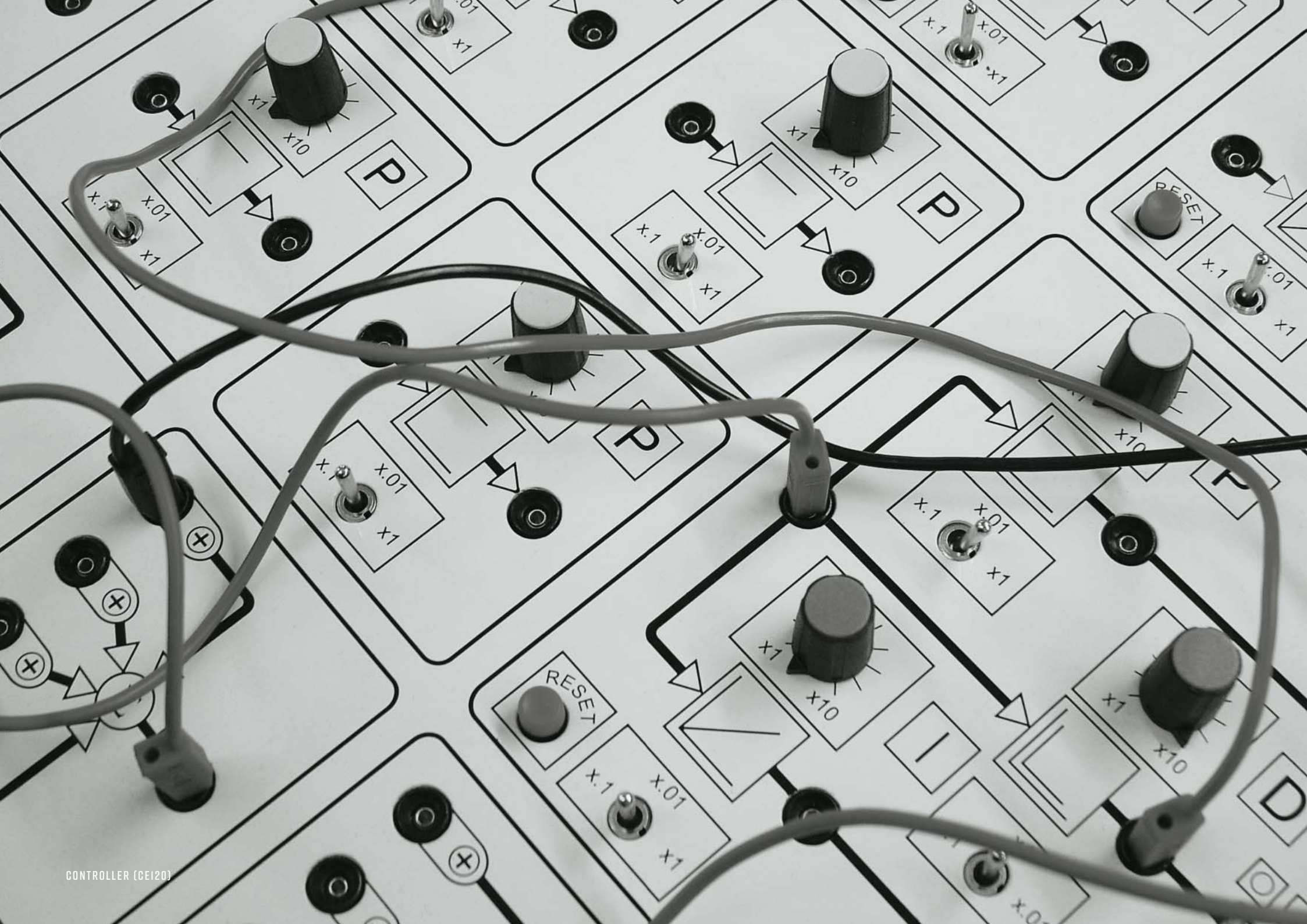
FIVE YEAR QUALITY TECQUIPMENT SINCE 1958 WARRANTY

TECQUIPMENT ACADEMIA

60 TECQUIPMENT 1958 2018 YEARS OF SUPERIOR QUALITY

ENGINEERING EXCELLENCE IN EDUCATION



CONTROLLER (CEI20)

INSPIRING FUTURE ENGINEERS

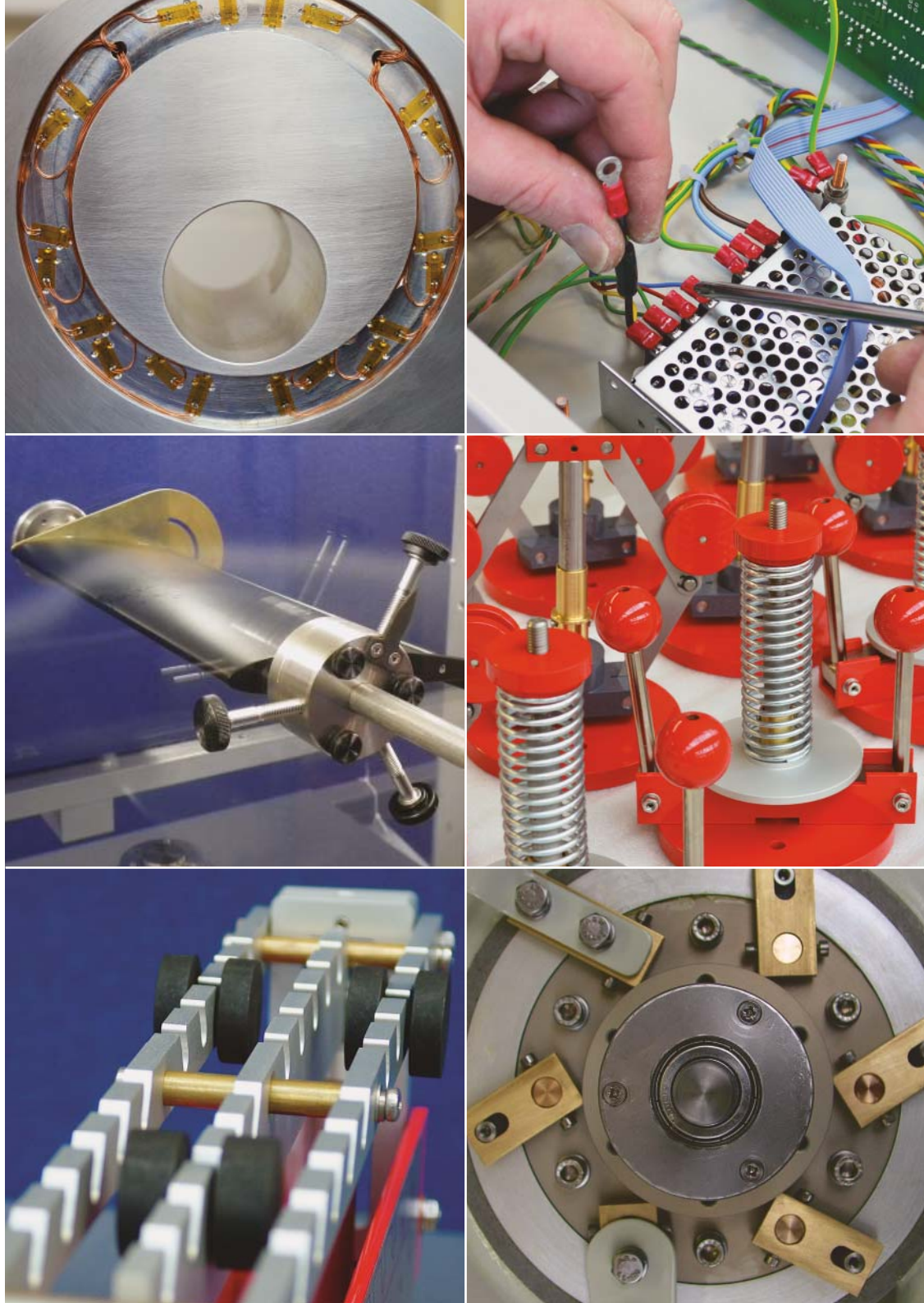
Since 1958, TecQuipment has been dedicated to developing products that inspire students at universities, colleges, schools and training centres in over 100 countries.

