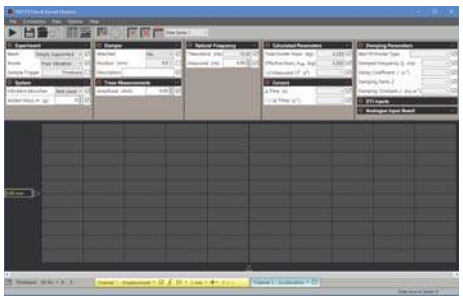
FREE AND FORCED VIBRATIONS

VDAS® TM1016

Investigates the free and forced vibrations of a rigid beam with a spring, and a simply supported beam. Demonstrates Rayleigh's approximation and Dunkerley's method.



SCREENSHOT OF THE VDAS® SOFTWARE

FEATURES:		BENEFITS:
Two different vibration systems in one self-contained unit: a 'rigid' beam with a spring and a pinned-pinned (simply supported) 'flexible' beam	→	Increased experimental scope with minimal set up time
Non-contacting displacement sensor	→	Frictionless measurement of displacement – minimises influence on experiment results
High-quality servomotor 'exciter' – for forced vibrations at a constant speed	→	Minimises cyclical variations – enhances accuracy and repeatability
Offset mass position sensor	→	Demonstrates the phase relationship between applied force and displacement
Built-in accelerometer for comparison of derived and measured acceleration waveforms	→	High level functions deepen students' understanding
Works with TecQuipment's VDAS® for real-time display of the vibrations	→	Advanced software eliminates need for additional expensive oscilloscope

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LEARNING OUTCOMES:

- Free and forced vibrations of a rigid beam and spring
- Free and forced vibrations of a flexible pinned–pinned (simply supported) beam
- Using Rayleigh's approximation to predict vibration frequency
- Frequency of oscillation and varying mass
- Finding the 'beam only' frequency using Dunkerley's method
- Phase difference between displacement, its derivatives and measured acceleration
- Damped free and forced oscillations and damping coefficient
- Phase relationship between the applied force and beam position for different damping values
- Demonstration of a two-degree of freedom (2DoF) system
- Demonstration of an undamped vibration absorber

A bench-top unit to demonstrate free and forced vibrations of two mass-beam systems:

1. A 'rigid' beam with a pivot at one end and a spring at the other – the spring provides the elasticity.
2. A 'flexible' pinned-pinned beam with a pivot at one end and a roller pivot at the other – the beam itself provides the elasticity.

ESSENTIAL ANCILLARIES:

- Versatile Data Acquisition System – bench-mounted version (VDAS-B) 299

NOTE: This equipment needs the latest VDAS® and will not work with early versions of VDAS®. Contact TecQuipment or the local agent if unsure.

ALTERNATIVE PRODUCTS:

- Free Vibrations of a Mass-Spring System (TM164) 234
- Free Vibrations of a Cantilever (TM166) 236
- Free Vibrations of a Beam and Spring (TM167) 237

SHOWN CONNECTED TO VDAS®