roving DOF**

If the DOF list doesn't contain the correct sequence of directions, type in the desired sequence.

- Enter the number of **M#**'s after which the **Roving DOF** is to be incremented
  - For example, if you enter 10, the ***same*** **Roving DOF** will be given to the first **10 M#**'s
- ***Click*** on **OK** to generate new **DOFs**

Cross Channel DOFs

Cross-channel measurements (e.g. **FRF** or Cross Spectrum) have both a Roving DOF and a Reference DOF.

To generate **cross-channel DOFs** using the **DOF Generator**,

- Choose **Measurement Axes** (Rectangular, Cylindrical, Spherical or Machine)
- Choose Replace **DOFs**
- ***Check*** **Roving DOF**, ***check*** **Reference DOF**, ***un-check*** **Measurement Set**
- Setup both the **Roving DOF** and **Reference DOF** sections

Roving Impact Test

If your measurements were acquired using a roving impact hammer,

- Each **Roving DOF** will be a hammer impact Point & direction
- The **Reference DOF** will be the fixed accelerometer DOF

Add To DOFs

Replaces the ***current*** **Roving** & **Reference DOFs** of ***all*** (or ***selected***) **M#s** with the **Roving** & **Reference DOFs** generated by the **DOF Generator**.

Swap DOFs

If your **DOFs** have a ***fixed*** **Roving DOF** and ***variable*** **Reference DOFs**, you may want to swap them.

Delete DOFs

Deletes the **DOFs** of ***all*** (or ***selected***) **M#s**.

File Menu

File | Save Data Block

Saves the Data Block (**BLK**) file into the ***currently open*** **Project file** in memory.

File | Save Data Block with Date Time

Saves the Data Block (**BLK**) file into the ***currently open Project file*** in memory with the current Date & Time in its name.

File | Save Data Block As

Saves a ***copy*** of the Data Block (**BLK**) file with a ***new name*** into the ***currently open*** **Project file** in memory.

File | Save Graphics

Saves the graphics area in the Data Block (**BLK**) window into a file on disk.

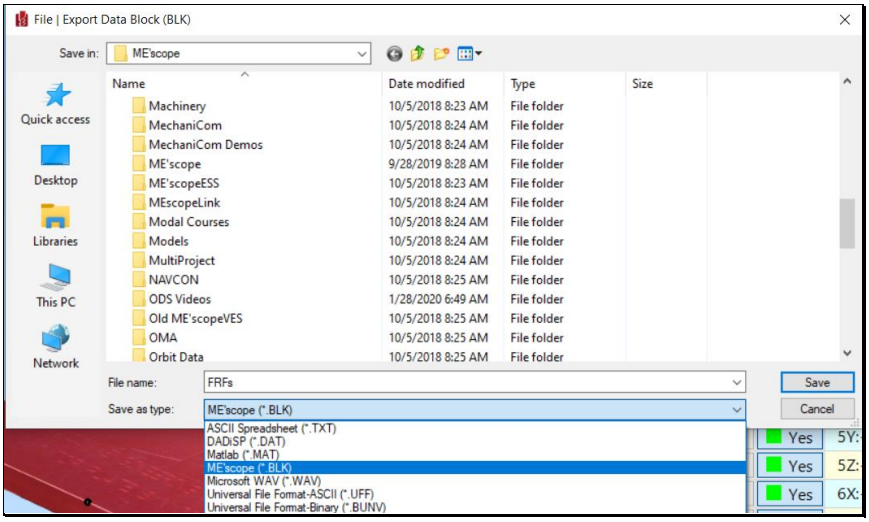
Graphics files can be saved in the JPG, GIF, PNG or BMP file formats

File | Export Data Block

Exports the measurement data in a Data Block (**BLK**) to a disk file in an external file format.

When this command is executed, the Windows File Save As dialog box is opened.

- ***Choose*** an export file format from the **Save as type** list
- ***Choose*** a disk folder for saving the file or create a new one
- Type the desired file name into the **File name** box
- ***Click*** on the **Save** button



Exporting a UFF File

The table below shows the Data Set Types that are created when a Data Block (**BLK**) is exported to a disk file in UFF format.

MEscope File	Type of Data	UFF Data Type
Structure (**STR**)	Structure Points and Lines	15 & 82
Shape Table (**SHP**)	Shapes	55
Data Block (**BLK**)	Time Waveforms, **FRF**s, **Transmissibility**'s, Auto & Cross Spectra, Fourier Spectra.	58

File | Copy to Clipboard | Copy Graphics

Copies the **graphics area** to the Windows Clipboard.

File | Copy to Clipboard | Copy M#s SS

Copies the **M#s** spreadsheet to the Windows Clipboard.

File | Copy to Clipboard | Copy M#s Data

Copies the measurement data values to the Windows Clipboard in the Data Block (**BLK**) Spreadsheet format.

See Importing a Data Block (**BLK**) in Spreadsheet Format for details.

File | Print | Graphics

Prints the Data Block (**BLK**) **graphics area** to the Windows printer.

The installed Windows printer ***must be a graphics printer*** to use this command.

File | Print | M#s Spreadsheet

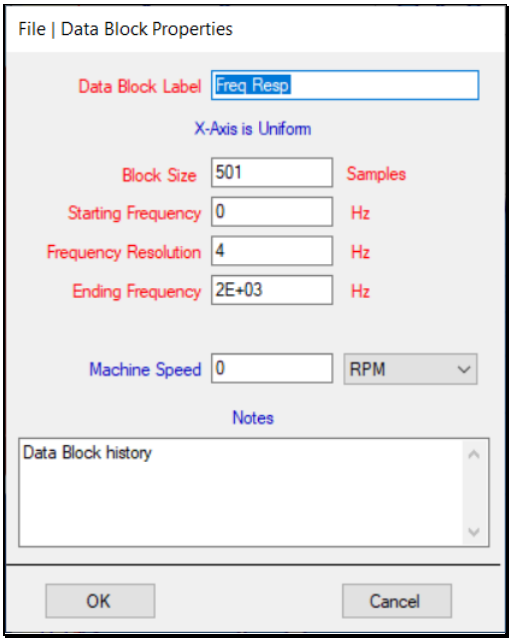
Prints the **M#s** spreadsheet to the Windows printer.

The installed Windows printer ***must be a graphics printer*** to use this command.

File | Data Block Properties

Opens the Data Block (**BLK**) Properties dialog box, wherein you can edit several Data Block (**BLK**) file properties.

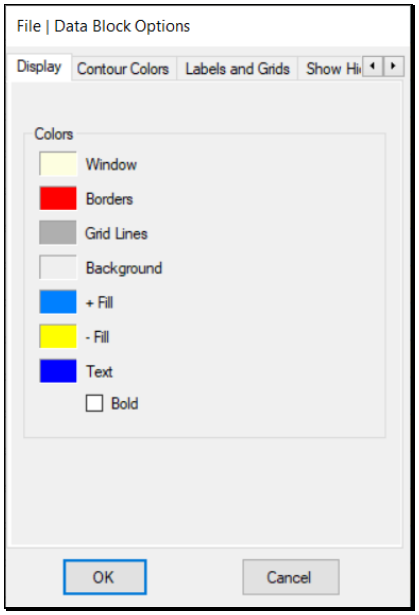
- Editing the **Block Size *changes*** the number of samples for ***all* M#s**
- Editing the Starting, Increment & Ending values *does not change* the M# data
  - Editing these parameters affects the X-Axis
- If a ***non-zero* Machine Speed** is entered, the X-Axis values are displayed as machine **Orders** (multiples of the machine speed)
  - *See* **Format | X-Axis** for details



*Data Block (**BLK**) Properties Box.*

File | Data Block Options

Opens the Data Block Options box.



Data Block Options Dialog Box.

Display Tab

Changes the following Data Block (**BLK**) window properties,

- Window, Borders, Grids, Background, Fill & Text colors

Contour Colors Tab

Used to define contour colors

Contour colors are used by the following commands,

- **Display | Fill Under Graph | Contour Color**
- **Format | Contour Map**
- **Animate | Contours** commands in a ***connected*** Structure **(STR)** window during animation
- **Stable pole groups** on a **Stability** diagram during curve fitting
- If **Animation Groups** that have been defined in a Data Block (**BLK**)

High & Low Contour Limits

Values above or below the data limits are displayed using the high & low limit colors.

High & **Low Limits** are entered into the **High Limit** and **Low Limit** boxes above and below the color bars

- For example, if the **Low Limit = 50** and the **High Limit = 100**, color contours will only be displayed for shape values between **50 & 100**

Contour Colors During Animation

If a Point has shape data in only one direction, or only one of the **Animate | Deflection** directions is ***checked***), contour colors are displayed for shape values between Plus & Minus limits.

If a Point has shape data in more than one direction, contour colors are displayed for shape magnitudes between positive Low & High limits.

Labels & Grids Tab

Displays different items in the graphics area.

- If **Graph Titles, X-axis & Y-axis Label**s is ***checked*** they are displayed
- If **Vertical & Horizontal Grid Lines** is ***checked*** they are displayed
- If **Scroll Tip, M#s, or DOFs** is ***checked*** they are displayed next to the vertical scroll bar

Show Hide Tab

Shows and **hides** columns of the **M#s** spreadsheet .

- C***heck*** columns ***to show*** them, ***un-check*** columns ***to hide*** them
- To display this tab, ***right click*** on the **M#s** spreadsheet and select **Show Hide Columns** from the right click menu

Animation Tab

During Sweep animation from a **BLK** window, the user-specified number of **Sine Dwell Cycles per Shape** is executed before proceeding to the next sample of data.

File | Close Data Block

Closes the Data Block (**BLK**) window.

This window can also be closed by ***clicking*** on the close button  in the ***upper right corner*** of the window

Opening a Window

To open a Data Block (**BLK**) window in the MEscope Work Area, ***double click*** on its name in either pane of the **Current Project Panel**.

Or ***right click*** on its name in either pane of the **Current Project Panel** and execute **Open** from the menu

Importing Data in BLK Spreadsheet Format

Time or Frequency domain data can be imported to MEscope using the **BLK** Spreadsheet **Format (.TXT)**.

Column Format

Each column (or pair of columns) should contain samples of data for a single time or frequency domain measurement function

- Each **single column** is used for ***real*** data, e.g. time waveform or Auto spectrum
- Each **pair of columns** is used for ***complex*** data, e.g. **FRF**, **ODS-FRF**, Cross spectrum

Header Format

The header is ***optional***. If there is ***no header***, each column of data is ***assumed to be a* real valued time waveform**.

Each header line should contain a **Keyword** followed by a **Value**.

A **Value** and its **Keyword** are ***separated by the same delimiter*** used to separate data values in the spreadsheet columns.