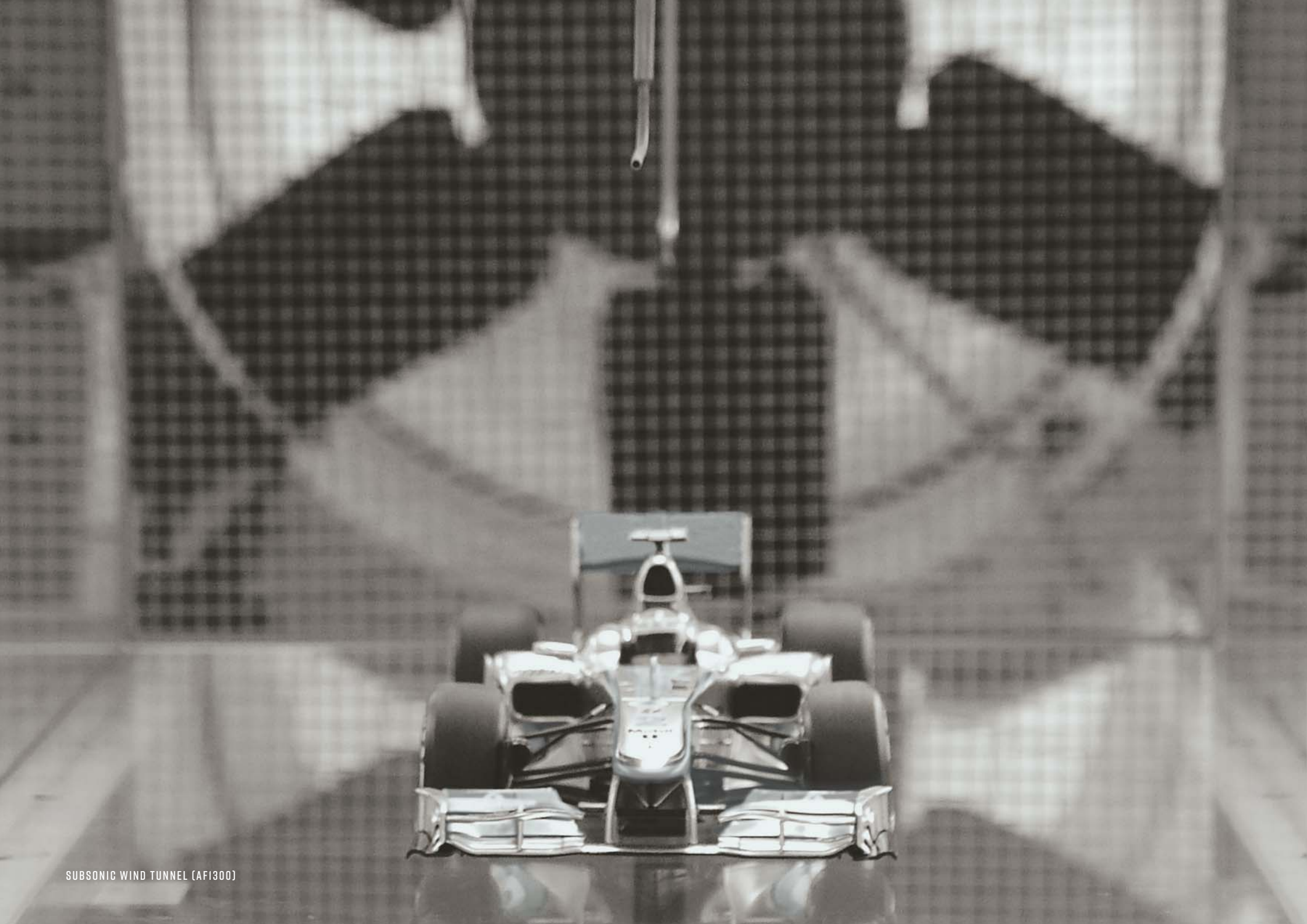
Our equipment helps students understand key concepts in many fields of engineering and science, including aerodynamics, fluid mechanics, thermodynamics, materials testing, plus many more. TecQuipment's products include detailed manuals and instructional materials that are specifically designed to aid instructors to provide students with the facilities to grasp the key concepts of engineering.

Comprehensive intuitive design and thorough safety features, students are able to get hands-on with complex systems that will spark a passion for engineering and build knowledge of the relevant topics.

The quality of our products is central throughout our design processes and manufacturing, which gives us the confidence to offer a five-year warranty on all of our equipment. This five-year warranty is reinforced by a dedicated team of specialists at TecQuipment with lifetime support when you purchase our products.

FIVE YEAR QUALITY TECQUIPMENT SINCE 1958 WARRANTY





SUBSONIC WIND TUNNEL (AF1300)

AERODYNAMICS

TecQuipment's Aerodynamics range has equipment to cover all your curricula needs, from introductory level with our Modular Air Flow Bench to the complex Supersonic Wind Tunnel.

MADE FOR EDUCATION AND TRAINING

As with all our products, we make the Aerodynamics range for use in teaching and training environments. It may be used for research projects or teaching from first principles to advanced ideas. The equipment is small enough to fit in most laboratories, while still producing results that you can scale to match those of full-size wind tunnels. The subsonic and special-purpose wind tunnels are mobile to help with laboratory layouts.

SUBSONIC WIND TUNNEL (AF1300)

MODULAR AIR FLOW BENCH (AF10)

KEY EXPERIMENTS:

- Bernoulli's equation
- Drag force
- Study of air flow at subsonic and supersonic speeds
- Fixed wing aircraft performance

KEY FEATURES AND BENEFITS

MADE FOR TEACHING: Realistic results yet small enough for laboratories.

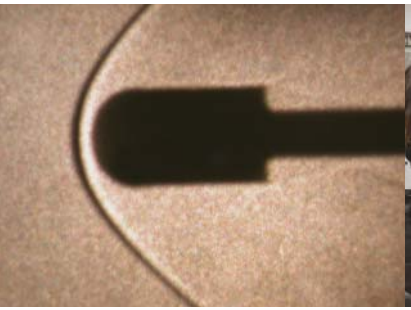
FLEXIBILITY: Packages of equipment can be chosen to suit budgets and needs.

EASY SET-UP: It takes only minutes to change and set up an experiment.

HANDS-ON: Laboratory-scale parts allow easy fitting and adjustments, for a more practical understanding.

