Poly2SCN Interface

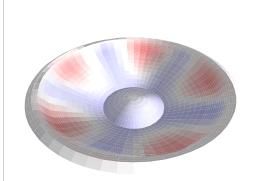
Software of the KLIPPEL Analyzer SYSTEM (Document Revision 1.0)

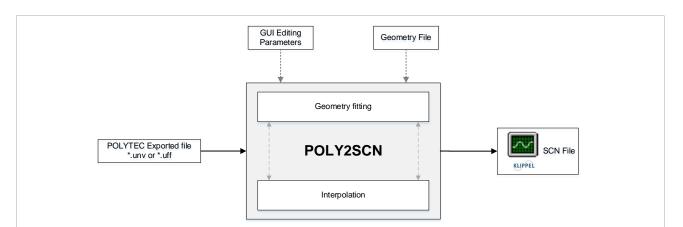
FEATURES

- Merges 2D or 3D vibration-geometry data from Polytec scanning systems to the Klippel SCN Software
- Easy to use GUI for vibration and geometry data interpolation and optimal fitting

FEATURES

• Take full advantage of the SCN Software features using external vibration measurement systems.





Poly2SCN loads an exported *.unv or *.uff file measured with *PSV* series *Scanning Vibrometer* systems (also with 3D geometry from *PSV Geometry Scan Unit*) and generates a synthetized grid in which the vibration data is interpolated. The geometry and the parameters of the grid can be edited to reach an optimal fitting. The Poly2SCN interface provides a *.sce file compatible with the SCN software.

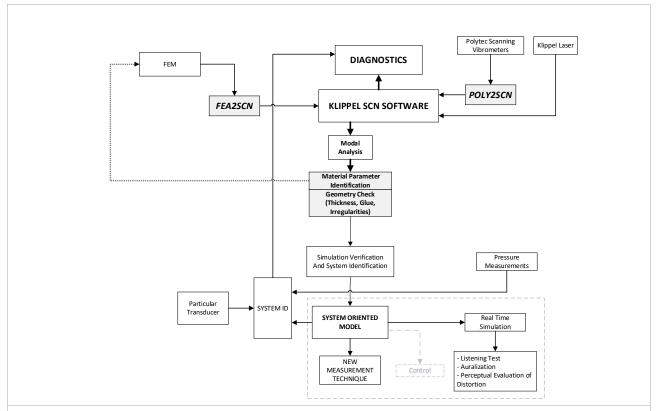
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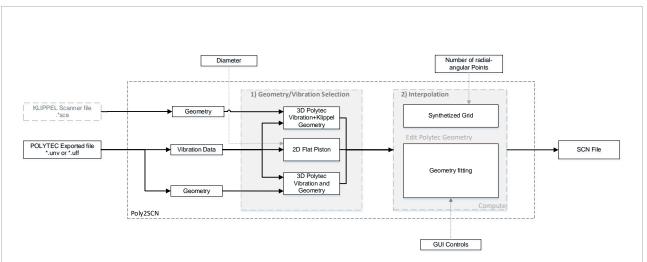
Poly2SCN Interface 1 General Overview \$45

1 General Overview



Finite Element Analysis (FEA) and other vibration modelling techniques, require accurate material parameters such as the Young's modulus and the loss factor in function of frequency. In order to generate accurate dynamic simulations, the material parameters should be measured with high accuracy. Experimental and numerical modal analysis performed to the measured and simulated transducer are the basis for the fitting of the numerical model to reality. Using the *Poly2SCN* and *FEA2SCN* modules in combination with new parameter identification techniques, the material parameters of different components of the transducer can be measured and the simulations can be verified and validated. Valuable information for diagnostics can be collected during this process.

2 Functionality of the interface



Vibration data measured with Polytec Scanner Vibrometers can be imported fast and easily into the Klippel SCN Software using the Poly2SCN Interface. Arbitrary measurement grids generated in the Polytec scanning process can be edited and interpolated over an optimized grid for a suitable post processing in the Klippel Scanner Software.

The output Klippel Scanner file *.ksp containing the vibration data measured with a Polytec system and mapped over a desired geometry, can be generated by the following two simple steps: 1) Loading an exported Polytec *.uff/.unv file and selecting the desired geometry option, 2) setting the geometry parameters to get the best matching between the Polytec points and the synthetized grid.

Poly2SCN supports Exported Polytec files containing 2D or 3D geometry data. By loading this file, the interface will automatically enable the *Geometry/Vibration Selection* options compatible with the measured file and the user can choose the more convenient for the study. The three possible modes are described here:

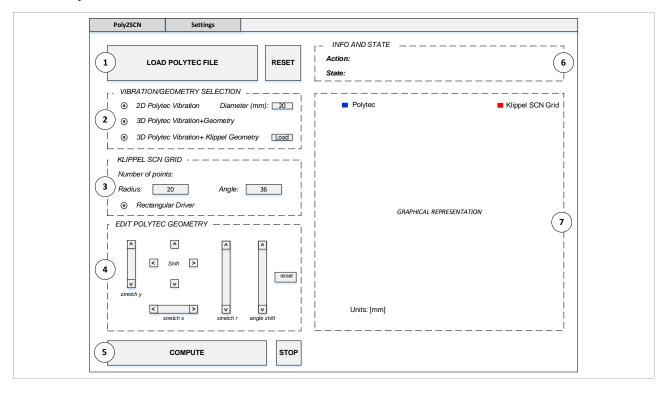
- **3D Polytec Vibration + Klippel Geometry**: This mode can be used with any kind of Polytec data and projects the Vibration points onto a Geometry measured with the displacement sensor of the Klippel Scanner software. (**Note:** This mode requires a Klippel file containing the geometry).
- **2D Flat Piston:** This mode projects the vibration data over a flat synthetized grid. This mode is useful if no geometry information is available for the driver. In the case of a Polytec file containing only 2D geometry data, the diameter of the transducer is required.
- **3D Polytec Vibration and Geometry:** This mode is available when geometry data is provided in the exported file. It will map the Vibration and geometry points onto an optimized synthetized grid.

