GEARED SYSTEMS

VDAS® TM1018

A set of products for dynamic and static experiments on geared and other drive systems.

FEATURES:		BENEFITS:
Fully equipped bench-mounted base unit for tests on several different drive units	→	Saves space and reduces costs
Includes gear drive unit, with optional belt, chain and helical gear drive systems	→	Offers comparative tests of different designs
Optional test stand (TM1018a)	→	For additional tests in static efficiency and inertia
Easy set-up – all drive units can be removed and fitted in minutes	→	Maximises experiment time
Works with VDAS®	→	Quick and reliable tests with data capture

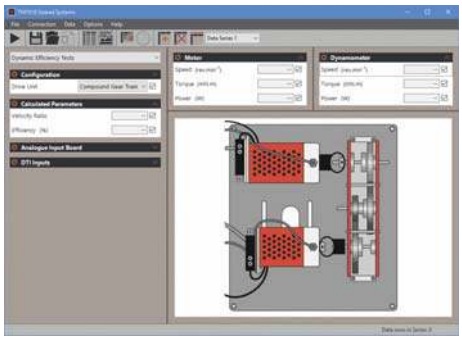
LEARNING OUTCOMES:

DYNAMIC:

- Simple and compound gear trains
- Mechanical advantage, velocity ratio and dynamic efficiencies of gear trains
- Mechanical advantage, velocity ratio and dynamic efficiencies of optional drive systems (chain, belt and helical gears)
- Appreciation of the different characteristics of drive systems
- Chain and belt drive tension, including different methods of application

ACCELERATION AND STATIC:

- Mechanical advantage, velocity ratio and static efficiencies of gear drives
- Mass moment of inertia of a flywheel by experiment and calculation
- Mass moment of inertia of geared drive systems by experiment and calculation



SCREENSHOT OF THE OPTIONAL VDAS® SOFTWARE

In the base unit's upper level, the student fits their choice of drive unit. A variable-speed, low-voltage motor provides the shaft input turning force (effort) to the drive. A dynamometer provides the output braking force (load) to the drive. The dynamometer uses electromagnetic braking and a hysteresis effect to provide a variable load at a constant torque, irrespective of the speed. Sensors on the motor and dynamometer measure their shaft speed, torque and therefore power in and out at the drive. Fans provide air cooling for both the motor and dynamometer. Flexible couplings with collets connect the drive unit to the motor and dynamometer for quick and accurate alignment.

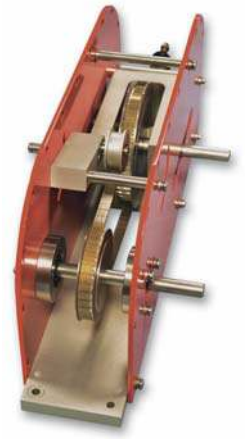
OPTIONAL TEST STAND TM1018A

The Acceleration and Static Test Stand (TM1018a) gives extra experiments in measuring angular acceleration and static efficiency.

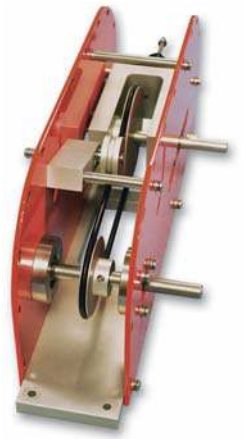
OPTIONAL DRIVE UNITS

TOOTHED BELT DRIVE TM1018B
ROUND BELT DRIVE TM1018C
CHAIN DRIVE TM1018D
HELICAL GEAR DRIVE TM1018E

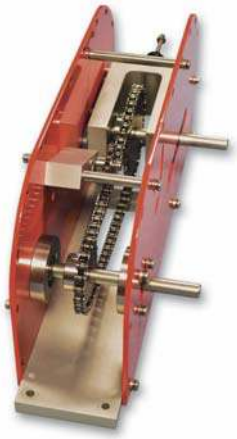
The optional drive units work with the TM1018 base unit for dynamic tests on performance, allowing comparison with the gear drive. For extended experiments, the optional drives each include three different methods of adjusting their tension to demonstrate how this affects performance.



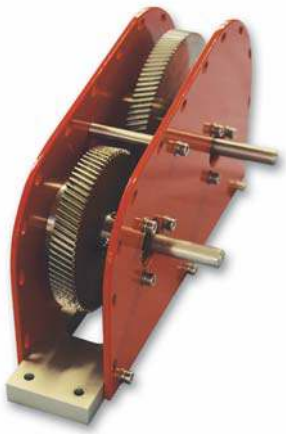
TOOTHED BELT DRIVE
TM1018B



ROUND BELT DRIVE
TM1018C



CHAIN DRIVE
TM1018D



HELICAL GEAR DRIVE
TM1018E

RECOMMENDED ANCILLARIES:

- Acceleration and Static Test Stand (TM1018a) 223
- Toothed Belt Drive (TM1018b) 223
- Round Belt Drive (TM1018c) 223
- Chain Drive (TM1018d) 223
- Helical Gear Drive (TM1018e) 223
- Versatile Data Acquisition System – Bench-mounted version (VDAS-B) 299

ALTERNATIVE PRODUCTS:

- Drive Systems Kit (ES11) 20
- Gear Trains Kit (ES13) 21
- Potential and Kinetic Energy Kit (ES9) (for the optional test stand TM1018a) 17