AUTOMATIC DATA ACQUISITION VDAS®

Most of the products in this range work with TecQuipment's Versatile Data Acquisition System (VDAS®).



CONTROL ENGINEERING

KEY FEATURES AND BENEFITS

ACADEMIC AND INDUSTRIAL: Bench-top products for academic teaching and industrial products for vocational training.

CHOICE: Start with a single control scenario and build up, or choose a more complete product to suit your budget and needs.

SAFE AND EASY SET-UP: Simple, low-voltage connections allow safe and quick experiments.

HANDS-ON: Both the academic and industrial products allow easy connection and adjustments, for a more practical understanding.

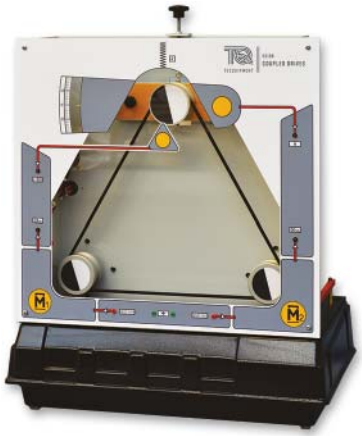
Each unit in the Control Engineering range focuses on a specific principle. This gives students the opportunity to develop a deep understanding of each concept, naturally progressing from introductory to advanced experimentation.

The majority of the apparatus in the Control range can be connected to TecQuipment's dedicated Controllers (CE120 and CE122). The units have clear diagrams, highlighting each of the PID elements, for simple analogue or digital execution of the experiments.

ENGINE SPEED CONTROL APPARATUS (CE107)

POWERFUL SOFTWARE

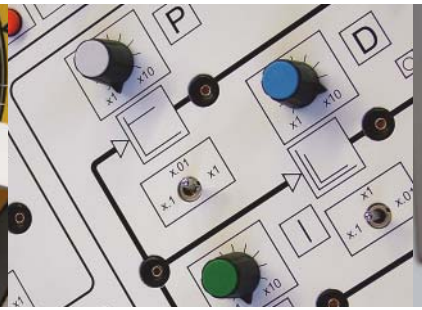
All our Control Engineering products work with software. Most of the academic products work with TecQuipment's own CE2000 control software.

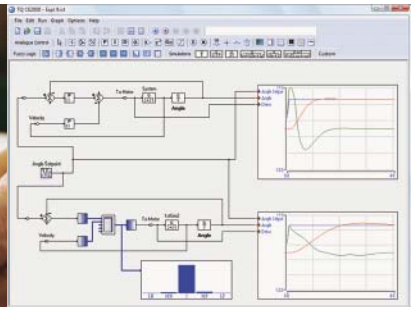


COUPLED DRIVES (CE108)

KEY EXPERIMENTS:

- Principles of control engineering, including engine speed, temperature, flow, pressure and level





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PROCESS CONTROL ENGINEERING

The Process Control Engineering range extends from bench-top products made for demonstrating control principles, to equipment using industrial parts for vocational training.

ACADEMIC AND INDUSTRIAL SOFTWARE

All our Process Control products work with software. The academic products work with TecQuipment's own CE2000 control software. The more industrial products work with industrial process or PLC software.

PLC PROCESS (CE111)

FLOW/PROCESS TRAINING SYSTEM (TE3300/03)

KEY EXPERIMENTS:

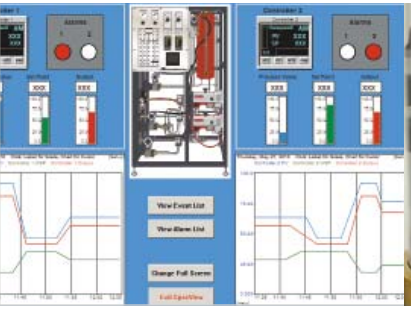
- Programmable logic control
- Ladder logic operations
- Timers, counters and monitoring
- Proportional, integral and derivative (PID) control
- Level, pressure, flow and temperature control

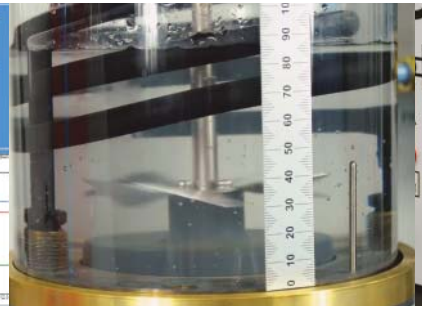
KEY FEATURES AND BENEFITS

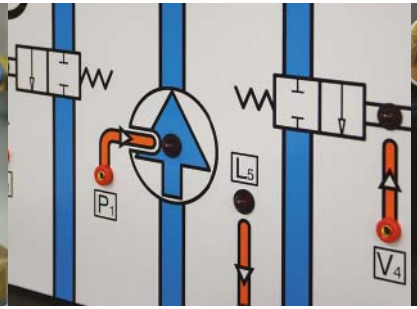
ACADEMIC AND INDUSTRIAL: Bench-top products for academic teaching and industrial products for vocational training.

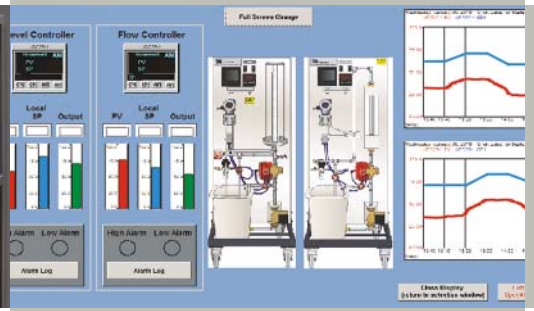
HANDS ON: All the products allow easy connection and adjustments, for a more practical understanding of principles.

INDUSTRIAL COMPONENTS: Realistic student experience, with the use of industry-standard instrumentation.









ENGINEERING SCIENCE

TecQuipment's Engineering Science range opens up the world of mechanical engineering to everyone. The range provides affordable, hands-on learning that gives students the underlying theories of mechanical engineering and entices them to further education on the topics.

This is a modular system based around a robust, re-usable work panel onto which students set up and perform their experiments. This means as much or as little as required can be ordered and a comprehensive system can be built up over a period of time.

KEY EXPERIMENTS:

- Materials testing
- Pulleys, cams and gears
- Forces, moments and vibration
- Friction
- Simple machines

FORCES KIT (ES2)

STORAGE UNIT (EST)
WITH EXPERIMENT KITS

KEY FEATURES AND BENEFITS

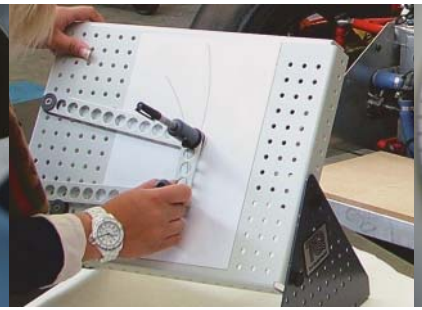
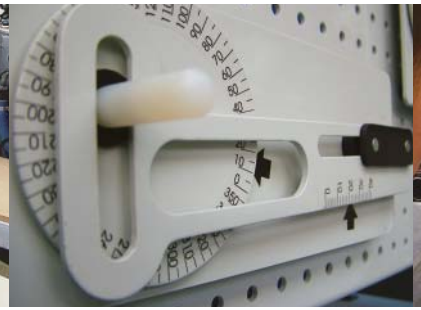
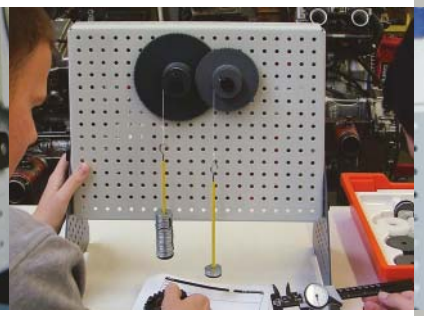
VALUE: Each kit can perform a number of different experiments.