Keywords and example **Values** are listed in the Table below

Keyword	Value	Description
Measurement Type	Time Waveform, Fourier Spectrum, Auto & Cross Spectrum, Auto & Cross Correlation, PSD, **FRF**, Coherence, IRF.	**Default:** Time Waveform for time domain, Linear Spectrum for frequency domain. **Time Domain:** each column is a **M#** **Frequency Domain:** each pair of columns is a **M#**
Label	Any text	Data Block (**BLK**) description
X Axis Spacing	Uniform, Non-uniform, No X Data	Uniform (Default): X Start = 0, X Step = 1) Non-uniform: first column is X Axis values
X Axis Units	Any text	X axis time or frequency units
Y Axis Type	Magnitude, Real/Imaginary	For complex data only. Magnitude denotes magnitude & phase, Real/Imaginary denotes real & imaginary data
Measurement Label	Any text	measurement label
Y Axis Units	formatted text	(output units) / or * (input units) Examples: G, G/N, G*G
Y Axis **DOFs**	formatted text	**Roving DOF: Reference DOF [Meas. Set]** Examples: 1Z, 1Z:3Z, 1Z:3Z [1]
Remark	Any text	Not read

*Keywords &Fields of an ASCII Text Data Block (**BLK**) (.TXT) file.*

Creating a (.TXT) File Template

The best way to put measurement data into a (**.TXT**) file format is to start with an MEscope Data Block (**BLK**) file as a template and add your data to it using a spreadsheet or text editing program

- If you want to import time domain measurements, open ***any* time domain** Data Block (**BLK**)
- If you want to import frequency domain measurements, open ***any* frequency domain** Data Block (**BLK**)
- Execute **File | Export Data Block (BLK)** and save the Data Block in (**.TXT**) format

Adding Your Data to the Template

- Open the (**.TXT**) file in a spreadsheet editing program like Microsoft ***Excel*** or a word processor like Microsoft ***Word***
- Replace the measurement data in the spreadsheet columns with your own measurement data
- Edit the other information where applicable and save the file to disk

Make sure that the (**.TXT**) file is no longer open in the spreadsheet editor program before importing it into MEscope

Importing the (.TXT) File

- Execute **File | Import | Data Block** in the MEscope window, and import the (**.TXT**) File into an MEscope Data Block (**BLK**) window

Display Menu

Display | Center Data Block Window

Centers the window in the **Work Area** of the MEscope window.

Repeated execution of this command alternately centers the window and returns it to its former position

Display | M#s SS

Moves the **vertical blue splitter bar** either to the ***left*** to display the **M#s** spreadsheet , or to the ***right*** to hide the spreadsheet .

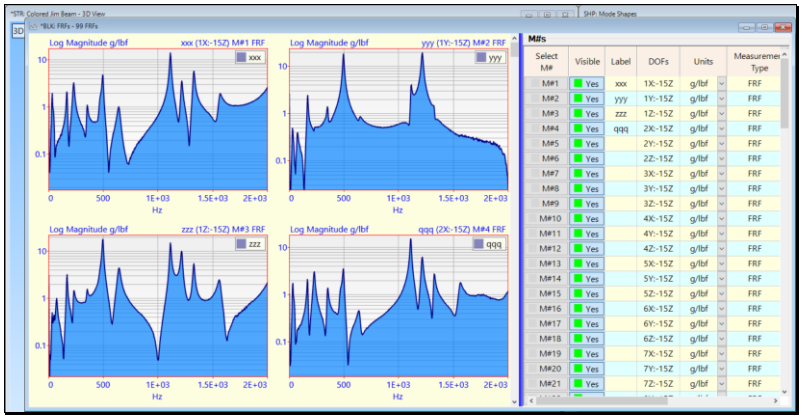
Display | Data Block Toolbars

If ***checked***, the Toolbars are displayed in the Data Block (**BLK**) window.

Display | M# Label on Graph

If ***checked***, the **M#** Label is displayed on each **M#** graph.

M# Labels are viewed and edited in the **M#s** spreadsheet



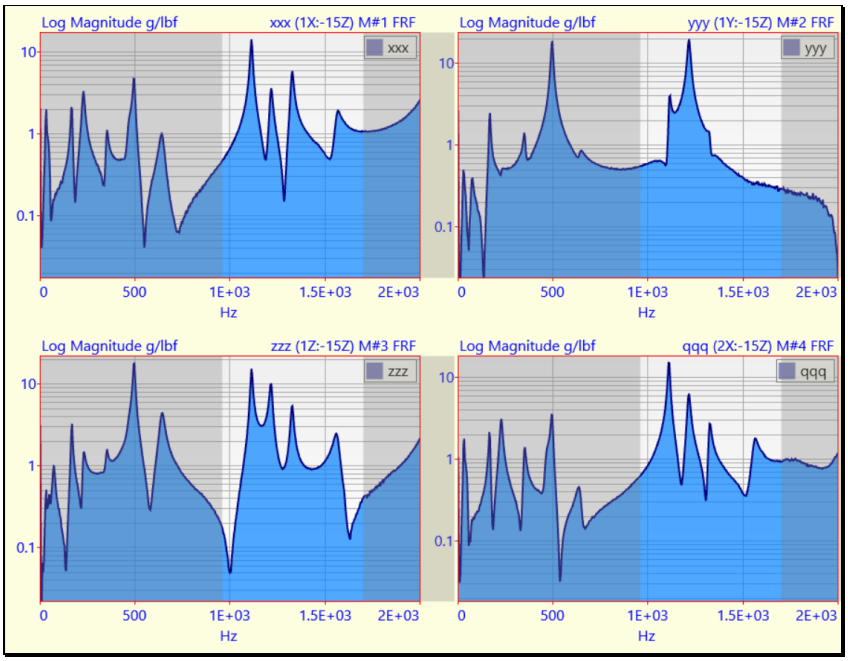
***M#** Label Displayed on Graphs.*

Display | Zoom-In or Zoom-Out

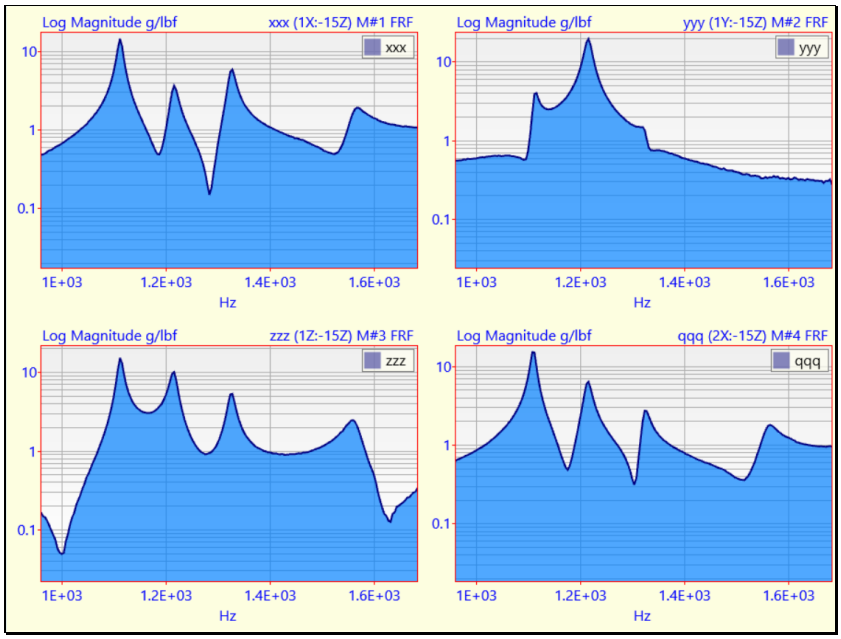
Zoom-In ***expands*** the display of the **M#s** in the graphics area by displaying fewer samples. Zoom-Out ***restores*** the display of all samples.

Zoom-In Operation

- Execute **Display |** Zoom-In to ***enable*** a Zoom operation
- Move the mouse pointer into the ***graphics area***
  - The mouse pointer will change to **(<=>)**
- **Click *& drag*** to draw a **Zoom box** over the area to be zoomed



Graphs During a Zoom-In Operation.



Graphs After a Zoom-In.

Zooming with the Mouse Wheel

- Move the mouse pointer into the ***graphics area***
- ***Click*** on the point to be zoomed about, and ***spin the mouse wheel***

The display will expand in the horizontal direction about the mouse position

Panning After a Zoom

When the graphics display is zoomed, a ***horizontal scroll bar*** is displayed ***at the bottom*** of the graphics area.

To **pan** the display along the X-axis direction,

- ***Right click & drag*** the mouse in the graphics area
- Or use the horizontal scroll bar

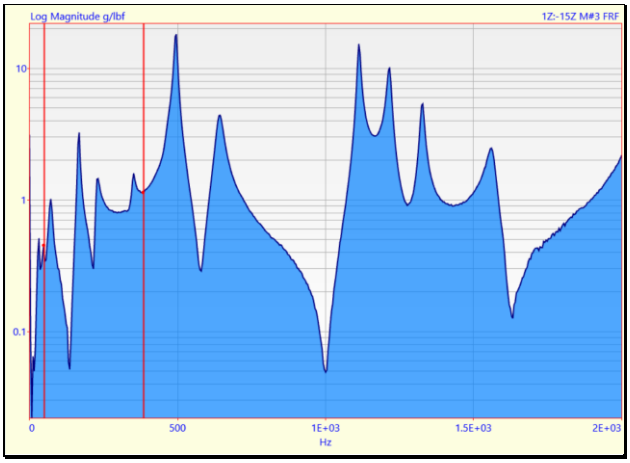
Display | Maximize

Maximizes the ***Y-Axis display*** of the measurements in the graphics area.

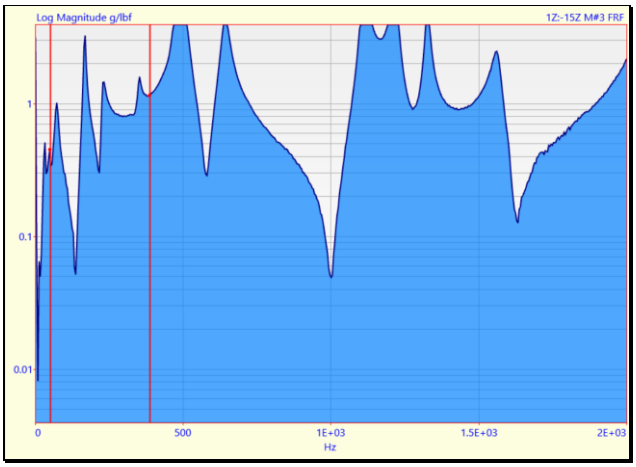
If **M#s** are ***selected***, then only the ***selected*** **M#s** are maximized.

If the **Peak** or **Band** cursor is displayed, the data in the cursor band is maximized.

If the ***Real*** or ***Imaginary*** part of the **M#s** is displayed, ***successive execution*** of this command changes the display between **plus (+)** and **minus (-)** limits of the Y-axis centered about the zero "**0".**



Before ***Display | Maximize***.



After ***Display | Maximize***.