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In some cases the measured data can contain some errors (distortion of the geometry caused by a non-perfect perpendicular location of the laser sensor with respect to the driver surface, shifting, etc...), that can be fixed by editing the geometry parameters to get a best mapping over the synthetized grid.

2.1 Input		
Input Data	Vibration and [optional] geometry measurement data from Polytec (1)	*.unv/.uff Exported file. Contains the vibration and geometry data. (<i>This file should contain only Velocity/Voltage Transfer function or Linear Velocity Response</i>). The information contained in this file enables the different options for the data/geometry available in the interface.
	[Optional] Klippel Scanner file (2)	*.sce File Exported from Klippel Scanner software containing driver geometry. To be specified only when 3D Polytec Vibration + Klippel Geometry mode is selected.
	Vibration/Geometry selection (2)	Three modes that can be used depending on the desired analysis to be performed and the availability of the data in the Polytec file. The vibration data can be mapped over a Klippel geometry, a flat piston or the geometry measured with a Polytec system.
Input Variables	Synth. Grid radius/angle resolution	Determines the number of radial/angular points to be exported in the output file.
	Diameter (2)	Diameter of the measured driver. To be specified only when <i>2D Polytec Vibration</i> mode is selected.
	Geometry shift and stretching (4)	Parameters to edit the geometry of the Polytec points allowing an optimal matching of the over the Synthetized grid.

3 Graphical user interface



4 Results

4.1 Result Data

Export file

The interface will generate the *.ksp Klippel Scanner Project file, the *.sce and *.bin files to be opened with the Klippel SCN Software in the same directory where the *Exported Polytec file* is located.

Folder: Polytec File folder\Data_Base_NAME\POLY2SCN_results

Files: Operation_NAME.sce and Operation_NAME.bin

To open the file in the SCN Software Click on the Open File option in the window opened when the export process is finished.

Please refer to C5 Scanner Vibrometer Specification for more information.

5 File format Poly2SCN Interface

File format

5.1 Input file

Polytec File

The interface needs universal file formats such us: *.unv or *.uff for the Polytec vibration data. So it is important to export the Polytec scan as .unv or .uff data.

The structure of this data is built in data blocks. The first block includes the measurement points of the loudspeaker scan. After that there is one vibration data block for each point. It is preferred that the vibration data is exported as transfer function Voltage/Velocity.

Polytec exported *.unv - *.uff File Structure

An example of the input file can be seen bellow:

```
Dataset 151 - General Header of Universal file
151
2014_06_07_80mm_Breitbänder_PSV500.svd
PSV Version 9.0.3.4
07-Jun-14 14:08:17
None None
PolyUFFExport 2.8.2.0 - Kompatibel zu SDRC
28-Jun-14 10:42:12
  -1
                                                     Dataset 164 - Units
   1METRIC_ABS_(SI)
                         2
 1.000000000000000E+00 1.0000000000000E+00 1.0000000000000E+00
0.000000000000000E+00
  -1
                                   Dataset 2411 - GEOMETRY (Nodes)
2411
 \hbox{-}6.9534004433080554e\hbox{-}04 \quad 5.1605958491563797e\hbox{-}02 \quad \hbox{-}2.7718034107238054e\hbox{-}03
 2.4228331167250872e \hbox{-} 03 \quad 5.1549099385738373e \hbox{-} 02 \quad \hbox{-} 4.5772365410812199e \hbox{-} 04
              1
                  11
 2.4048734921962023e-03 4.8623610287904739e-02 -2.9360331245698035e-04
        1 1 11
 -5.8508937945589423e-04 4.8657890409231186e-02 -1.0229870676994324e-03
2.5152680464088917e-03 4.5695748180150986e-02 1.5698620118200779e-03
                                    Dataset 58 – Vibration Data Data
Response Linear Spectrum
Vib Geschwindigkeit
07-Jun-14 14:08:17
2014_06_07_80mm_Breitbänder_PSV500.svd
NONE
                                                 ---- Point Number
 12 3 1 0 NONE 1 3 NONE 1 3
5 3198 1 1.87500e+01 6.25000e+00 0.00000e+00
   18 0 0 0 Frequency
                                   Hz
   11 0 0 0 Velocity
                                  m/s
    0 0 0 0
                     NONE
                                  NONE
    0 0 0 0 NONE
                                  NONE
-1.42804e-05 6.30821e-06 -1.34890e-05 1.47361e-05 6.36574e-05 4.53256e-05
 4.01105e-05 -2.31319e-04 -9.40181e-05 -7.43785e-05 -8.81755e-05 -3.92700e-05
 -9.49083e-05 -7.32225e-06 -1.14765e-04 1.66893e-05 -1.52490e-04 1.12681e-04
                                                          Frequency 3
      Frequency 1
                                 Freauencv 2
     Real & Imaginary Real & Imaginary Real & Imaginary
```

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	<i>Important Note:</i> The Dataset 58 of the universal file may contain different kinds of measured data, like displacement, velocity acceleration or even energetic measures of those quantities; make sure that in the exporting process the data exported is Velocity or Transfer function Velocity/Voltage.
Klippel File	The geometry data measured with the Klippel SCN software must to be exported as ASCII file (*.sce). In this file there is a matrix "geometry" which includes the whole geometry information. Please refer to C5 Scanning Vibrometer Specification for more information.

Find explanations for symbols at:

http://www.klippel.de/know-how/literature.html

Last updated: 1.6.2017