BROAD RANGE OF TOPICS: From materials testing and vibration to simple machines and friction.

HANDS-ON LEARNING: Highly tactile, easy-to-use components, together with pre-prepared worksheets, allow students to work alone or with minimal supervision.

MODULAR AND COST EFFECTIVE: Select just the kits you need, or buy the whole set.

NO STORAGE PROBLEMS: Supplied in their own robust trays with optional mobile storage unit.


FLUID MECHANICS

KEY FEATURES AND BENEFITS

LONGEVITY: Long-lasting equipment to teach principles that do not go out of date.

WATER AND SPACE SAVING: Many experiments work with the self-contained, mobile hydraulic bench to save water and laboratory space.

LARGE CHOICE OF EXPERIMENTS: A huge range of experiments for a complete course in fluid mechanics, from simple flow and pressure measurements to advanced studies of vortices and open-channel flow.

MODULAR FLUID POWER RANGE

The Fluid Mechanics range includes a sub-section of Modular Fluid Power products to demonstrate real-world applications of fluid mechanics. They include pumps and turbines, which also provide a link to renewable energy.

Our huge Fluid Mechanics range includes apparatus covering basic concepts and measuring techniques through to products suitable for research projects. TecQuipment's water flumes, coupled with their associated ancillaries, can be used for a vast range of open channel experiments. The range spans small flumes suitable for occasional use to large laboratory models.

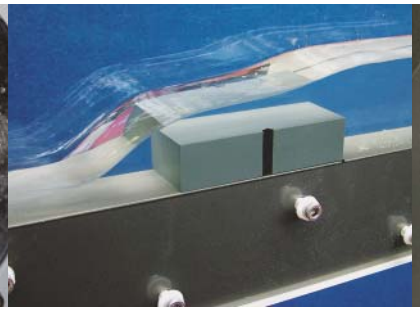
FLOW AND SEDIMENT TRANSPORT CHANNEL (FC80-2.5)

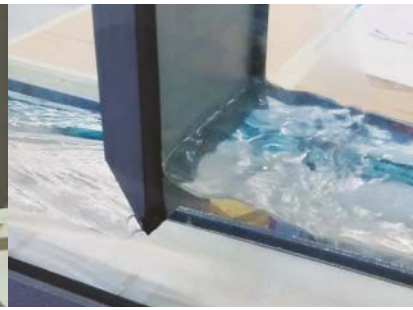
VORTEX APPARATUS (H13) AND DIGITAL HYDRAULIC BENCH (H1F)

KEY EXPERIMENTS:

- Flow and pressure measurement
- Pipe friction and energy loss
- Laminar and turbulent flow
- Nozzles, jets, vortices and cavitation
- Flow visualisation
- Pipe surge and water hammer
- Flow channels
- Hydrostatics and properties of fluids
- Hydrology
- Pumps and turbines







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MATERIALS TESTING

TecQuipment has decades of experience making products that test materials specimens, refining and developing them over time to match the needs of modern engineering courses. These high-quality, robust products are made for the teaching laboratory, giving the long-term performance and reliability needed for accurate and dependable results.

BROAD AND PROGRESSIVE RANGE

Experiments from the most basic theoretical level such as Hooke's law and Young's modulus, to the more advanced but ever popular destructive tests that can be achieved on equipment such as our Universal Testing Machine. TecQuipment offers a broad range of equipment to demonstrate the principles of bending, creep, tension and toughness.

BENCH-TOP TENSILE TESTING MACHINE (SM1002)

STRAIN GAUGE TRAINER (SM1009)

KEY EXPERIMENTS:

- Basic elastic properties
- Stress and strain analysis
- Torsion, fatigue, creep, tensile, hardness and impact testing
- Bending of unsymmetrical cantilevers
- Deflection and forces on beams
- Loading and buckling of struts

KEY FEATURES AND BENEFITS

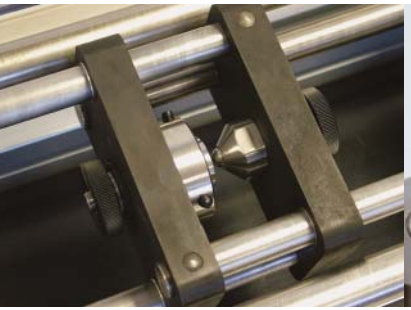
REFINED PRODUCTS: Meets the needs of a modern materials course.

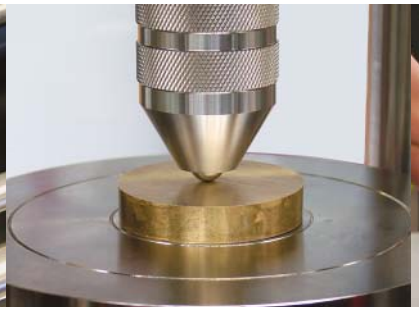
BROAD AND PROGRESSIVE RANGE OF EXPERIMENTS: Teaches the fundamental principles, progressing to complex stress and strain analysis.

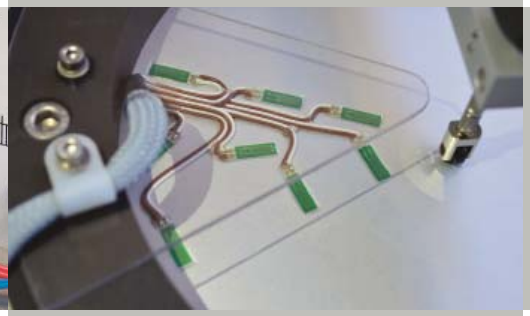
AUTOMATIC DATA ACQUISITION: Multiple and fast-changing measurements make data acquisition a valuable tool.

AUTOMATIC DATA ACQUISITION VDAS®

Most of the products in this range work with TecQuipment's Versatile Data Acquisition System (VDAS®).







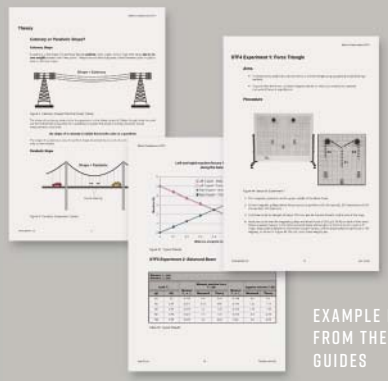
STATICS FUNDAMENTALS

KEY FEATURES AND BENEFITS

FLEXIBILITY: Share one work panel between experiment kits, or one work panel for each kit.

HANDS-ON: Large tactile parts for students to fit and adjust.

HIGHLY VISUAL: For classroom demonstrations or groups of students.