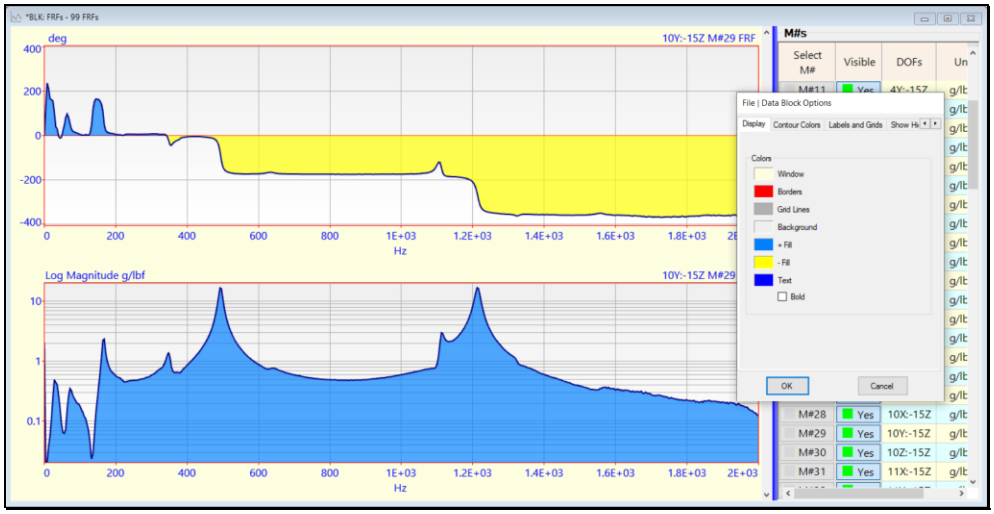
Display | Fill Under Graph | M# Color

If ***checked***, the **Line Color** of each **M#** is used to fill under its graph

Each **M#** color is selected in the **Line Color** column of the **M#s** spreadsheet.

Display | Fill Under Graph | Fill Colors

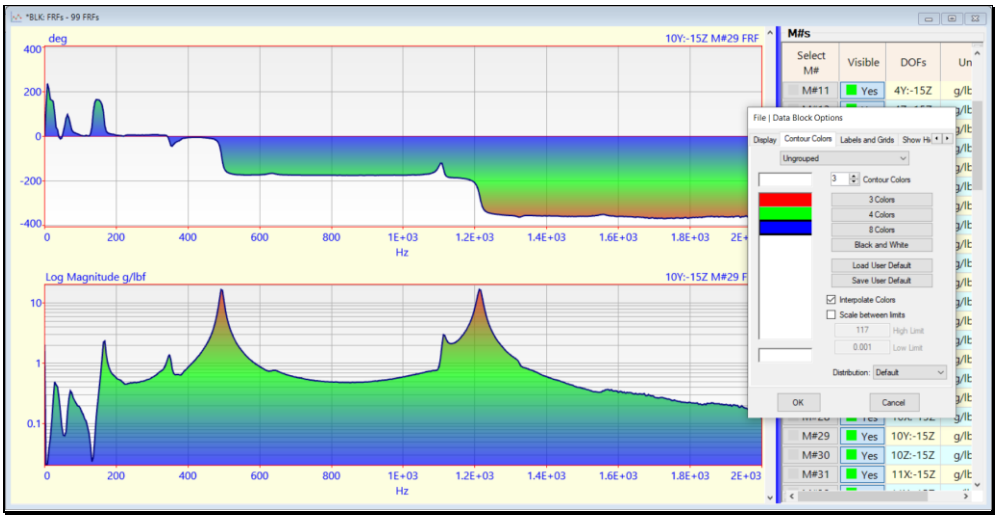
If ***checked***, the **+ Fill** & **- Fill** colors on the **Display** tab of the **File | Data Block Options** box are used to fill under each graph



Display Tab Showing Fill Colors.

Display | Fill Under Graph | Contour Colors

If ***checked***, the colors on the **Contour Colors** tab of the **File | Data Block Options** box are used to fill under each graph



Bode Plot Using Contour Colors to Fill Under the Graph.

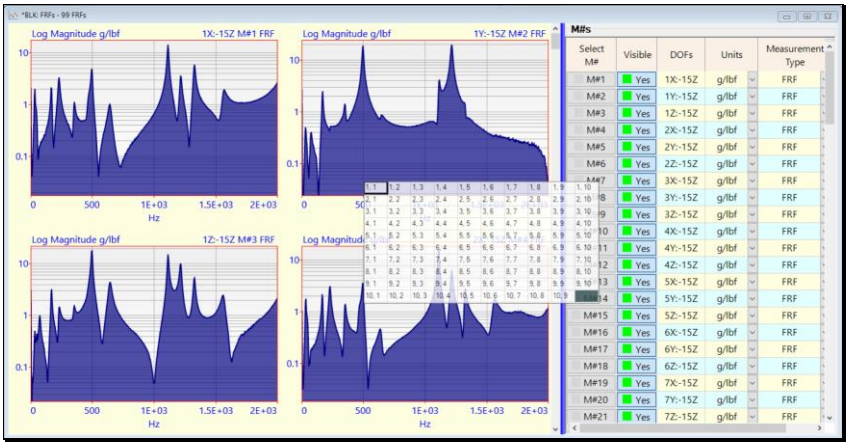
Format Menu

This menu is also displayed when you ***right-click in the graphics area***.

Format | Rows Columns

Displays **M#s** in a **Row & Column** format.

When it is executed, a matrix of **(row, column)** format selections is displayed, as shown below.



***M#s** in Row Column Format.*

Up to **10 rows** and **10 columns** of **M#s** can be displayed together

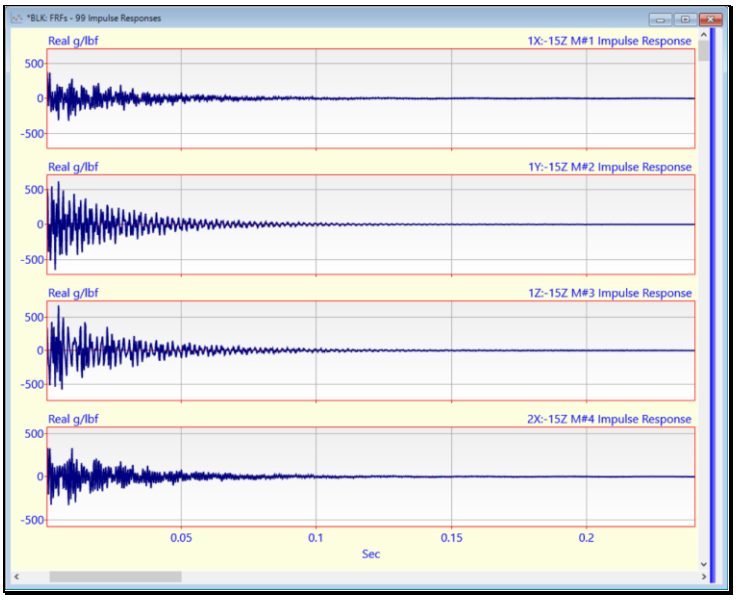
Vertical Scroll Bar

If the number of **M#s** in the Data Block (**BLK**) exceeds the number of **M#s** displayed, a **vertical scroll bar** is displayed on the ***right-hand side*** of the graphics area for displaying the remaining **M#s.**

The **vertical scroll bar** is labeled using either **M#s** or **DOFs,** which is chosen in the **Scroll Tip** section on the **Labels & Grids** tab in the **File | Data Block Options** box.

Format | Strip Chart

Displays ***up to*** **10 M#s** together with a ***common*** **X-Axis** below them.

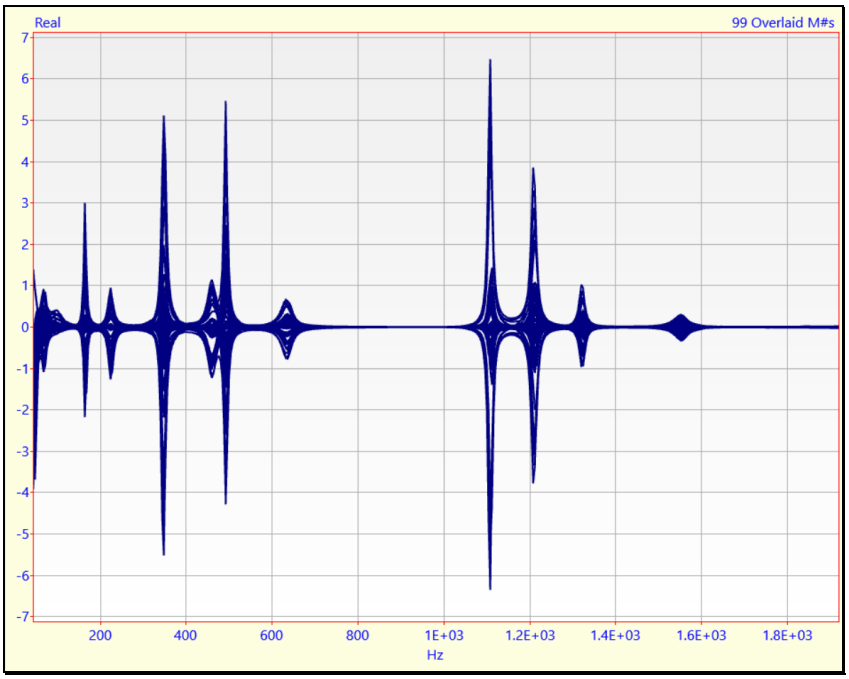


***Strip** Chart Format.*

Format | Overlaid

Displays a ***chosen number of* M#s** in overlaid format.

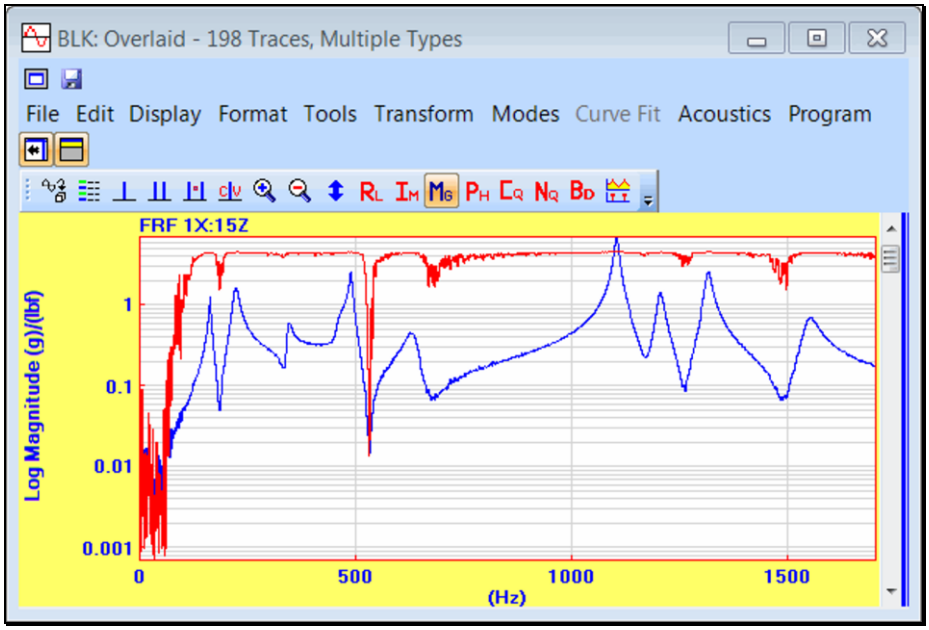
When this command is executed, the **Y-Axis** scaling is changed to **Relative**. See **Format | Y-Axis** for details.



Format | Overlay By DOF

If ***checked***, ***all*** (or ***selected***) **M#s** with the ***same* Roving DOF** are displayed together in **Overlaid** format.

This command is useful for displaying **FRF**s & Coherences together in overlaid format.

