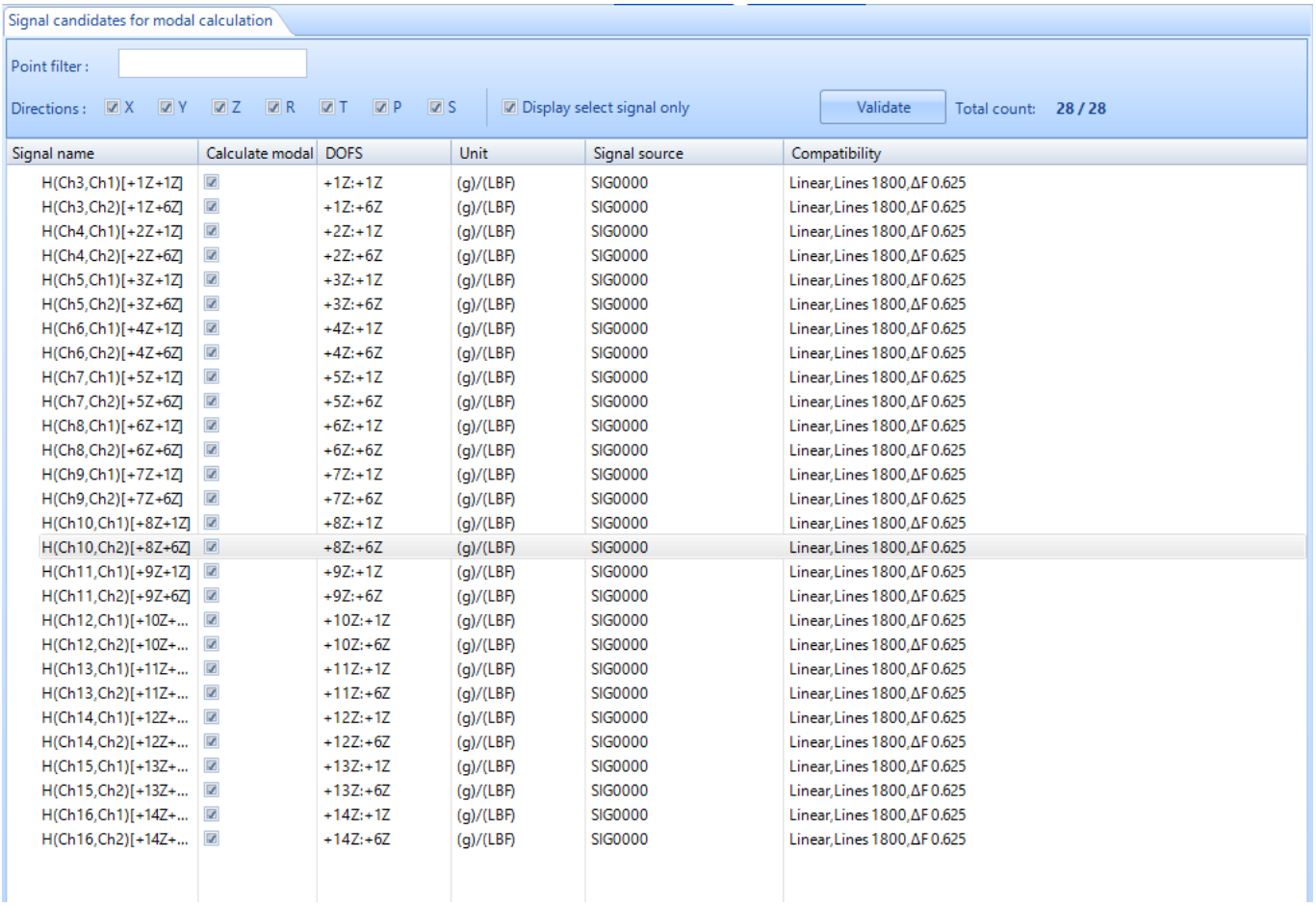
EMA Modal Data Selection

The **Modal Data Selection** tab is the first step of Modal Analysis in EDM. Here you choose which measured signals will be used to calculate the modal parameters, check that each signal has the correct Degree of Freedom (DOF) label, and confirm that all the signals are compatible before you move on to **Band Selection**.



The tab has two main areas:

Signal candidates table- lists every signal that has been added for modal calculation, along with its DOF, unit, and source file.

Chart- displays the signal for the row you have selected in the table.

