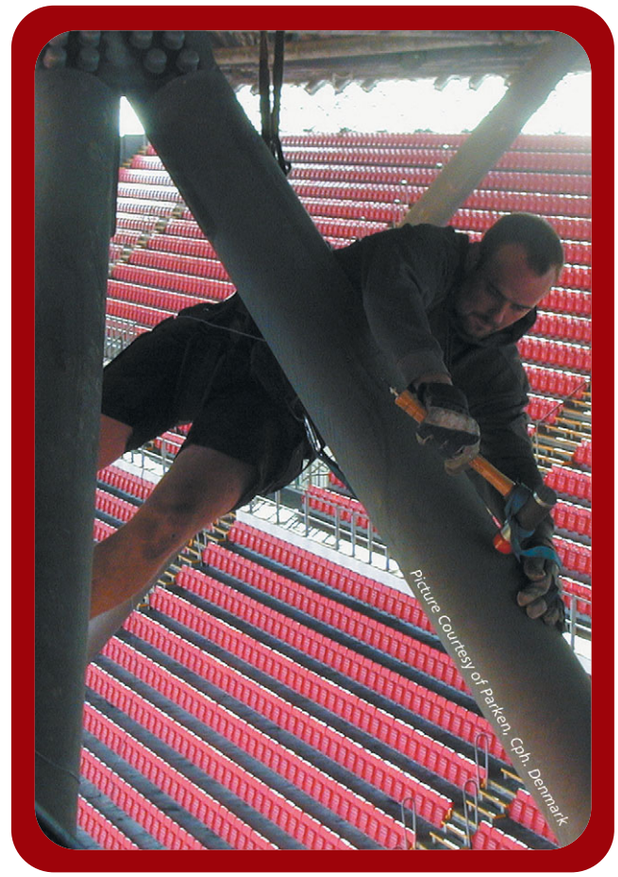
MODAL ANALYSIS

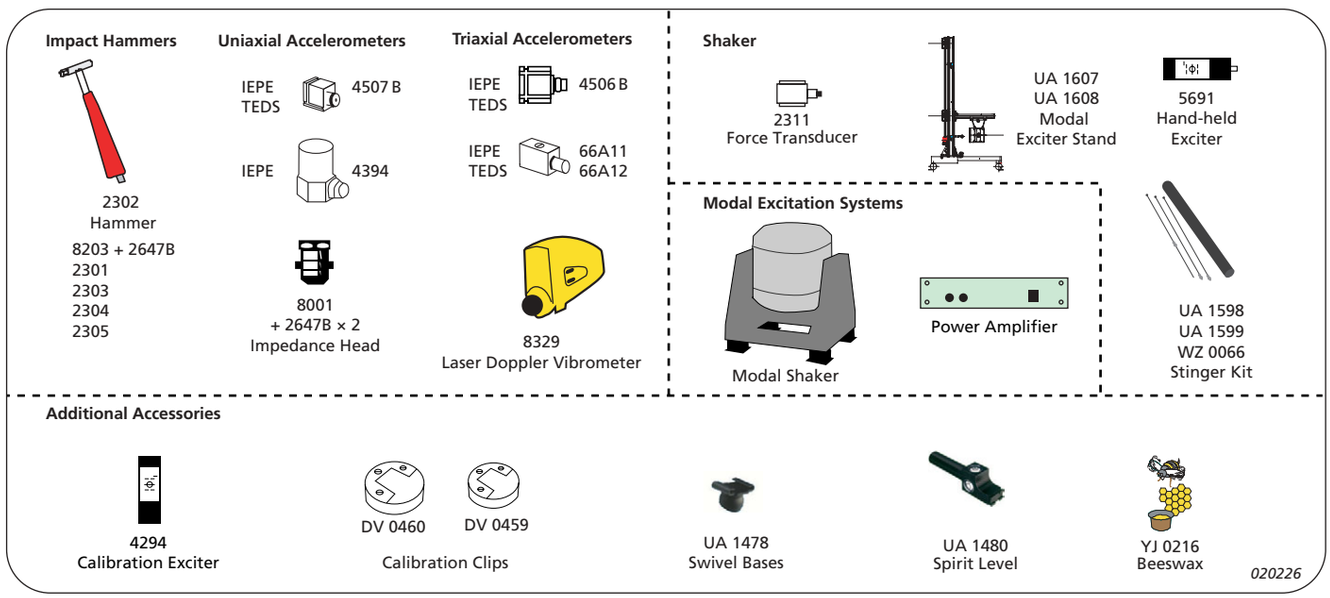
It is vital to understand a structure's (machine, vehicle, building, etc.) vibrations and their underlying causes to either prevent future problems or solve existing problems. Modal analysis is an efficient tool for describing, understanding and modelling structural behaviour.