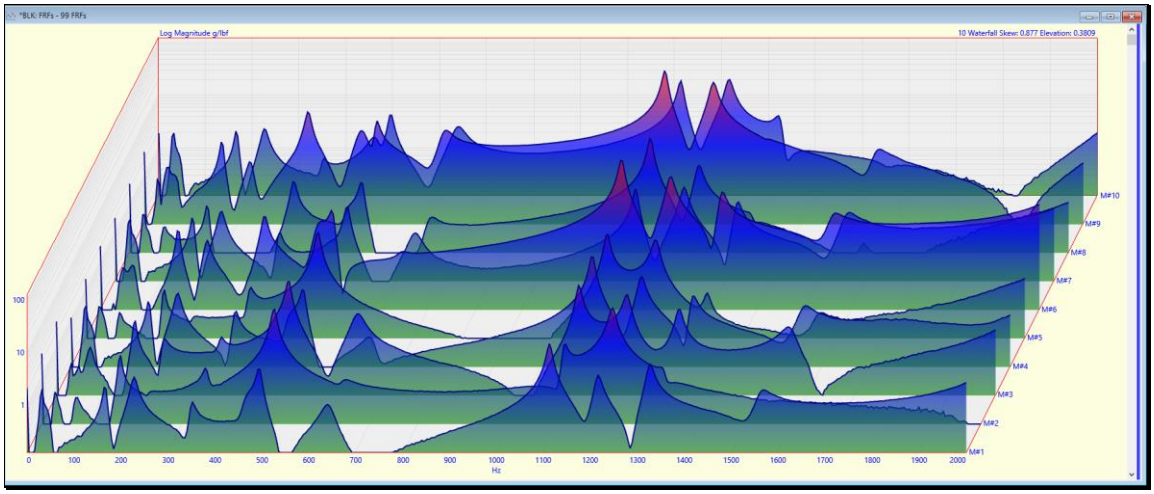


***FRF**s & Coherence Overlaid by DOF.*

Format | Waterfall

Displays a ***chosen number of*** **M#s** in a Waterfall plot.

- To change the angle of the Waterfall axes, place the mouse pointer on the Waterfall Plot, ***right click & drag*** the mouse



Waterfall Plot.

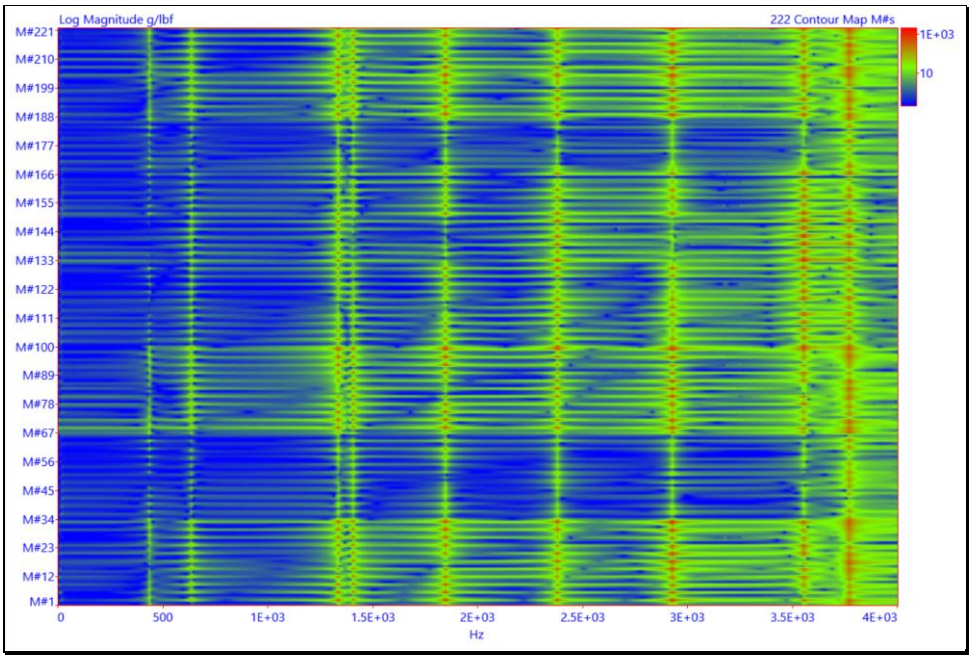
Vertical Scroll Bar

If the number of **M#s** in the Data Block (**BLK**) exceeds the number of **M#s** displayed, a **vertical scroll bar** is displayed on the ***right-hand side*** of the graphics area for displaying the remaining **M#s.**

Format | Contour Map

Displays a ***chosen number of*** **M#s** in a color contour map.

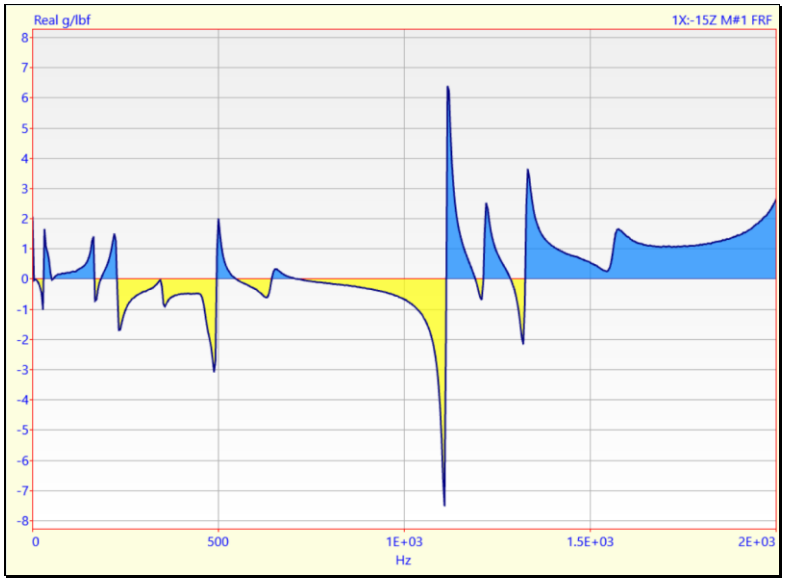
- The colors used for the contour map are chosen in the **Contour Colors** tab in the **File | Data Block Options** dialog box.



Contour Map.

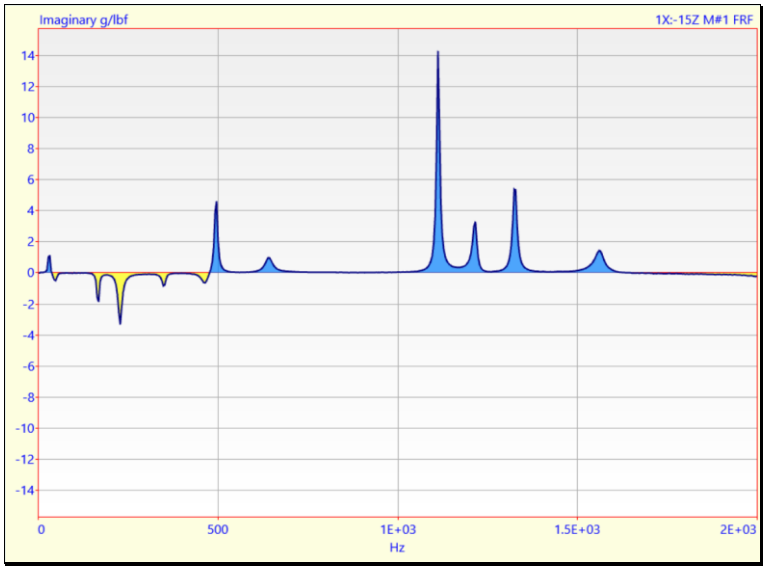
Format | Real

Displays ***real*** measurement data or the **Real Part** of ***complex*** data.



Format | Imaginary

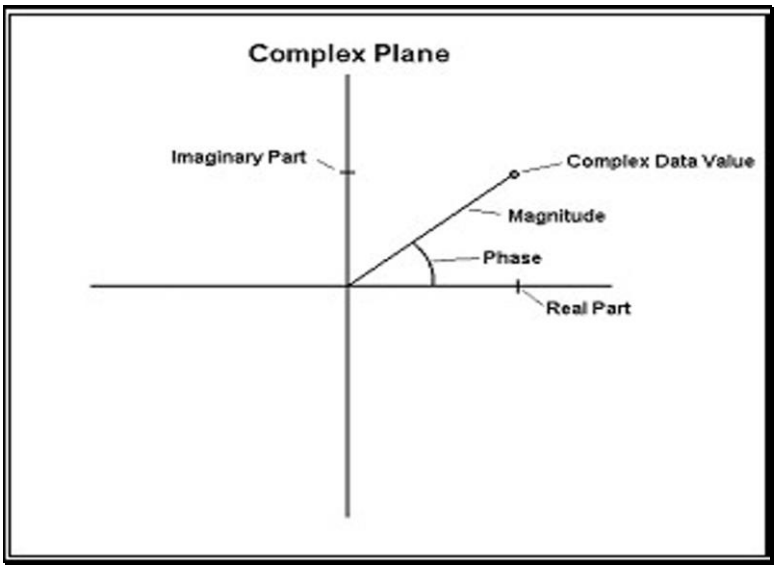
Displays the **Imaginary Part** of ***complex*** measurement data.



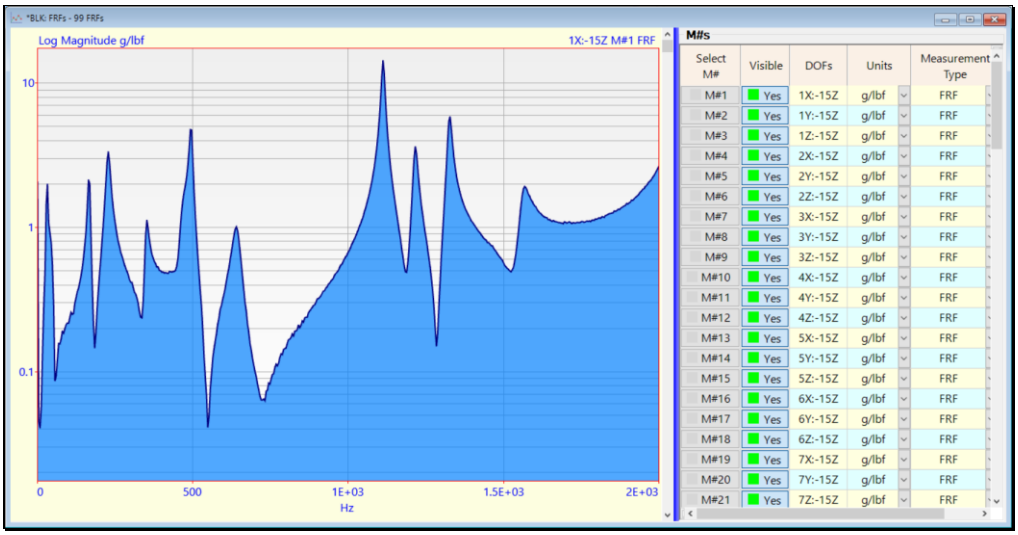
Format | Magnitude

Displays the **magnitude** of the measurement data.

$$\text{Magnitude} = \sqrt{(\text{Real Part})^2 + (\text{Imaginary Part})^2}$$



Real & Imaginary Parts on the Complex Plane.