Adding Signals

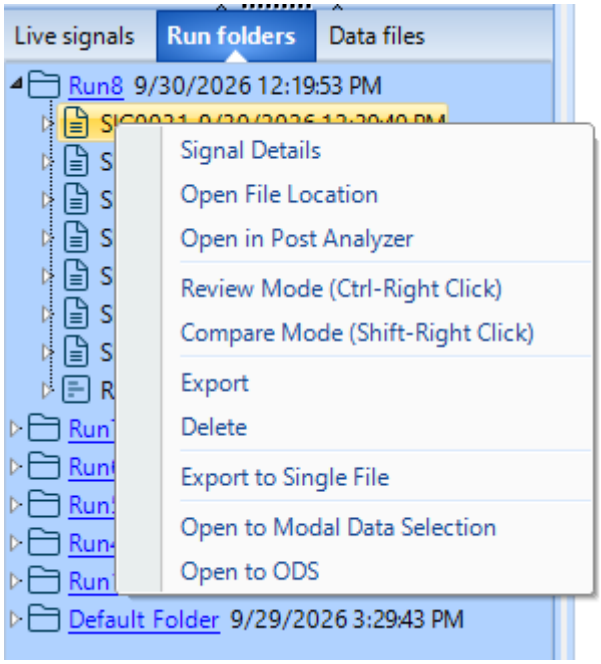
You can add signals to the Modal Data Selection table in several ways:

Automatically after a measurement- When a measurement is saved during an EMA test, its FRFs are added to the table automatically. If a new signal has the same name or DOF as a signal already in the table (for example, when you re-measure a point during a roving hammer test), the new signal replaces the old one.

Drag and drop- Drag saved signals from the signal tree (for example, from **Run Folders** or **Local Files**) and drop them onto the table. Only saved FRF signals can be dropped. Live signals cannot be used for modal calculation.

CoCo data- For Hammer Impact (CoCo) tests, right-click the signals uploaded from CoCo and choose the option to open them in Modal Data Selection.

Open to Modal Data Selection- Any Runs from the current test can be easily loaded into the page by right clicking on the save file under Run folders and selecting Open to Modal Data Selection in the right click menu. Separate data files can also be added once they are loaded under the similarly named tab



NOTE: Some rules apply when you add signals:

- EMA tests use FRF signals. Operational Modal Analysis (OMA) tests use cross-power spectrum signals only. Signals of the wrong type are skipped.
- If a signal with the same name is already in the table, EDM asks whether you want to overwrite it.
- All signals in the table must use the same DOF format. If the table uses `response:reference` DOFs (such as +2Z:-1Z), you cannot add a signal that has only a response DOF (such as +2Z), and the other way around.
- In an Import FRF test, if you add signals of a different type from the ones already in the table, EDM asks whether you want to clear the table first.

Signal Table

Each row in the table is one signal. The columns are:

Column	Description
Signal name	The name of the signal.

Column	Description
Calculate modal	Select this check box to include the signal in the modal calculation. Clear it to keep the signal in the list but leave it out of the calculation.
DOFS	The Degree of Freedom label of the signal. See DOF Format below. You can edit this cell.
Unit	The engineering unit of the signal.
Signal source	The name of the recording file that the signal came from.
Compatibility	Empty until you click **Validate**. Then it shows the frequency format, the number of lines, and the ΔF of each selected signal. See Validating Signals below.

Click a row to show that signal in the chart. If a geometry model is active, the response point of the signal is also highlighted on the model.

Total count- shows the number of signals selected for calculation and the number of signals shown in the table (for example, `12 / 15`).

Display select signal only- When this is selected, the chart shows only the signal in the selected row. When it is cleared, the chart can show more than one signal at the same time.

DOF Format

The DOF label tells EDM where each signal was measured. It uses the format `response point : reference point`, for example +2Z:-1Z.

- The number is the point number on the structure (2 and 1 in the example).
- The letter is the measurement direction (Z in the example).
- The sign (+ or -) is the orientation of the sensor along that direction.

In the example, +2Z:-1Z means the response was measured at point 2 in the +Z direction, and the reference (excitation) was at point 1 in the -Z direction. A DOF that has only a response point, such as +2Z, is also accepted.

DOF labels are created from the signal names. To change a DOF, click the **DOFS** cell of the row and type a new value. If the value is not in a valid format, EDM rejects it and keeps the old value.

NOTE: The hint at the bottom of the tab is a reminder of these rules: DOFs must use the `response point : reference point` format, and all selected signals must have the same block size and the same ΔF (Linear or Log).

Filtering the Table

Directions- Use the **X**, **Y**, **Z**, **R**, **T**, **P**, and **S** check boxes to show or hide signals by the direction of their response DOF. Signals in a cleared direction are hidden and are not used in the calculation.

Point filter- Type a point number and press **Enter** (or click outside the box) to show only the signals whose response point contains that number. Only digits are allowed. Leave the box empty to show all points.

