# VIBES.technology

Improving sound & vibration engineering

DIRAC

High-quality FRF models using the virtual point transformation, compatible with CAE

A NEW WAY OF MEASURING WITH **DIRAC**

DIRAC allows engineers to acurately measure Virtual Point transformed FRFs and NTFs. These can be combined with simulated FRFs, to make reliable full-vehicle models available earlier in the development process. DIRAC ensures traceability of results and indicates the quality of the measurement. DIRAC includes checks for outstanding model quality: from the Measurement Preparation with DoF contribution insights, Signal Checks, classical FRF checks (passivity, coherence), up to checks on the resulting model. Overall, DIRAC helps to avoid the final-phase troubleshooting – which can postpone vehicle production – and reduces the number of prototype variants needed, thus saving valuable time and resources.


Accelerometer →
Virtual Point →

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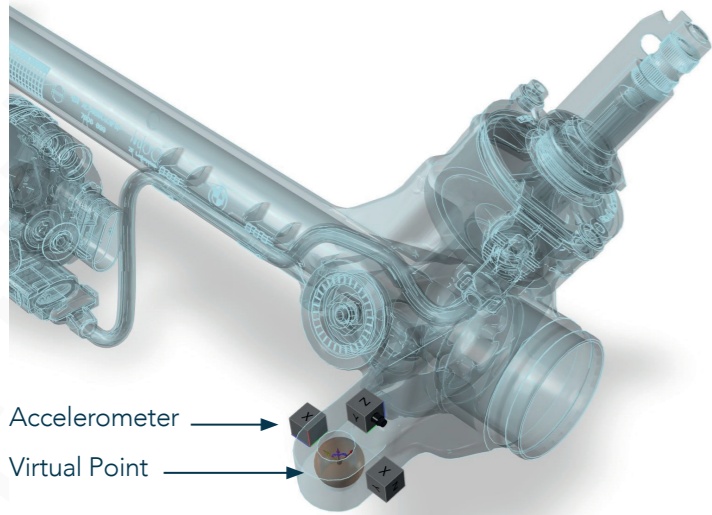
With the live quality indicators in DIRAC, you will get the right results on the first try.

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EXAMPLES

RUBBER CHARACTERIZATION - MODULAR NVH ENGINEERING

Rubber bushings and other types of mounts can be characterized up to several kHz using inverse substructuring or full decoupling. DIRAC guides you through the entire measurement process and provides translational and rotational dynamic stiffnesses in the virtual points.
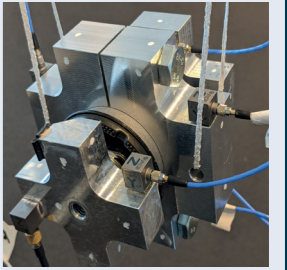

VEHICLE FRF/NTF MEASUREMENT - EXTREMELY HIGH QUALITY
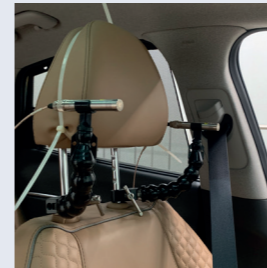
DIRAC measures noise transfer functions at the highest accuracy for a frequency range from 0 to over 5 kHz, supporting multiple impact hammers, force consistency functions and exports to ATFX and MAT-files.

TEST BENCH MEASUREMENTS WITH VIRTUAL POINT FOR TPA

DIRAC has unique possibilities for measuring two-sided and one-sided virtual point FRFs. These are key to successful blocked-force source characterization and transferability from test bench into a (substructured) vehicle.
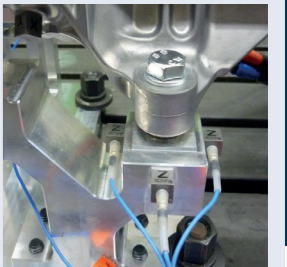
WORKFLOW **DIRAC**

PREPARE

Design of experiment
- Place sensors and impacts in 3D environment
- Define virtual points for compatibility with FE models
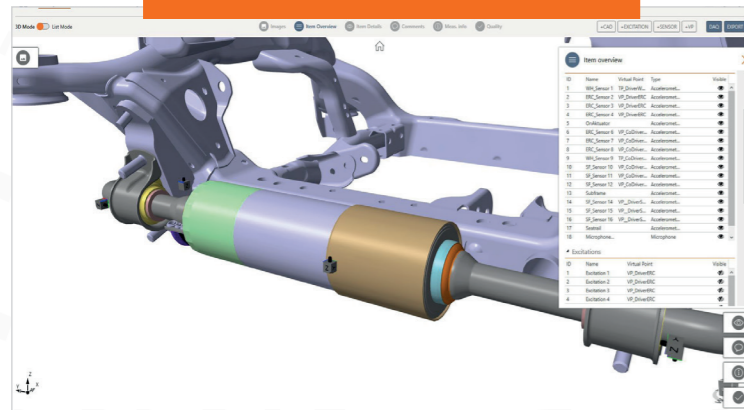- Add photos to document and crosscheck your setup in DIRAC

Align all involved parties
- DIRAC is used to define goals, design the experiment and inform measurement execution.
- Consistent way of describing measurements for an efficient modular R&D process

High quality FRF testing
- Guided testing workflow
- Merging multiple impact hammers
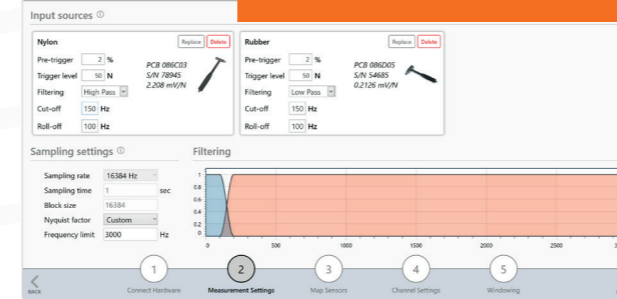
ANALYZE

Matrix overviews
- All data in a single overview
- Choose between classic FRF coherence & magnitude and Virtual Point quality indicators

Quality indicators
- Virtual Point consistencies, reciprocity and passivity
- 3D mode shape animations

File formats
- Measurement setup (XLSX)
- FRF results (ATFX, UFF)
- Mode shapes (GIF)
- All-containing export (MATLAB)

Import of CAD geometry
- Support for popular CAD formats
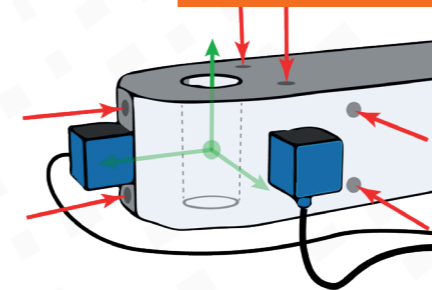- High-performant 3D experience

MEASURE

Connect or import
- Measure live using your Müller-BBM MKII DAQ
- Import data from any other DAQ using ATFX

Real-time insights
- DIRAC helps spotting and fixing measurement errors
- Full flexibility to add impacts & change settings on the fly

Virtual Point Transformation
- Unique in the market
- Rotational degrees of freedom
- True 6-DoF 'super-element' FRFs compatible with FE models

EXPORT

Time-saving integration for further analysis
- VIBES' **SOURCE** for Blocked Forces and TPA
- **VIBES Toolbox for MATLAB** for Dynamic Substructuring

DID **DIRAC** MAKE AN IMPACT?
GET IN TOUCH FOR **A DEMO**

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