Modal analysis is used for:

- Troubleshooting
- Refinement and validation of analytical Finite Element Models (FEM)
- Structural dynamic modifications
- Structural assembly analysis

Modal testing ranges from a simple mobility test with an impact hammer to multi-shaker testing of large structures with hundreds of response accelerometers. The Brüel & Kjær PULSE Modal Solution is expandable and can grow with the user's requirements.





HARDWARE ACCESSORIES

UA 1407, UA 1408	Set of 100 Mounting Clips
UA 1563, UA 1564	Set of 5 High Temp. Mounting Clips
UA 1077	Set of 5 Mounting Magnets, M3
UA 0642	Set of 5 Mounting Magnets, 10/32
UA 1473, UA 1478	Set of 100 Swivel Bases
UA 1480	Spirit Level Set
UA 1216	Set of 10 Insulation Studs, M3–M3
UA 1215	Set of 10 Insulation Studs, 10/32–10/32
WA 0224	Set of 5 Insulating Mechanical Filters, M3–M3
UA 0553	Set of 5 Insulating Mechanical Filters, 0/32–10/32
YJ 0216	Beeswax

SW UPGRADING ACCESSORIES

7707	Unlimited Analysis Engine
7760n	Operational Modal Analysis
BZ 5457	Upgrade MTC to ODS TC
7764	PULSE MIMO Analysis
7754n	Upgrade to ME'scope™ SDM
7767	PULSE Data Manager
7755B	PULSE Bridge to MATLAB®

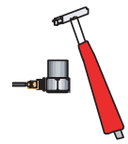
TYPE 3560 C-S31

Modal Analysis – Single Reference (2 In)

3560 C
7533
3109
7770-N2
7753
7754 I

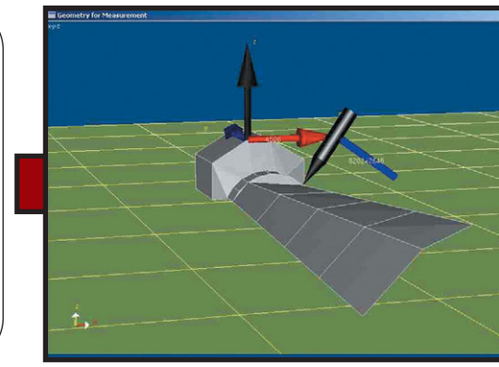
For determining resonance frequency, damping, and mode shape by impact testing.

- Modal Test Consultant guides the novice step-by-step through the procedure for gathering modal data
- All the software needed to gather and analyse modal data using the popular single reference technique



* One year SW maintenance

PULSE Modal Test Consultant effortlessly handles real-world local coordinate systems. Geometry information is integrated with data



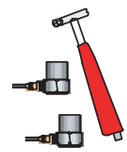
TYPE 3560 C-S32

Modal Analysis – Multiple Reference (4 In)

3560 C
7533
3109
7770-N4
7753
7754 J

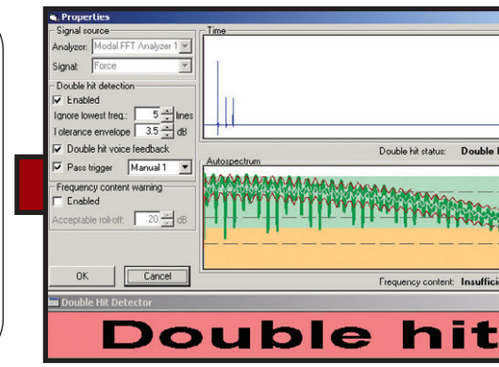
For testing structures with repeated, closely spaced, or poorly coupled modes.

- Includes modal software for multi-reference curve fitting of complex structures
- Multiple impact systems can be "stacked" to create larger channel-count system for shaker or operational deflection shape testing



* One year SW maintenance

PULSE Modal Test Consultant can automatically detect and reject double impacts. A real time-saver that improves impact data quality



HAMMER GUIDE

TYPE	DESCRIPTION	APPLICATION
2301 or 8203	Mini Hammers	Hard-drives, circuit boards, turbine blades
2302-10	General Purpose, 0.3 lb	Small to medium sized objects
5961	Hand-held Exciter	Small to medium sized objects
2303	1 lb Hammer	Car frames and machine tools
2304	3 lb Hand Sledge	Large shafts and larger machine tools
2305	12 lb Sledge	Small building and small bridges
(7760)	Operational Modal Analysis	Large structures or systems with unmeasurable forces

MINIATURE IMPACT TESTING SYSTEM

3560 C-S21	Basic Impact Testing, 2 channels
8203	Miniature Impact Hammer
2647 B	In-line Charge Amplifier
8329	Single-point Laser