*Data Block (**BLK**) Window Showing Log Magnitude of an **FRF**.*

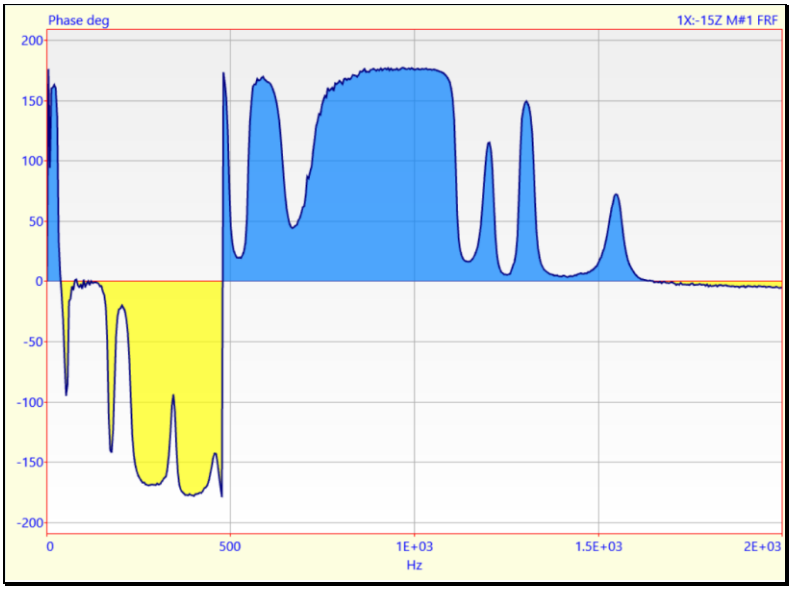
Linear, Log or dB

Magnitudes can be displayed in **Linear, Log** or **dB** (decibels) format. When **Log** or **dB** is chosen, you can also choose the number of decades to display.

Linear, Log, dB & decades choices are made in the **Format	Y-Axis** dialog box

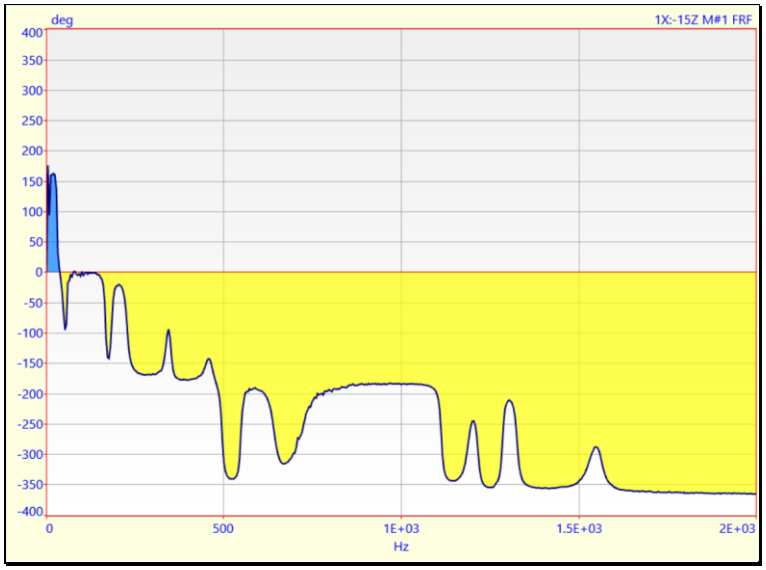
Format | Phase

Displays the **Phase** of ***complex*** measurement data, with values between +180 & -180 degrees.



Format | Unwrapped Phase

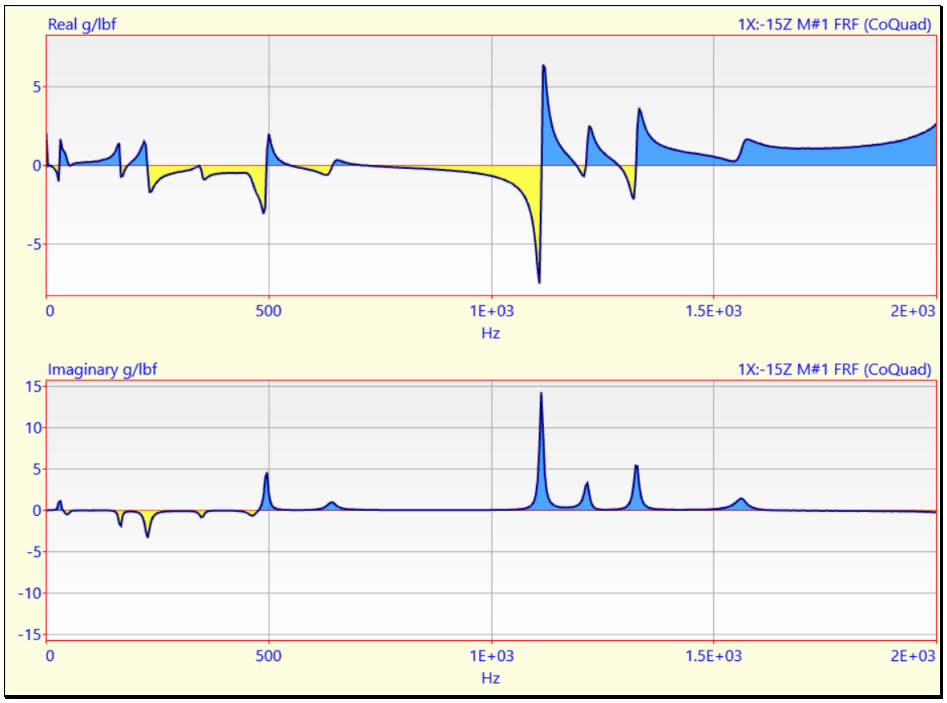
Displays the **Phase** of ***complex*** measurement data, with the phase ***unwrapped around + - 180 degrees***.



Format | CoQuad (Real & Imaginary)

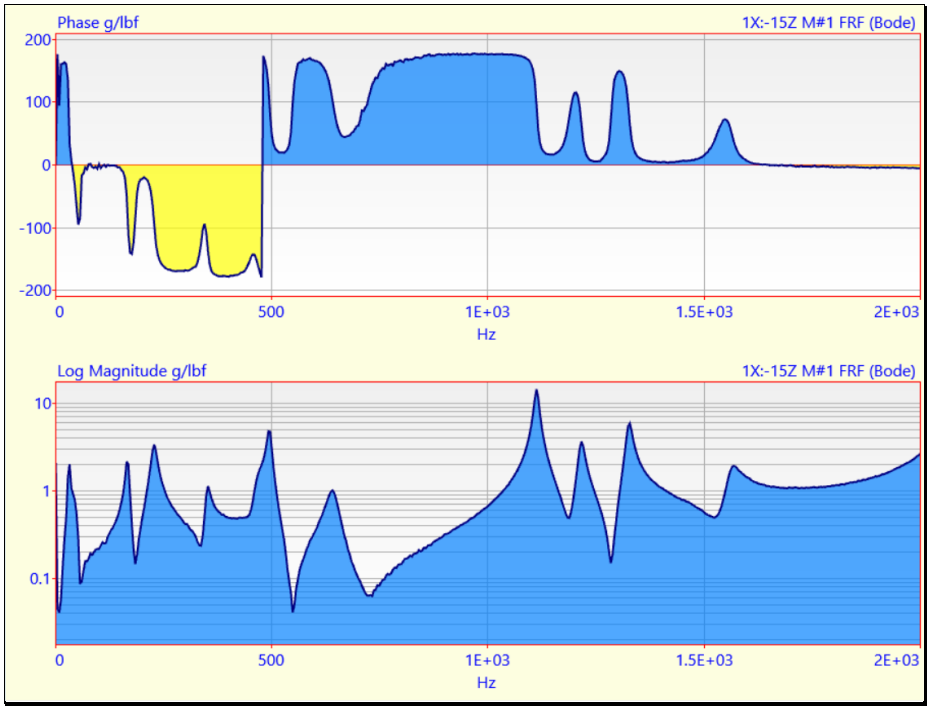
Displays the measurements in CoQuad (**Real & Imaginary**) format.

The **Real** part is also called the **Coincident** waveform.
The **Imaginary** part is called the **Quadrature** waveform.



Format | Bode (Magnitude & Phase)

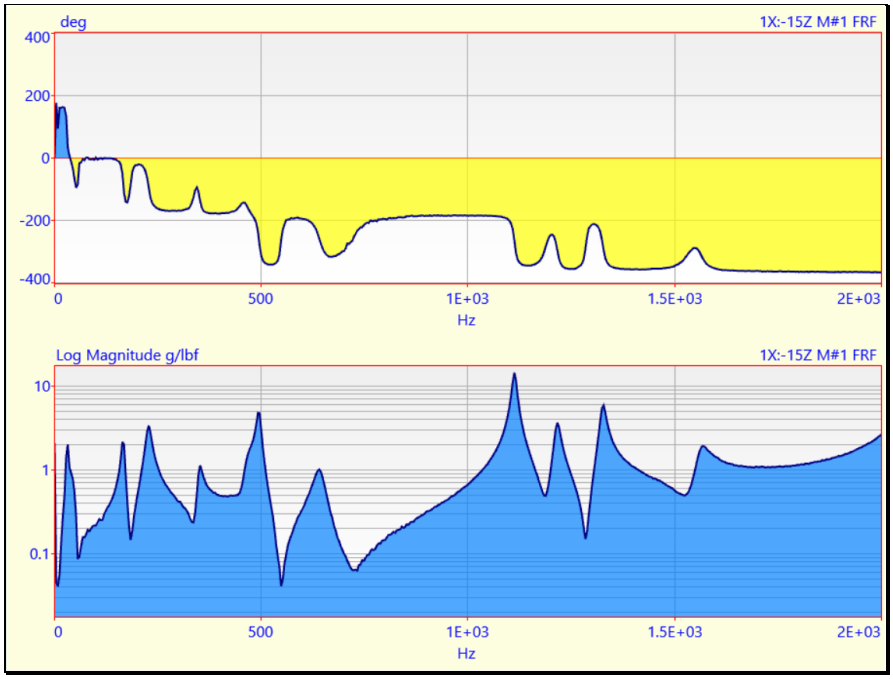
Displays the measurements in Bode (**Magnitude & Phase**) format.



Bode Plot.