EXAMPLE PAGES FROM THE USER GUIDES

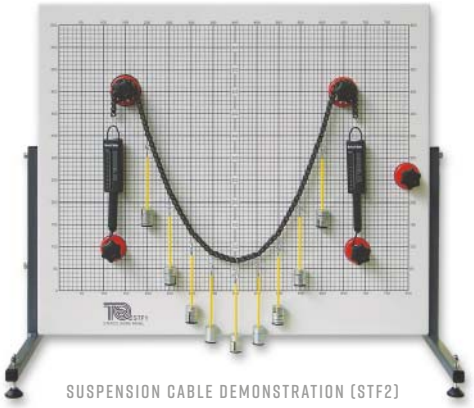
This highly visual range of products is modular to provide customers with the flexibility to tailor our products around their respective curricula. This range covers a vast array of the topics relating to static equilibrium and is the perfect introduction to support our Structures range which provides more advanced theories on the subject.

VISUAL AND HANDS-ON

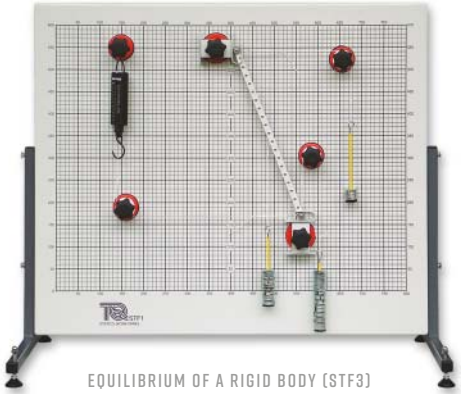
The Statics Fundamentals products continue TecQuipment's core value of creating 'hands-on' equipment. Students or teachers assemble and adjust the parts for highly visual and tactile experiments.

KEY EXPERIMENTS:

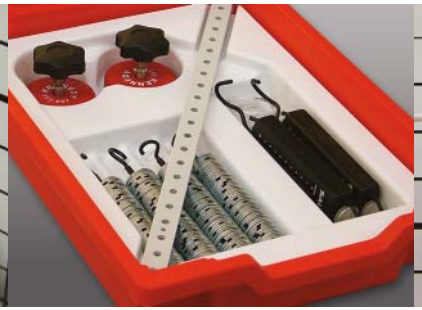
- Suspension cable demonstration
- Equilibrium of a rigid body
- Equilibrium of forces
- Equilibrium of a beam

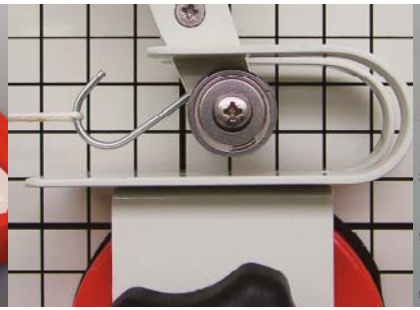


SUSPENSION CABLE DEMONSTRATION (STF2)



EQUILIBRIUM OF A RIGID BODY (STF3)





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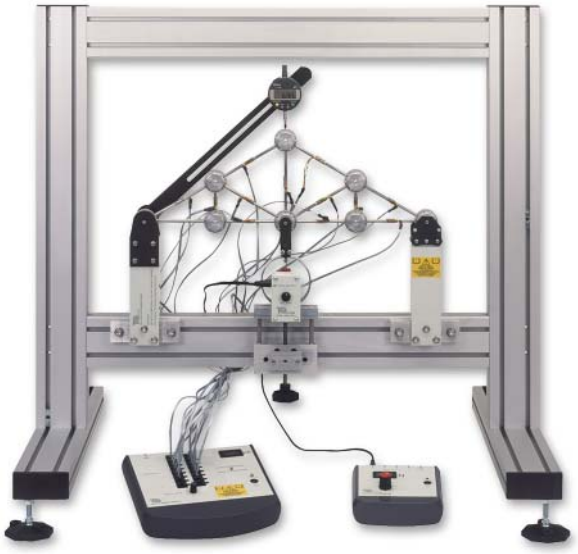
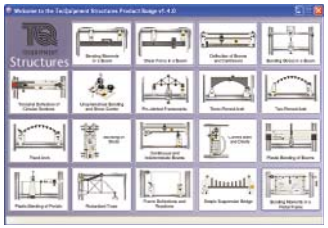
STRUCTURES

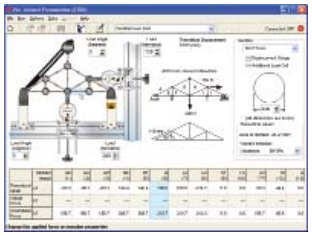
TecQuipment's modular Structures range offers a cost-effective, flexible teaching system that we believe is the most advanced product in its field.

The range teaches basic principles to more advanced theory. It has 19 desk-mounting hardware experiment modules supported by full automatic data acquisition, and TecQuipment's powerful and popular Structures Software.



PIN-JOINTED FRAMEWORKS (STR8)





STRUCTURES SOFTWARE (STRS)

KEY EXPERIMENTS:

- Bending moments in a beam
- Shear force in a beam
- Deflection of beams and cantilevers
- Plastic bending of portals
- Three-pinned arch
- Two-pinned arch
- Buckling of struts

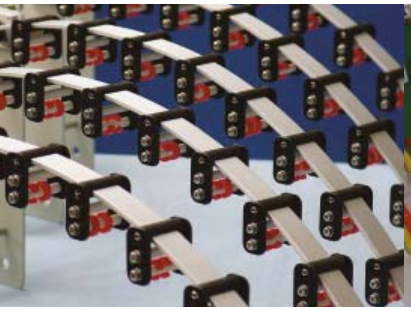
and many more...

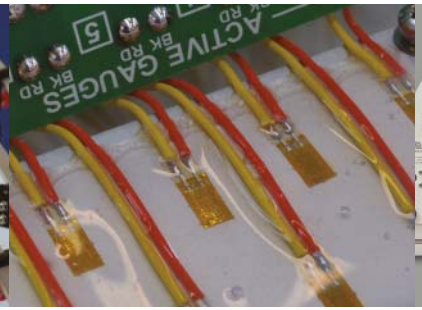
KEY FEATURES AND BENEFITS

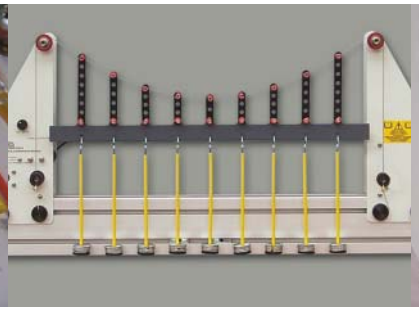
FUNCTIONALITY: High-quality design and manufacture, combined with modularity, extensive capabilities, choice of hardware and software, means our Structures range provides an unsurpassed teaching solution at an unbeatable price.

EXPANSIVE: The Structures Software provides virtual experiments, which allow students to complete experiments beyond the limits of the equipment.

FLEXIBLE: Experiments are easily removed and swapped for another, making sensible use of laboratory space and time.







GEARS FROM THE BENCH-TOP TENSILE TESTING MACHINE (SM1002)

THEORY OF MACHINES

An understanding of how machines work is fundamental to the vast majority of engineering courses and provides students with knowledge that will serve them throughout their entire academic and future careers.

BASIC AND ADVANCED

The constantly expanding Theory of Machines range includes equipment that teaches the basics of machine engineering such as vibration and motion, to more advanced studies of friction in bearings.