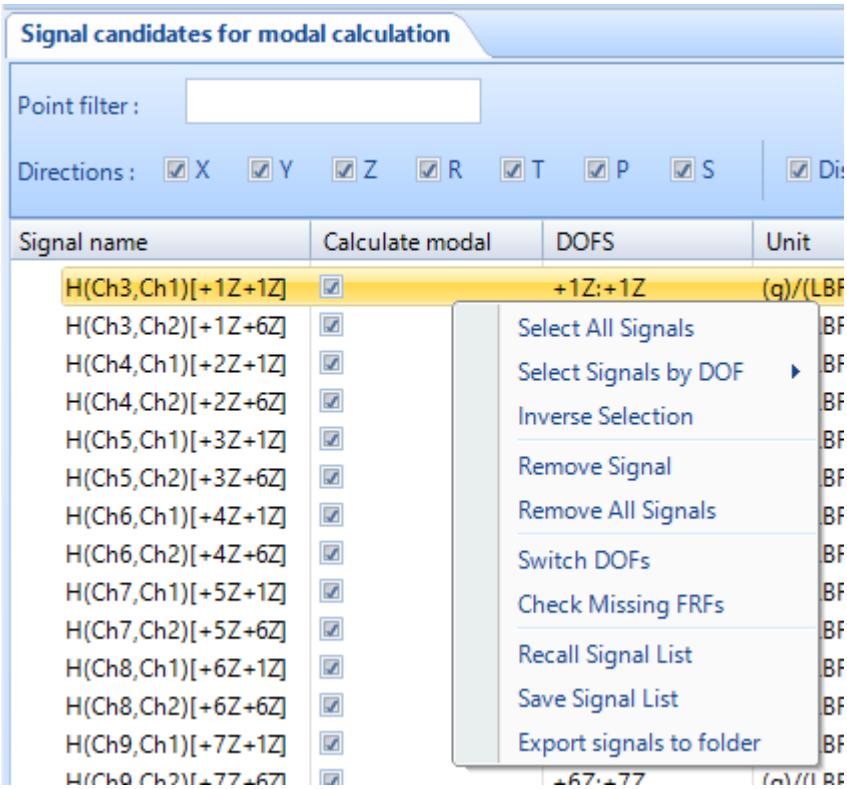
NOTE: The point filter matches any response point that *contains* the number you type. For example,

1 shows points 1, 10, 11, 21, and so on.

NOTE: When you change the direction check boxes or the point filter, **Calculate modal** is selected again for all the signals that are shown. Review your selections after you filter.

Right-Click Menu

Right-click anywhere in the table to open the menu.



Select All Signals- Selects **Calculate modal** for every signal in the table.

Select Signals by DOF- Opens a list of the reference DOFs in the table. Click a reference DOF to select or clear all the signals that use it. Click **Deselect All** to clear **Calculate modal** for every signal.

Inverse Selection- Selects the signals that are cleared and clears the signals that are selected.

Remove Signal- Removes the highlighted rows from the table. Hold **Ctrl** or **Shift** to highlight more than one row.

Remove All Signals- Removes every signal from the table.

Switch DOFs- Swaps the response and reference points for every signal (for example, +2Z:-1Z becomes -1Z:+2Z). This is useful when the signals were recorded with the response and reference reversed. This option is not available in MIMO FRF tests.

Check Missing FRFs- Compares the response points of the selected signals with the points in the geometry model and shows which points do not have an FRF yet.

Smooth Signal / Cancel Smooth- (OMA tests only) Smooths the selected signals in the chart, or removes the smoothing.

Recall Signal List- Opens a signal list (`.xml`) that was saved earlier. This replaces the signals that are in the table now.

Save Signal List- Saves the current table, including the DOFs and the **Calculate modal** selections, to an `.xml` file so that you can use it again later.

Export signals to folder- Copies the recording files (`.atfx` and their data files) of all the signals in the table to a folder that you choose. Use this to share a modal data set or to back it up.

Validating Signals

Before you continue to **Band Selection**, click **Validate** to check that the selected signals can be used together.

When you click **Validate**, EDM:

- Fills the **Compatibility** column with the frequency format (**Linear** or **Log**), the number of **Lines**, and the **ΔF** of each selected signal.
- Highlights in blue the signals that do not match the others, if the signals are not all the same, and shows the message *"Selected signals block size and ΔF must be the same"*.
- Checks for duplicate DOFs. If two selected signals have the same response point for the same reference, EDM shows the message *"Duplicate data found in the Dofs list"*.

For the modal calculation, all the selected signals must have:

- The same block size (number of lines).
- The same ΔF.
- The same frequency format (all Linear or all Log).
- A different response DOF for each reference DOF.

To fix a problem, clear **Calculate modal** for the highlighted signals, remove them, or edit the DOFs that are duplicated. Then click **Validate** again.

NOTE: For multiple-reference (MIMO) data, EDM shows a warning if the number of response DOFs is less than the highest reference point number. You can still continue, but some modal results may not be calculated.

NOTE: If you change the signal selection after you have worked in **Band Selection**, the Band Selection and the Stability Diagram are cleared, and you must do them again.

FAQs

Why can't I drop a signal into the table?- Only saved FRF signals can be used (cross-power spectra for OMA tests). Live signals and other signal types are not accepted. Save the measurement first, then add it from **Run Folders** or **Local Files**.

Why did my signal list get shorter after I added signals?- A new signal replaces an existing signal that has the same name or the same DOF. This is how a re-measured point replaces the old measurement in a roving test.

Why does Validate highlight some of my signals?- The highlighted signals have a different block size, ΔF, or frequency format from the rest. All the signals in one modal calculation must be measured with the same analysis parameters.

Why is a signal missing from the table?- Check the **Directions** check boxes and the **Point filter**. Signals that do not match the filters are hidden.

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