Format | Unwrapped Bode

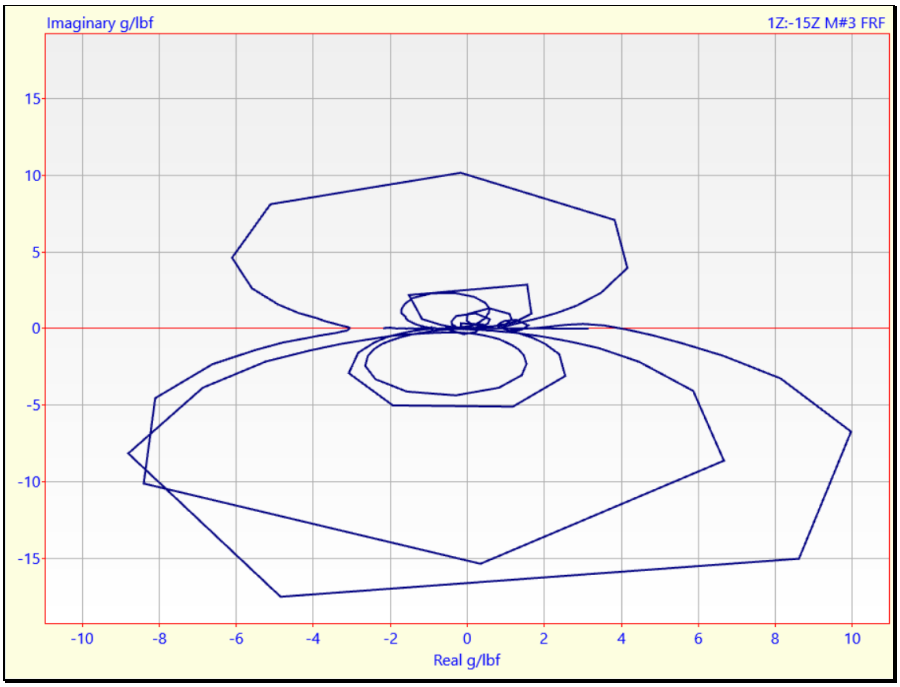
Displays the measurements in Bode (**Magnitude & Phase**) format.



Unwrapped Bode Plot.

Format | Nyquist (Real versus Imaginary)

Displays the **Real** part of each measurement on the ***horizontal*** axis and the **Imaginary** part on the ***vertical*** axis.



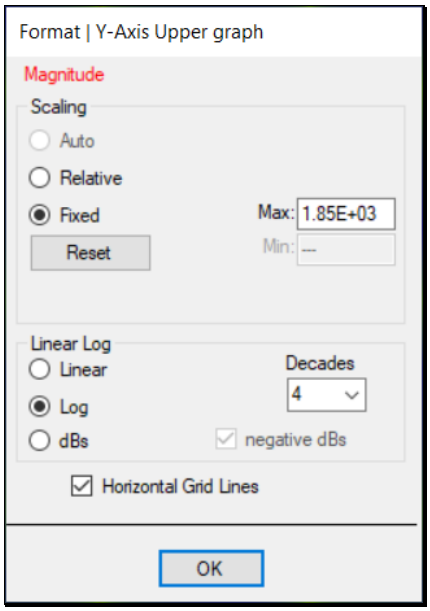
*Nyquist Plot of an **FRF**.*

Format | Y-Axis

Opens the **Y-Axis** format dialog box, which is used for formatting the Y-axis of the graphics display.

This dialog box can also be opened in the following ways,

1. ***Double click*** on the **Y-Axis** area of the graphics display
2. R***ight click*** in the **graphics area** and executing **Format | Y-Axis** from the menu



Y-Axis Scaling

Auto Scale

Displays each **M#** between its ***minimum & maximum*** values.

Relative Scale

Displays each **M#** between the ***minimum & maximum*** values of ***all*** **M#s** in the Data Block (**BLK**).

Fixed Scale

Displays each **M#** between user-defined minimum & maximum limits.

Fixed scaling limits can be defined for the following display formats.

- Real or Imaginary part, Phase, Linear or Log Magnitude, Magnitude in dB

dB Units for Linear versus Power Quantities

- For **Linear (RMS)** quantities (**FRF**s, Fourier Spectra, etc.)

  Magnitude (dB) = 20 Log $_{10}$(Magnitude)

- For **Power (MS)** quantities (Auto Spectra, PSD's, etc.),

  Magnitude (dB) = 10 Log $_{10}$(Magnitude)

Scaling from the M#s spreadsheet

Each **M#** can be scaled by editing its cells in the **Y-axis Scale**, **Fixed Minimum** & **Fixed Maximum** columns of the **M#s** spreadsheet.

1. ***Select*** the ***M#s*** to be scaled
2. ***Double click*** **on the Y-axis Maximum** (or **Y-Axis Minimum**) column heading
3. Enter a value in the dialog box that opens and ***click*** on **OK**

dB Units for Linear versus Power Quantities

Magnitudes can be displayed in dB (decibels) units.

For **Linear (RMS)** quantities, (such as **FRF**s, Fourier Spectra, etc.) the Magnitude is displayed as,

Magnitude (dB) = 20 Log $_{10}$(Magnitude)

For **Power (MS)** quantities (such as Auto & Cross Spectra), the Magnitude is displayed as

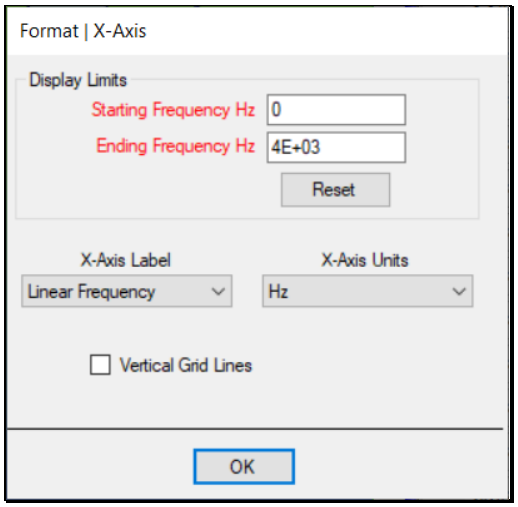
Magnitude (dB) = 10 Log $_{10}$(Magnitude)

Format | X-Axis

Opens the **X-Axis** dialog box which is used for formatting the X-axis of the graphics display.

This dialog box can also be opened in the following ways,

1. ***Double click*** on the **X-Axis** in the graphics area
2. ***Right click*** in the **graphics area** and executing **Format | X-Axis** from the menu



X-Axis Display Limits

The **Starting** & **Ending** limits of the X-Axis display.

All **M#s** are displayed between the **Display Limits** unless the **Reset** button is ***pressed***

X-Axis Label & X-Axis Units

X-Axis Label and X-Axis Units define the X-Axis ***for all*** **M#s** in a Data Block (**BLK**).

Time waveforms can be displayed as **Linear Time**, **Log Time** or **Samples**, with Units of **Seconds**, **Milliseconds** or **Micro-seconds.**

Frequency spectra can be displayed as **Linear Frequency**, **Log Frequency** or **Samples**, with units of **Hz**, **CPS**, **CPM**, or **RPM.**

Cursor Menu

Cursor | Line Cursor

If ***checked***, the Line cursor is displayed as a **vertical red line** on each **M#** graph.

Cursor | Band Cursor

If ***checked,*** the Band cursor is displayed as **two vertical red lines** (or **edges**) on each **M#** graph.

Cursor | Peak Cursor

If ***checked,*** the Peak cursor is displayed as **two vertical red lines (or edges)** on each **M#** graph.

The ***peak sample*** (maximum value of the displayed data) within the cursor band is displayed as a **red dot**.

Cursor | Cursor Values

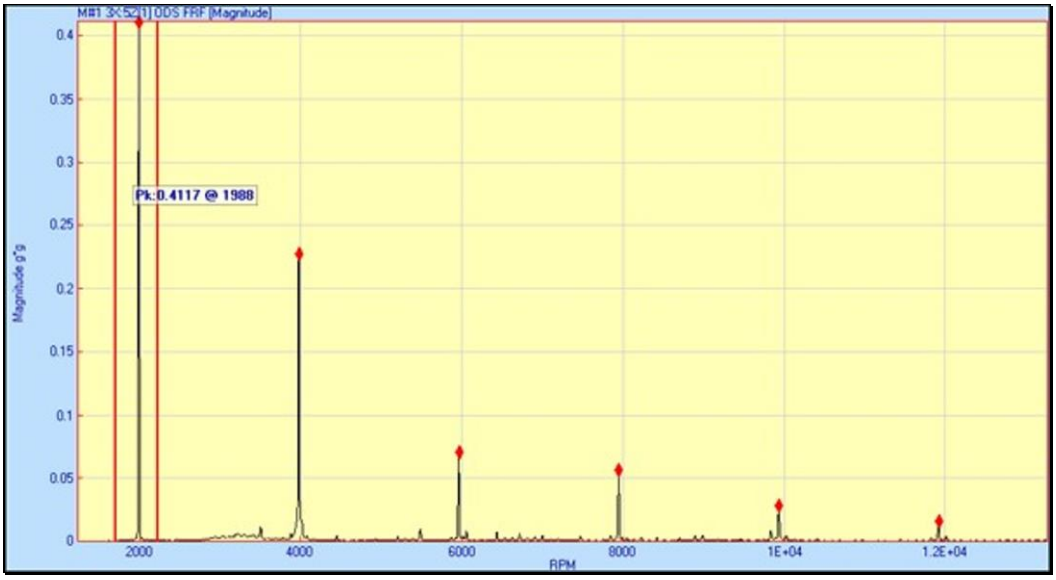
If ***checked,*** the cursor values are displayed in a text box next to the cursor on each **M#** graph.

- ***Hold down*** the **left mouse** button to display cursor values next to the cursor
- ***Click & drag*** to ***move*** the cursor value text box on the display

Cursor | Orders

If ***checked***, all the **visible orders** (**2x**, **3x**, **4x**, etc.) of the **Line** or **Peak** cursor are displayed on each **M#** graph.

Each order is highlighted with a **red dot** at the ***nearest sample*** to the order



*Data Block (**BLK**) Showing Order cursors.*

Cursor | Peak Finder

Displays the current cursor at the ***maximum value*** of the ***displayed*** measurement data.

The Peak Finder finds the peak value within the ***current*** **cursor Bandwidth**.

If the **Peak** or **Band cursor** is displayed, its band is centered around the peak within the ***current*** **cursor Bandwidth**.

If the **Line cursor** is displayed, it will move to the peak within the ***current*** **cursor Bandwidth**.

Using the Peak Finder

- With the **Cursor | Peak Finder** ***checked***, ***click near a peak*** to move the cursor to that peak

Moving the Cursors

- To display the cursor at a desired position, place the mouse pointer at the position on an **M#** graph and ***click*** the **left mouse button**
- To move the cursor to a desired position, Place the mouse pointer anywhere on an **M#** graph and ***click & drag*** **the mouse**

Moving the Band or Peak cursor

- Place the mouse pointer ***inside the band*** and ***click & drag***

Moving one edge of the Band or Peak cursor

- Place the mouse pointer outside the band near the edge and click & drag

Animating the ODS from the Cursor Position

The **Line**, **Peak** or **Band** cursor ***must be displayed*** in order to animate an Operating Deflection Shape (**ODS**) in the ***connected*** Structure (**STR**) window from the cursor position in a Data Block (**BLK**) or Acquisition (**ACQ**) window.

If the **Line cursor** is displayed, the measurement values at the cursor position are displayed as the **ODS** in a ***connected*** Structure **(STR)** window.

If the **Peak cursor** is displayed, the measurement values at the ***peak*** in each **M#** are displayed as the **ODS** in a ***connected*** Structure **(STR)** window**.**

If the **Band cursor** is displayed, the measurement values in the cursor band are ***summed together*** for each **M#** and displayed as the **ODS** in a ***connected*** Structure **(STR)** window.