CAM ANALYSIS MACHINE (TM1021)

FREE AND FORCED VIBRATIONS (TM1016)

KEY EXPERIMENTS:

- Performance and pressure distribution around a gas lubricated bearing
- Hertz's theories of contact between materials
- Pressures around a journal bearing
- Cams and followers and their 'bounce' speed
- Geared systems
- Static and dynamic balancing
- Gyroscopes and centrifugal force
- Free and forced Vibrations

KEY FEATURES AND BENEFITS

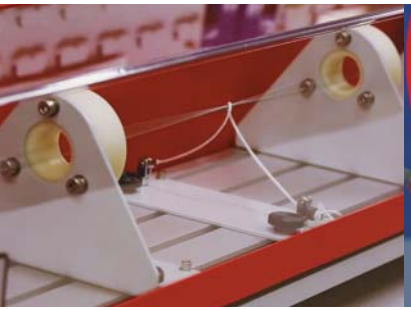
BASIC TO ADVANCED TEACHING: To suit all your laboratory needs.

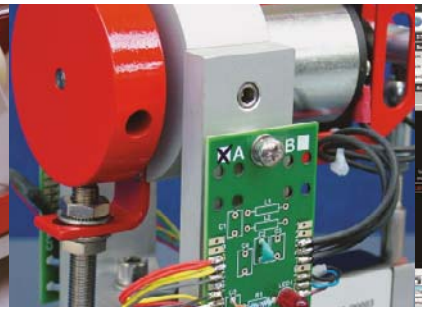
SAFETY BY DESIGN: Interlocked guards where required prevent accidents.

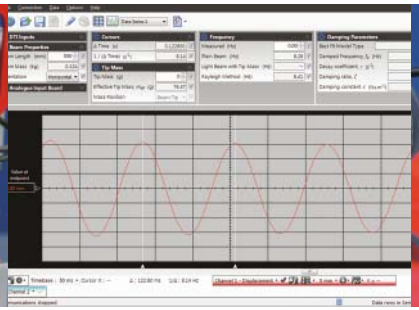
AUTOMATIC DATA ACQUISITION: Fast moving equipment often requires multiple fast measurements, making data acquisition a powerful tool.

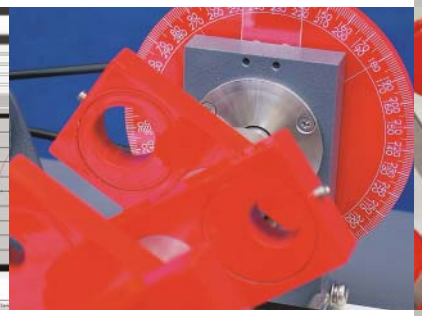
AUTOMATIC DATA ACQUISITION VDAS®

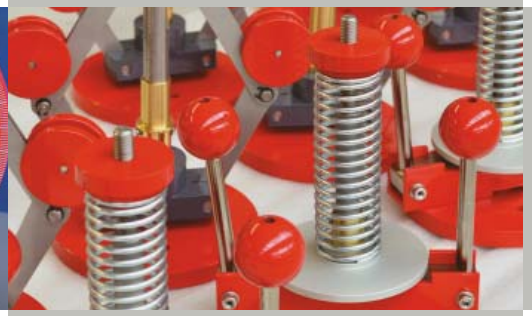
Most of the products in this range work with TecQuipment's Versatile Data Acquisition System (VDAS®).











THERMODYNAMICS

Guided by educational experts and students, TecQuipment has developed and expanded this range to include an extensive selection of high-quality robust products. Our experience has shown that thermodynamics experiments can take many hours, so our designs reduce the experiment time to a practical and realistic level, with safety as the key aspect.

MODULAR FLUID POWER

Our Modular Fluid Power range includes products that can be analysed in terms of thermodynamic performance, such as compressors.

IDEAL GASES – BOYLE'S LAW (TD1000)

KEY EXPERIMENTS:

- Boyle's law and Gay-Lussac's law
- Heat transfer
- Peltier and Seebeck tests
- Temperature, humidity and steam
- Single and two-stage compressors

WATER-TO-AIR HEAT EXCHANGERS (TD1007) AND OPTIONAL 16-TUBE AND FINNED HEAT EXCHANGERS

KEY FEATURES AND BENEFITS

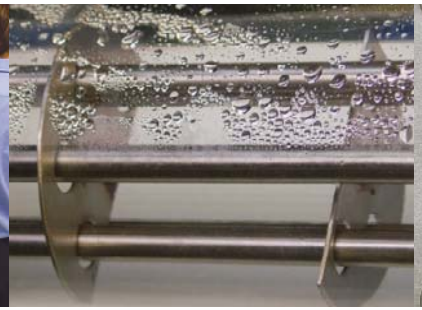
SAFE AND PRACTICAL DESIGN: Reduced experiment times.

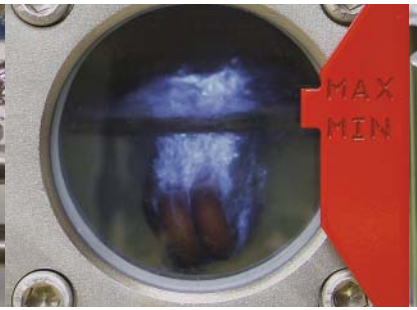
BROAD RANGE OF PRODUCTS: Covers from basic principles to gas turbines.

AUTOMATIC DATA ACQUISITION: Thermodynamics experiments need several minutes of constant monitoring to achieve thermal equilibrium, making automatic data acquisition a useful tool.

AUTOMATIC DATA ACQUISITION VDAS®

Most of the products in this range work with TecQuipment's Versatile Data Acquisition System (VDAS®).





SMALL ENGINE TEST SET (TB200)

ENGINES

All of the products in the Engines range work with specialist software for detailed data acquisition and engine cycle analysis. The different software options are designed specifically for each unit and provide a powerful tool for students' understanding of complex principles.

WIDE RANGE

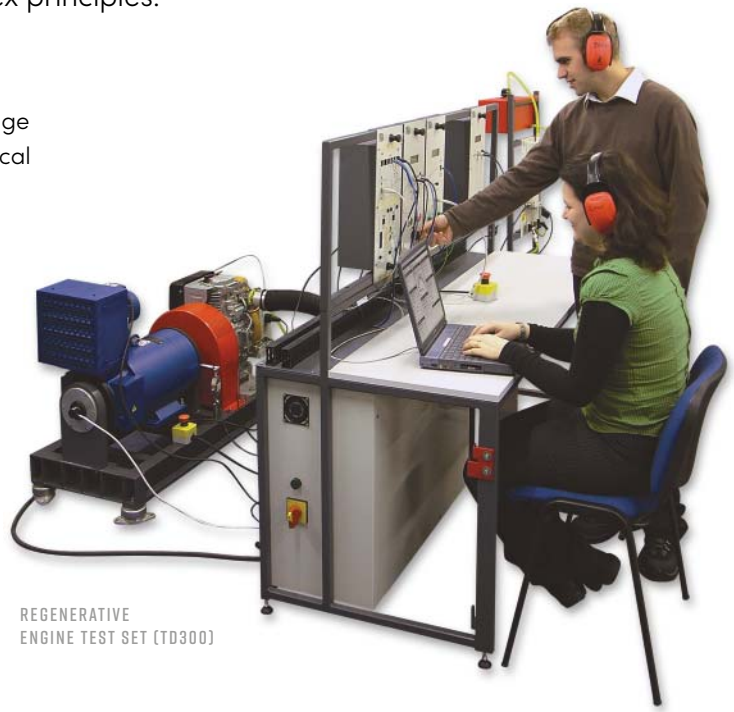
Steam, internal combustion engines and gas turbines – the range offers the opportunity for students to understand how mechanical power is produced and their relevant efficiencies with various different techniques.