GENERAL PURPOSE IMPACT TESTING SYSTEM

3560 C-S21	Basic Impact Testing, 2 channels
2302-10	General Purpose Impact Hammer
4507 B-001	Accelerometer

MULTIPLE REFERENCE IMPACT TESTING (MRIT) SYSTEM

3560 C-S22	Basic Impact Testing, 2 channels
2302-10	General Purpose Impact Hammer
3 × 4507 B-001	Accelerometer

TYPE 3560 D-S13

Modal Analysis – Single Reference (16 In)

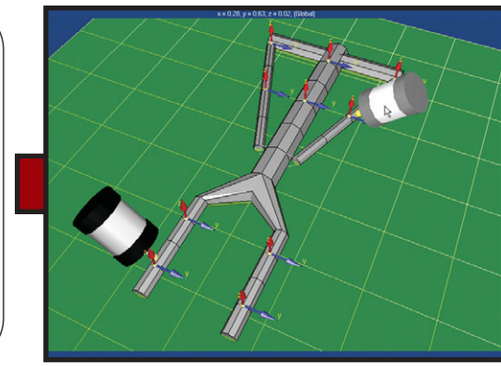
3560 D
7536
3109
2 × 3032 A
7770-N16
7753
7754 I

* One year SW maintenance

For faster testing of structures with multiple modifications or non-linearities.

- Modal Test Consultant graphically sets up shaker signals and recommends the proper analysis to use with each shaker signal

Many large and complex structures benefit from MIMO testing. PULSE seamlessly handles multiple shaker testing



TYPE 3560 D-S14

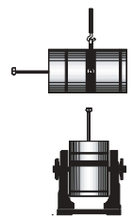
Modal Analysis – Multiple Reference (16 In)

3560 D
7536
3109
2 × 3032 A
7770-N16
7753
7764
7754 J

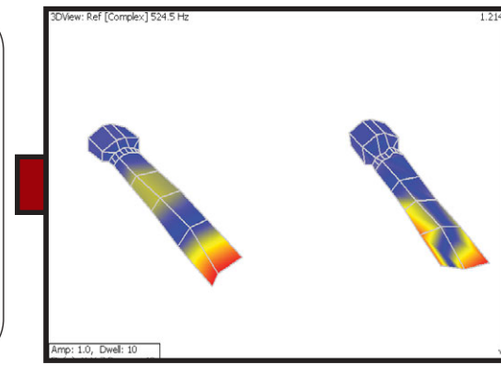
* One year SW maintenance

For accurate testing of complex structures using multiple shakers.

- Includes software to calculate Multiple-Input Multiple-Output (MIMO), FRF, Multiple Coherence, and performs multiple-reference curve fitting



ME'scope™ flexibly compares mode and ODS shapes. Animations are easily exported as AVI for presentation



TYPE 3560 E-S6

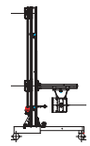
Modal Analysis – Multiple Reference (92 In)

2 × 3560 E
2 × 7536
2 × 3109
14 × 3032 A
7770-N16
7753
7764
7754 J

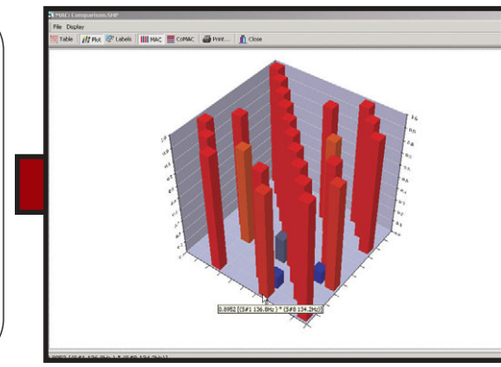
* One year SW maintenance

For modal testing on medium to large structures.

- Up to 4 simultaneous shakers for large or complex structures
- Advanced features for multichannel testing, e.g., integrated TEDS, modular cabling and hardware setup tables



Built-in MAC tables compare results from different tests and from analytical Finite Element Analysis (FEA)



16 CHANNEL SHAKER SYSTEM

3560 D-S14	Basic Shaker, 16 channel
2311-100	ISOTRON® Force Sensor
3624	Modal Excitation System
5 × 4506 B-002	1 V/g Triax. Accelerometer
5 × AO 0534	5 m Triax. cable

ADVANCED SHAKER SYSTEM

3560 E-S4	Advanced Shaker, 92 channels
3 × 2311-100	ISOTRON® Force Sensor
3 × 3624	Modal Excitation System
UA 1607	Lateral Modal Exciter Stand

29 × 4506 B-002	1 V/g Triax. Accelerometer
14 × AO 0537	10 m² Triax. to 3032 B Input Module Cable

MODAL EXCITER SYSTEMS

4810 + 2718	10 N Miniature Shaker
3624	100 N System
3625	200 N System
3626	400 N System
3627	650 N System
3628	1000 N System