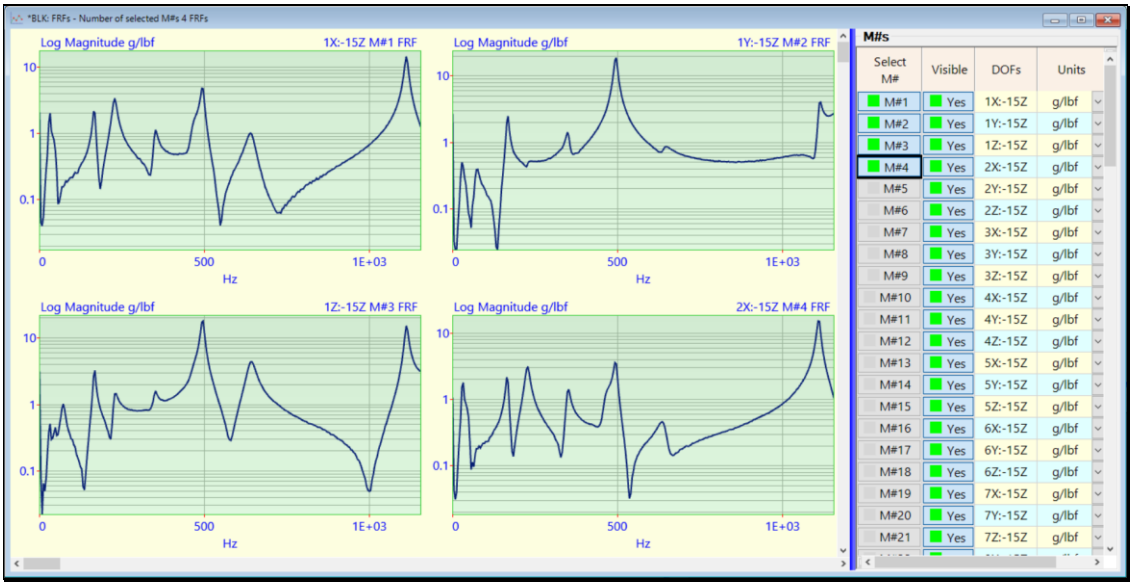
M#s Menu

This menu is also displayed when you ***right-click in the graphics area***.

M#s | Select Menu

Most Data Block (**BLK**) window commands operate on ***all*** (or ***selected***) **M#s.**

A ***selected*** **M#** is displayed with a **green background** in the graphics area**,** and its **Select** button is ***depressed*** in the **M#s** spreadsheet.

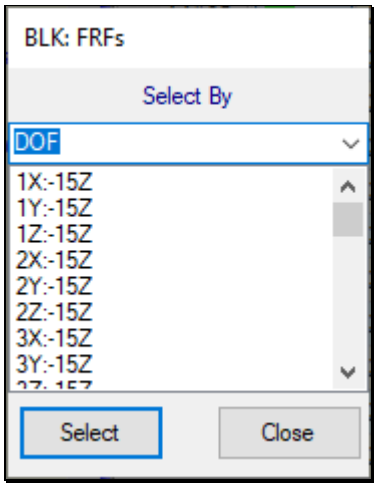


*Data Block (**BLK**) Showing Four Selected **M#s**.*

M#s | Select | Select By

When this command executed, a dialog box will open containing a list of options for selecting **M#s**.

- Choose a method from the **Select By** list
- Choose items from the selection list below the **Select By** list
- **Hold down** the **Shift** or **Ctrl key** to make ***multiple*** selections
- ***Click*** on **Select** to ***select*** **the M#s**



Start and Skip M#s

Opens another dialog box wherein you can enter a **Starting M#** and a **Skip M#s** (number of **M#s** to skip over) for ***selecting* M#s**.

- The default values are **Starting M# = 1**, and **Skip M#s = 0**

By Units

***Selects* M#s** by their Engineering Units.

Engineering Units are listed in the **Units** column in the **M#s** spreadsheet.

By DOF

***Selects* M#s** by their DOF.

DOF ➔ Roving DOF : Reference DOF [Measurement Set]

***Single channel* M#s** have only a Roving DOF.

***Cross channel* M#s** have a Roving & Reference DOF.

Measurement Set numbers are required when data is acquired in **multiple measurement sets**.

DOFs are displayed in the **DOFs** column in the **M#s** spreadsheet.

By Roving DOF

***Selects* M#s** by their Roving DOF.

DOF ➔ **Roving DOF** : Reference DOF

By Reference DOF

***Selects* M#s** by their Reference DOF.

DOF ➔ Roving DOF : **Reference DOF**

By Point

Selects* M#s** by their ***Roving DOF Point number.

DOF ➔ Roving (**Point Number** & Direction) : Reference DOF

By Direction

Selects* M#s** by their ***Roving direction.

DOF ➔ Roving (Point Number & **Direction**) : Reference DOF

By Rectangular Matrix DOFs

Selects* M#s** that form a ***rectangular matrix of rows & columns based on their **DOFs**.

Roving DOFs correspond to ***rows*** of the rectangular matrix.

Reference DOFs correspond to ***columns*** of the rectangular matrix.

By Measurement Type

***Selects* M#s** by their Measurement Type.

Measurement Types are listed in the **Measurement Type** column in the **M#s** spreadsheet

By Measurement Set

***Selects* M#s** by their Measurement Set number.

DOF ➔ Roving DOF : Reference DOF **[Measurement Set]**

By Data Type

***Selects* M#s** by their Data Type.

Data Types are listed in the **Data Type** column in the **M#s** spreadsheet.

By Label

***Selects* M#s** by their text Label.

Labels are listed in the **Label** column in the **M#s** spreadsheet.

By Input Output

Selects **M#s** by their Input Output property.

Input Output is listed in the **Input Output** column in the **M#s** spreadsheet.

By Group

***Selects* M#s** by their **Group** name.

Group names are listed in the **Group** column in the **M#s** spreadsheet.

By Date Time

***Selects* M#s** by their Date Time.

Date Times are listed in the **Date Time** column in the **M#s** spreadsheet.

M#s | Select | Select All or Select None

Selects or ***un-selects all* M#s**.

M#s | Select | Invert Selection

Inverts the **M# *selection***.

- All ***selected* M#s** are ***un-selected***, and all ***un-selected* M#s** are ***selected***

M#s | Sort Menu

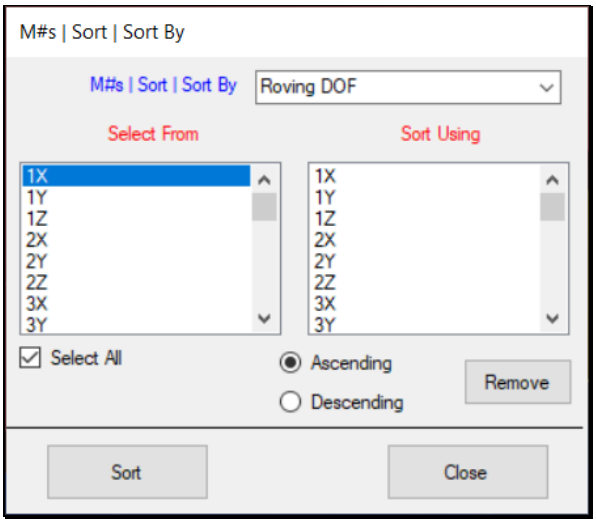
Each measurement has a ***unique* M#,** which is **its row** in the **M#s** spreadsheet.

The **M# Links** in a ***connected* STR** window retrieve data from each **M#** to display as an **ODS** in animation.

M#s | Sort | Sort By

When executed, a dialog box will open containing a list of options to sort by,

- Choose a sorting option from the **Sort By** list
- Choose items from the **Select From** list, or ***check* Select All** to choose all items in the **Select From** list
- Use **Ascending, Descending**, and the **Remove** button to obtain the desired **Sort Using** list
- ***Click*** on **Sort** to sort the **M#s**



*Sort **M#s** By Dialog box.*

By Units

Sorts **M#s** by their Engineering Units.

Engineering Units are listed in the **Units** column in the **M#s** spreadsheet'

By DOF

Sorts **M#s** by their DOF.

DOF ➔ Roving DOF : Reference DOF [Measurement Set]

Single channel measurements have only a **Roving DOF.**

Cross channel measurements have a **Roving** and a **Reference** DOF.

Measurement Set numbers are required when data is acquired in ***multiple measurement sets***.

DOFs are displayed in the **DOFs** column in the **M#s** spreadsheet.

By Roving DOF

Sorts **M#s** by their Roving DOF.

DOF ➔ **Roving DOF :** Reference DOF

By Reference DOF

Sorts **M#s** by their Reference DOF.

DOF ➔ Roving DOF **: Reference DOF**

By Point Number

Sorts **M#s** by their ***Roving DOF*** Point number.

DOF ➔ Roving (**Point Number** & Direction) : Reference DOF

By Direction

Sorts **M#s** by their ***Roving*** direction of measurement.

DOF ➔ Roving (Point Number & **Direction**) : Reference DOF

By Rectangular Matrix DOFs

Sorts **M#s** that form a **rectangular matrix** of ***rows & columns*** based on their **DOFs**.

> ***Roving* DOFs** correspond to **rows** of the rectangular matrix.
>
> ***Reference* DOFs** correspond to **columns** of the rectangular matrix.

By Measurement Type

Sorts **M#s** by their Measurement Type.

> Measurement Types are listed in the **Measurement Type** column in the **M#s** spreadsheet.

By Measurement Set

Sorts **M#s** by their **Measurement Set** number.

DOF ➔ Roving DOF : Reference DOF **[Measurement Set]**

By Data Type

Sorts **M#s** by their Data Type.

> Data Types are listed in the **Data Type** column in the **M#s** spreadsheet.

By Label

Sorts **M#s** by their text **Label**.

> Labels are listed in the **Label** column in the **M#s** spreadsheet.

By Input Output

Sorts **M#s** by their **Input Output** property.

> Input Output is listed in the **Input Output** column in the **M#s** spreadsheet.

By Source

Sorts **M#s** by their **Source** name.

> Source names are listed in the **Source** Name column in the **M#s** spreadsheet.

By Date Time

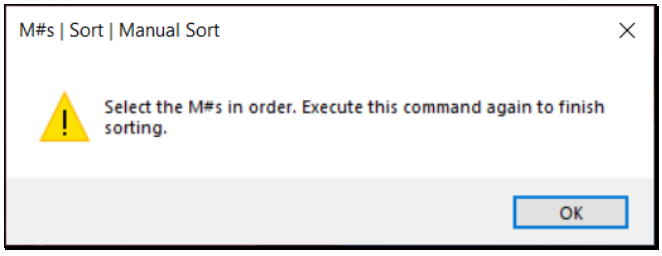
Sorts **M#s** by their **Date Time**.

> Date times are listed in the **Date Time** column in the **M#s** spreadsheet.

M#s | Sort | Manual Sort

Enables manual sorting of measurements by ***selecting*** them in a desired order.

When this command is executed, a dialog box is opened with in**STR**uctions for ***selecting* M#s**



*Dialog Prior to a Manual Sort of **M#s**.*

- **Hold down** the **Ctrl** key and ***click*** on each graph in the desired order
- Or ***depress*** the **Select M#** buttons in the desired order, in the first column in the **M#s** spreadsheet

After all the **M#s** have been ***selected***,

- Execute this command ***again*** to sort the measurements in the order in which they were ***selected***

All ***un-selected*** **M#s** follow the ***selected*** **M#s** in the new sorted order in the **M#s** spreadsheet.