FOR ALL TERTIARY EDUCATION LEVELS

The Engines range offers equipment to meet entry level requirements through to final-year studies. Students can learn about simple four-stroke engines, before progressing to engine cycle analysis and a variety of gas turbines.

KEY EXPERIMENTS:

- Internal combustion engines
- Steam
- Gas turbines



REGENERATIVE
ENGINE TEST SET (TD300)

KEY FEATURES AND BENEFITS

MODULAR: Entry level packages with further options available.

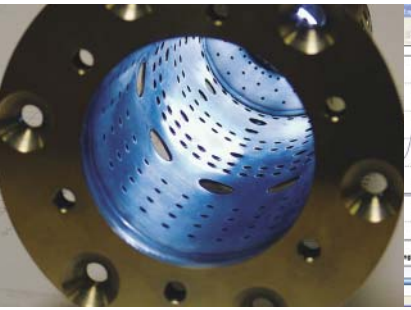
DESIGNED FOR SAFETY: Suitable for all university student levels.

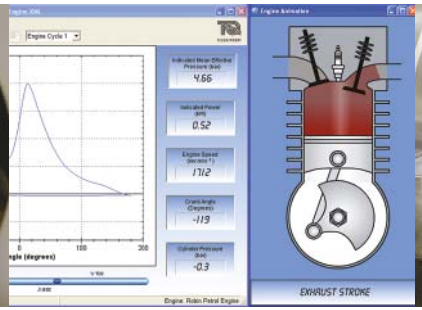
SPECIALIST: The whole range has been developed to provide the perfect facility for education, both academic and industrial.

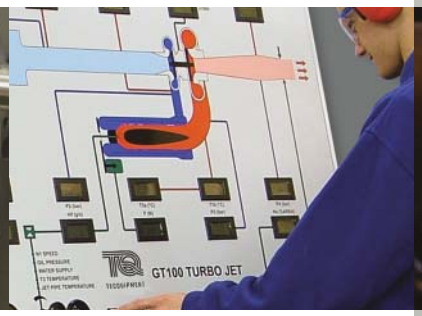
AUTOMATIC DATA ACQUISITION

VDAS® Most of the products in this range work with TecQuipment's Versatile Data Acquisition System (VDAS®).

ADA TecQuipment's gas turbine products work with our unique Gas Turbine software.







ENVIRONMENTAL CONTROL

KEY FEATURES AND BENEFITS

FUNDAMENTALS OF HVAC: The range provides the capabilities to study the fundamental components of an HVAC course.

DATA ACQUISITION AS STANDARD: Most products in the range come with TecQuipment's Versatile Data Acquisition System, offering high specification and great value.

INDUSTRIAL AND DOMESTIC : With units covering air-conditioning and cooling towers, students can study the elements of both industrial and domestic environmental control.

AUTOMATIC DATA ACQUISITION VDAS®

Most of the products in this range work with TecQuipment's Versatile Data Acquisition System (VDAS®).

All the units in our Environmental Control range are compact in size to facilitate flexible and convenient use around any laboratory.

APPLICATION OF FUNDAMENTAL PRINCIPLES

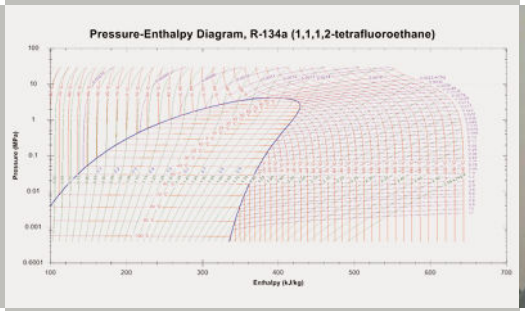
The range applies the fundamental theories of thermodynamics, fluid mechanics and heat transfer to investigate methods of environmental control in the real-world.

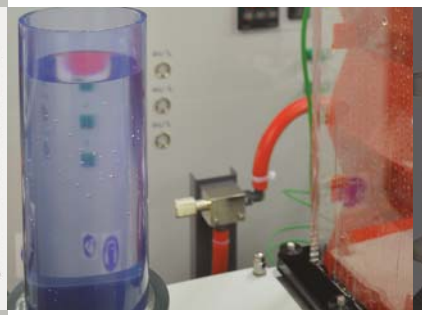
KEY EXPERIMENTS:

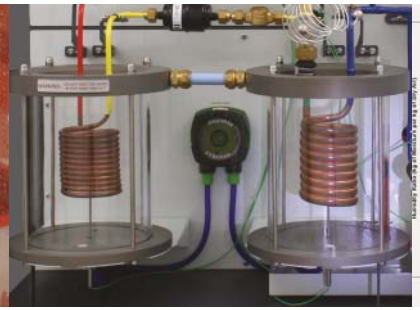
- Cooling
- Air conditioning
- Refrigeration
- Humidity

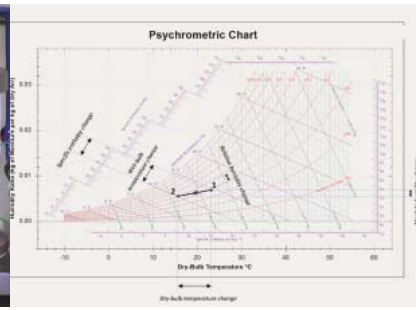
HUMIDITY MEASUREMENT (TE6)

COOLING TOWERS (EC1000)









SOLAR ENERGY

TecQuipment recognises the importance of products that demonstrate future technologies.

PRODUCTS FOR THE FUTURE

Our Solar Energy range covers three key methods used to harness and convert solar energy:

- Photovoltaic (conversion to electricity)
- Focusing (to a collector)
- Flat plate collection (direct water heating)

PHOTOVOLTAIC CELLS (TE4)

Many of the other founding principles of renewable energy are relevant to other TecQuipment product ranges such as Aerodynamics, Fluid Mechanics and Control Engineering.

For example, our **MODULAR FLUID POWER** products include turbines to harness the energy in water.

The **AERODYNAMICS** and **FLUID MECHANICS** ranges include experiments to show how shapes affect air and water flow. These are essential tools for engineers when designing wind or water energy systems.

KEY EXPERIMENTS:

- Performance and use of solar panels
- Performance, advantages and limitations of a focusing solar energy collector
- Efficiency of a flat plate solar energy collector

KEY FEATURES AND BENEFITS

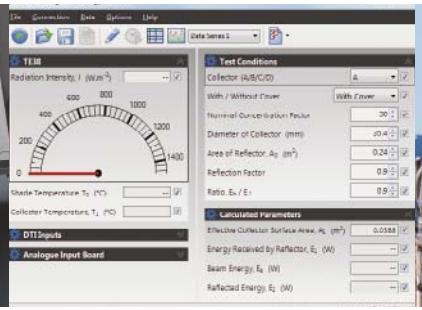
PHOTOVOLTAIC, FOCUSING AND FLAT PLATE ENERGY COLLECTION: Demonstrates three key methods used in harnessing solar energy.

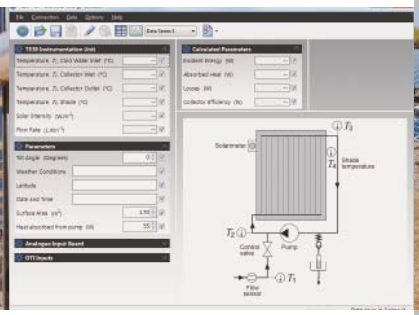
AUTOMATIC DATA ACQUISITION: VDAS® is particularly useful when monitoring longer duration experiments.

SAFE AND EASY SET UP: Low temperatures, safe connections and simple hand-operated controls allow you to set up an experiment safely and quickly.

AUTOMATIC DATA ACQUISITION VDAS®

Most of the products in this range work with TecQuipment's Versatile Data Acquisition System (VDAS®).





VERSATILE DATA ACQUISITION SYSTEM

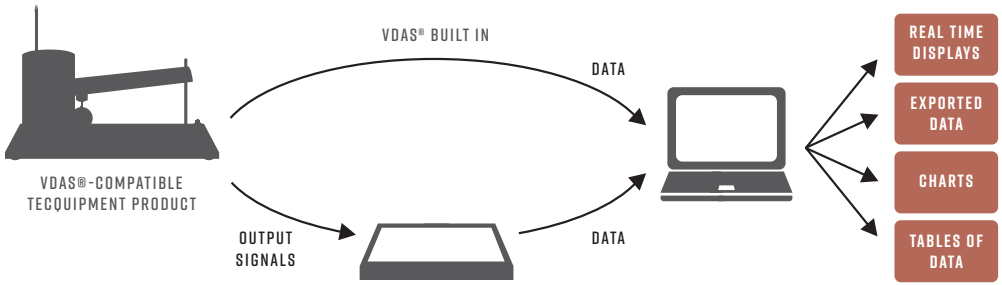
KEY FEATURES AND BENEFITS

- Cost-effective digital automatic data acquisition hardware, software and accessories to enhance teaching and laboratory sessions
- Real-time traces, data capture, monitoring and display of your experiment readings on a computer
- Available in both frame-mounting and bench-top options for convenience
- Similar software layout for all VDAS® compatible products – no need to learn new software when changing experiments

High-capacity, accurate, efficient and user-friendly automatic data acquisition for over 60 TecQuipment products.

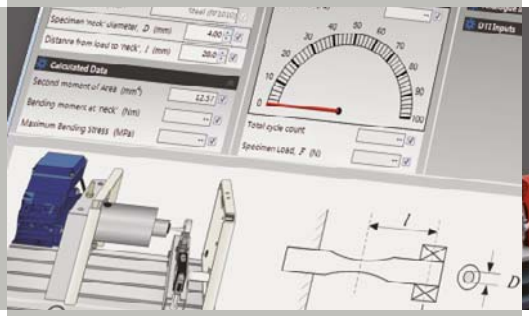
VDAS®

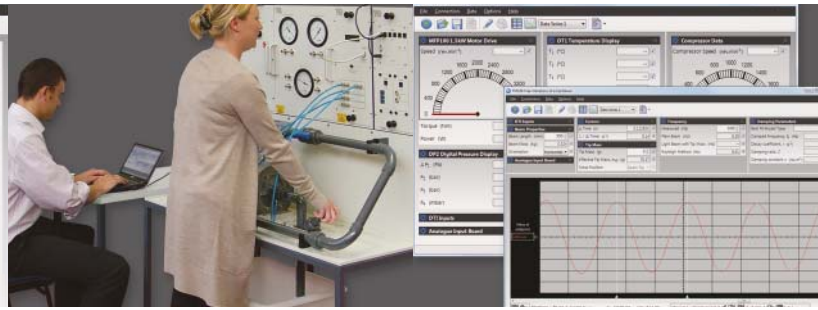
FRAME-MOUNTING AND BENCH-TOP VERSATILE DATA ACQUISITION SYSTEM INTERFACE UNITS (VDAS-F AND VDAS-B)



LABVIEW DATA ACQUISITION

Experimental data from all TecQuipment VDAS® compatible products can be acquired in real-time within National Instrument's LabVIEW software environment. LabVIEW users have the flexibility to extend TecQuipment's software to perform novel data processing, presentation and analysis.





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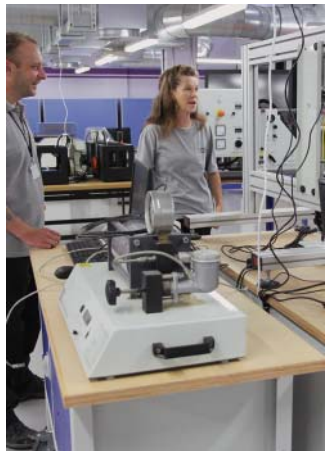
SATISFIED CUSTOMERS AROUND THE WORLD

TECQUIPMENT



"The Structures equipment from TecQuipment is being used to teach student groups at undergraduate level. There is minimal setup required and students are easily able to switch between experiments. The excellent quality of the TecQuipment manuals has enabled us to design our labs with relative ease. The equipment was delivered on schedule and the AYVA team has been very diligent in following up and providing us with the resources we need in a timely fashion.

Dr H J Kwon, Professor, Department of Mechanical and Mechatronics Engineering, University of Waterloo, Canada

"We believe that your visit to make our wind tunnel ready to train our students and staff was a great success and we thank you for the great effort you did for us. It was very effective and useful work that raised the spirits of all the Aeronautical Engineering Department staff as well as the College Administration.

Dr Ahmed Ibrahim Ahmed, Dean, College of Engineering, Sudan University of Science and Technology

"Our students are comfortable while using products from TecQuipment in labs. Highly innovative products by TecQuipment Ltd for engineering education are ideal for engineering and technical education at all levels. Our students are regularly using this equipment for masters and doctoral research. The products are user-friendly and need minimum after-sales service.

Prof R D Misal, Defence Institute of Advanced Technology, Girinagar, Pune, India University of Science and Technology

"For a number of years now we have procured lab-based teaching resources from TecQuipment for use within mechanical and electrical engineering laboratories. Operation of this equipment, coupled with the robust build quality, provides students with a clear understanding of the intrinsic features behind thermo-fluids and mechanical principles. This instils confidence for a safe, hands-on experience demonstrating these principles in practice. Furthermore, the build quality of TecQuipment products also gives assurance that the investment made satisfies our ongoing teaching needs well in to the future

Graham Preece, Faculty of Computing, Engineering and Sciences, Staffordshire University

"The TecQuipment teaching solutions and scalable teaching equipment has allowed the Thermal Engineering and Energy Department to provide training up to Masters degree level with continuous and undeniable quality.

Prof Jean-Noël Blanchard, IUT Orleans, France

"At ECU we have been going through a rapid phase of expansion with our engineering programs since 2006. This has involved the establishment of a significant number of new laboratories and workshops, for which we have identified TecQuipment products to be among the best.

Prof Daryoush Habibi, Edith Cowan University, Australia

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