M#s | Move M#s Up or Down

Moves the ***selected*** **M#s** upward (or downward) in the **M#s** spreadsheet with each execution of this command.

Use this command to manually order of the **M#s** so that the properties of measurements of interest are listed near the top of the **M#s** spreadsheet.

M#s | Delete selected

Deletes (removes) ***selected*** **M#s** from a Data Block (**BLK**).

M#s | Cut to File

Cuts (deletes) ***selected*** **M#s** from the Data Block (**BLK**) and puts them into another Data Block (**BLK**) file.

M# Links

Measurement numbers (**M#s**) in the **M# Links** are used when animating **ODS**'s from a Data Block (**BLK**)

If **M#s** are cut from one Data Block (**BLK**) into another Data Block (**BLK**), new **M#** Links must be created in the ***connected*** Structure **(STR)** window in order to animate shapes from the new Data Block (**BLK**).

Data in the Cursor Band

If the **Band cursor** is displayed, you are given the choice of copying only the data in the cursor band.

- ***Press*** **Yes** to cut only the samples in the cursor band
- ***Press*** **No**, to cut ***all*** samples of the ***selected*** **M#s**

M#s | Copy to File

Copies ***all*** (or ***selected)*** **M#s** from the Data Block (**BLK**) into another Data Block (**BLK**) file.

M# Links

Measurement numbers (**M#s**) in the **M# Links** are used when animating **ODS**'s from a Data Block (**BLK**)

If **M#s** are copied from one Data Block (**BLK**) into another Data Block (**BLK**), new **M#** Links must be created in the ***connected*** Structure **(STR)** window in order to animate shapes from the new Data Block (**BLK**).

Data in the Cursor Band

If the **Band cursor** is displayed, you are given the choice of copying only the data in the cursor band.

- ***Press*** **Yes** to copy the samples in the cursor band
- ***Press*** **No**, to copy ***all*** samples of ***all*** (or ***selected)*** **M#s**

M#s | Paste from File

Pastes **M#s** from another Data Block (**BLK**) into the Data Block (**BLK**) in which it is executed.

The pasted **M#s** are ***added to the end*** of the **M#s** currently in the Data Block (**BLK**).

If **M#s** are ***selected*** in the **paste from** Data Block (**BLK**), only the ***selected*** **M#s** are pasted

M# Links

Measurement numbers (**M#s**) in the **M# Links** are used when animating **ODS**'s from a Data Block (**BLK**).

If **M#s** are pasted from one Data Block (**BLK**) into another Data Block (**BLK**), new **M#** Links must be created in the ***connected*** Structure **(STR)** window in order to animate shapes from the new Data Block (**BLK**).

Interpolated Samples

If the X-axis in the **Paste from** Data Block (**BLK**) does not match the X-axis values of the **Paste To** Data Block (**BLK**), each **Paste From** measurement ***is interpolated*** so that its X-axis values match those of the P**aste To** Data Block (**BLK**).

M#s | Paste at Cursor

Pastes data from another Data Block (**BLK**) into the Data Block (**BLK**) in which it is executed ***starting at the Line cursor*** position.

- The pasted data is added to the samples of each **M#** in the Data Block (**BLK**), starting at the **Line cursor** position
- If **M#s** are ***selected*** in the **Paste from** Data Block (**BLK**), then only data from the ***selected*** **M#s** is pasted

Edit Menu

This menu is also displayed when you ***right-click in the graphics area***.

Edit | Undo

Restores the window to the state it was in ***before*** the ***last*** operation.

This command can be used repeatedly to undo the last **N** operations, **N** = **Number of edits saved**.

The Number of edits saved is changed on the General tab in the Project | MEscope Options dialog box.

Edit | Redo

Restores the window to the state it was in ***before*** the ***last execution*** of the **Edit | Undo** command.

Tools Menu

This menu is also displayed when you ***right-click in the graphics area***.

Tools | Save Shapes

Saves shape data at the ***current*** **cursor position** into a Shape Table (**SHP**) file

If the **Line cursor** is displayed, the **M#** values at the cursor position are saved.

If the **Peak cursor** is displayed, the value at the ***peak*** in each **M#** are saved.

If the **Band cursor** is displayed, the **M#** values in the cursor band are ***summed together*** for each **M#** and saved.

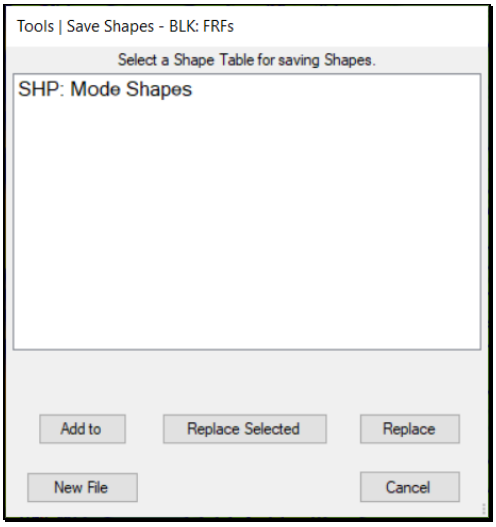
If the **Order cursors** are displayed, the measurement values at ***each visible order*** are saved as a ***separate shape*** in a Shape Table.

If **Format | Real** is ***checked***, only the **Real** part of the data is saved.

If **Format | Imaginary** is ***checked***, only the **Imaginary** part of the data is saved.

Otherwise, the **complex data** is saved.

When this command is executed, a dialog box opens, as shown below



Shape Table Selection Box.

Add to Shapes

- Press **Add to** to add the shape as a new shape to the Shape Table.

Matching DOFs

The **DOFs** of the new shape are matched with the **DOFs** in the Shape Table. If a DOF ***does not match***, a new DOF is created in the Shape Table.

Replace Shapes

- ***Press*** **Replace** to replace ***all the shapes*** in the Shape Table with the new shape.

Replacing Selected Shapes & M#s

To replace selected shapes and selected **M#s** in the Shape Table with the new shape,

- ***Select*** the shapes in **Shapes** spreadsheet to be replaced
- ***Select*** the **M#s** in the **M#s** spreadsheet to be replaced
- Execute **Tools | Save Shapes**
- ***Press*** the **Replace Selected** button in the Shape Table Selection box

Script Menu

Script | Display | Cursor

Displays and positions the cursor in a Data Block (**BLK**) window.

Parameters

- (Line, Band, Peak, None)
- Position
  - Percentage (1 to 100) of the **Block Size**
  - Sample (1 to the **Block Size**)
  - Horizontal Axis Units (Hz, RPM, CPM, Sec, Milli-sec, micro-sec)
- Bandwidth
  - (Percentage, Sample, Horizontal Axis Units)

Script | Display | Zoom

Zooms the display in a Data Block (**BLK**) window.

Parameters

- Zoom start
  - Percentage (1 to 100 of the **Block Size**)
  - Sample (1 to the **Block Size**)
  - X-Axis Units (Hz, RPM, CPM, Sec, milli-sec, micro-sec)
- Zoom end
  - Percent, Samples, X-Axis Units)

Script | Display | Sine Dwell Cycles per Shape

Sets the number of Sine Dwell Cycles per Shape during Sweep Animation from a Data Block (**BLK**).

- During **Sweep animation** from a Data Block (**BLK**), the specified number of **Sine Dwell Cycles per Shape** is carried out before displaying the next shape.

Parameter

- Number of Cycles

Script | M#s | Select an M#

Selects (or ***un-selects***) a single **M#** in the **M#s** spreadsheet .

Parameters

- ***M#*** (can also be a Script Variable)
- **Select** (Yes or No)
- Un-select All First (Yes or No)

Script | M#s | Select

Selects (or ***un-selects***) a range of **M#s** in the **M#** spreadsheet .

Parameters

- ***M#s*** (1,2, 3,,,; 1-3; all)
- **Select** (Yes or No).
- Un-select All First (Yes or No)

Script | M#s | Color

Changes the **color** of ***all*** (or ***selected***) **M#s** in a Data Block (**BLK**).

Parameter

- Color (from color pallet)

Script | M#s | Label

Changes the **label** of ***all*** (or ***selected***) **M#s** in a Data Block (**BLK**).

Parameter

- Label (text)

Script | M#s | DOFs

Changes the **DOFs** of ***all*** (or ***selected***) **M#s** in a Data Block (**BLK**).

Parameter

- **DOFs** (1X, 1Y, 1Z ,...)

Script | M#s | Units

Changes the **units** of ***all*** (or ***selected***) **M#s** in a Data Block (**BLK**).

Parameters

- Units (g, N, lbs,)
- Re-scale **M#s** (Yes or No)

Script | M#s | Measurement Type

Changes the **Measurement Type** of ***all*** (or ***selected***) **M#s** in a Data Block (**BLK**).

Parameter

- Type (**FRF**, Auto spectrum)

Script | M#s | Input Output

Changes the **Input Output** of ***all*** (or ***selected***) **M#s** in a Data Block (**BLK**).

Parameter

- **Input Output** (Input, Output, Both, Cross)

Script | M#s | Line Width

Changes the **Line Width** of ***all*** (or ***selected***) **M#s** in a Data Block (**BLK**).

Parameter

- **Line Width** (1 to 9)

Script | M#s | Visibility

Makes ***all*** (or ***selected***) **M#s *visible*** (or ***invisible***) in a Data Block (**BLK**).

Parameter

- **Visible** Yes or No)

Script | M#s | Linear Power

Changes the ***Linear Power*** property of ***all*** (or ***selected***) **M#s** in a Data Block (**BLK**).

Parameter

- Linear or Power

Script | M#s | Group

Gives a Group name to ***all*** (or ***selected***) **M#s** in a Data Block (**BLK**).

Parameter

- Group text name

Script | M#s | dB Reference

Gives a dB reference value to ***all*** (or ***selected***) **M#s** in a Data Block (**BLK**).

Parameter

- dB Reference value

Script | M#s | Copy Cells to Clipboard

Copies parameters from cells of the **M#s** spreadsheet to the Windows Clipboard.

Parameters

- Top Left Row
- Top Left Column
- Bottom Right Row
- Bottom Right Column

Script | M#s | Paste Clipboard into Cells

Pastes data from the Windows Clipboard into cells of the **M#s** spreadsheet .

Parameters

- Top Left Row
- Top Left Column
- Bottom Right Row
- Bottom Right Column

Script | M#s | Copy Cell to Variable

Copies a parameter from the **M#s** spreadsheet to a Global Variable.

Parameters

- Row
- Column
- Variable Name

Script | M#s | Paste Variable to Cell

Pastes a Global Variable value into an **M#** parameter in the **M#s** spreadsheet .

Parameters

- Row
- Column
- Variable Name

Script | Get | M# Count to Variable

Stores the number of **M#s** in a Data Block into a Script Variable.

Parameter

- Variable Name

Script | Get | Block Size to Variable

Stores the number of samples in a Data Block into a Script Variable.

Parameter

- Variable Name

Script | Get | Selected M# Count to Variable

Stores the number of ***selected* M#s** in a Data Block into a Script Variable.

Parameter

- Variable Name

Script | Get | Next Selected M# to Variable

Stores the ***next selected* M#** (starting after an **M#)** in a Data Block into a Script Variable.

Parameters

- Start After M# (number or variable)
- Variable Name