Creating skilled engineers

Working with STEM

Complete Engineering Program

Aligned to Qualifications

Knowledge and Skills Lessons

LJ CREATE™
Learning for life

Working with STEM

Engineering

Age 16+

Welcome

We're LJ Create, Education Specialists since 1979

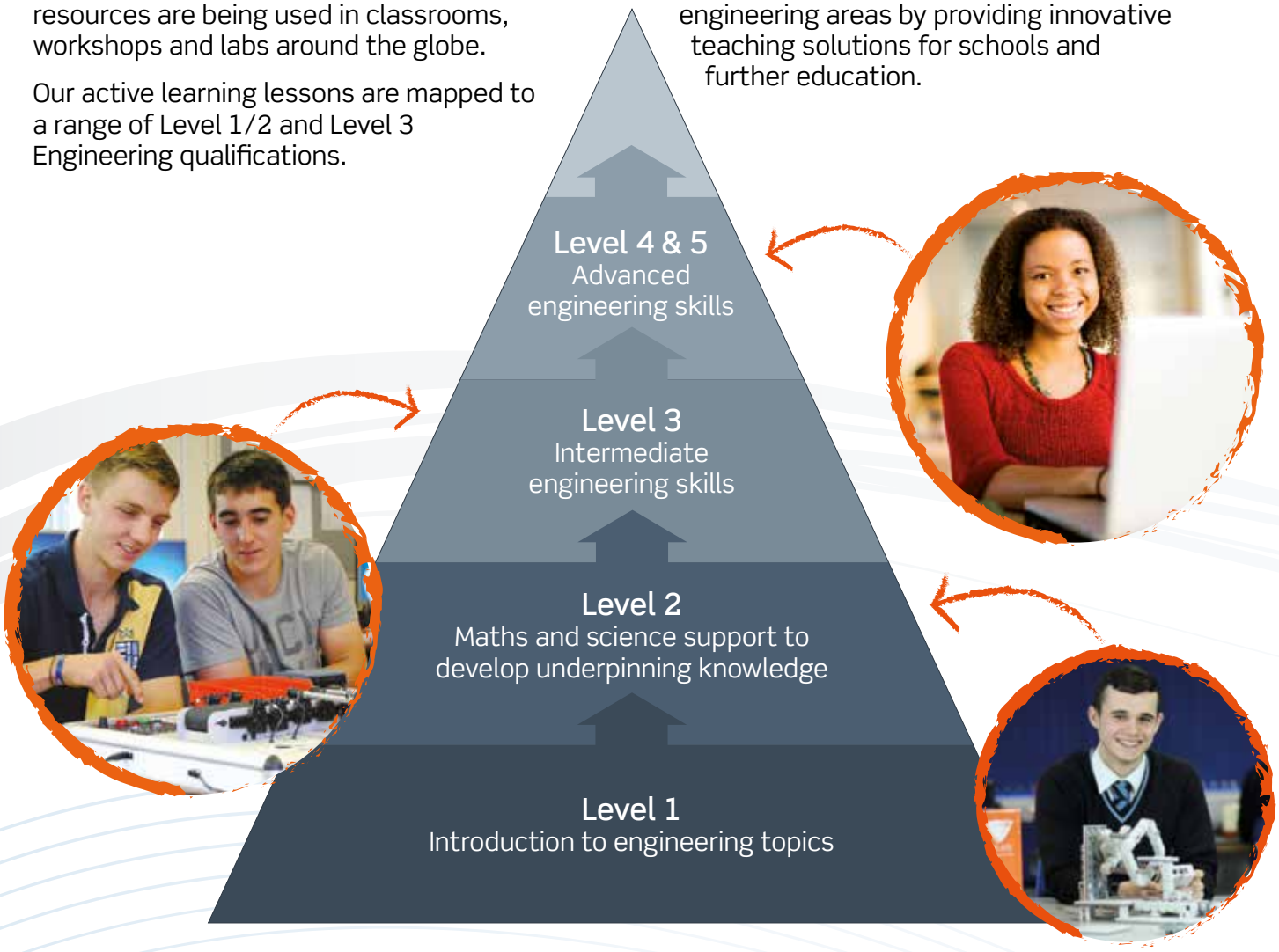
Since 1979 we have been providing award winning, world-class active learning solutions for technical education.

Today we create complete systems combining **digital lesson libraries** and **tailor-made hardware kits** that deliver innovative, inspiring learning in science, technology, automotive and engineering. Compliant to **ISO 9001 standards** of quality control, our engineering teaching resources are being used in classrooms, workshops and labs around the globe.

Our active learning lessons are mapped to a range of Level 1/2 and Level 3 Engineering qualifications.

These lessons provide project-based learning activities on hi-tech engineering hardware. Our advanced electronics resources are ideal for Levels 4 and 5.

On request, we can map our hardware and software to the learning standards you require. At LJ Create our mission is to **enable learners throughout the world to achieve their full potential** in a wide range of science and engineering areas by providing innovative teaching solutions for schools and further education.

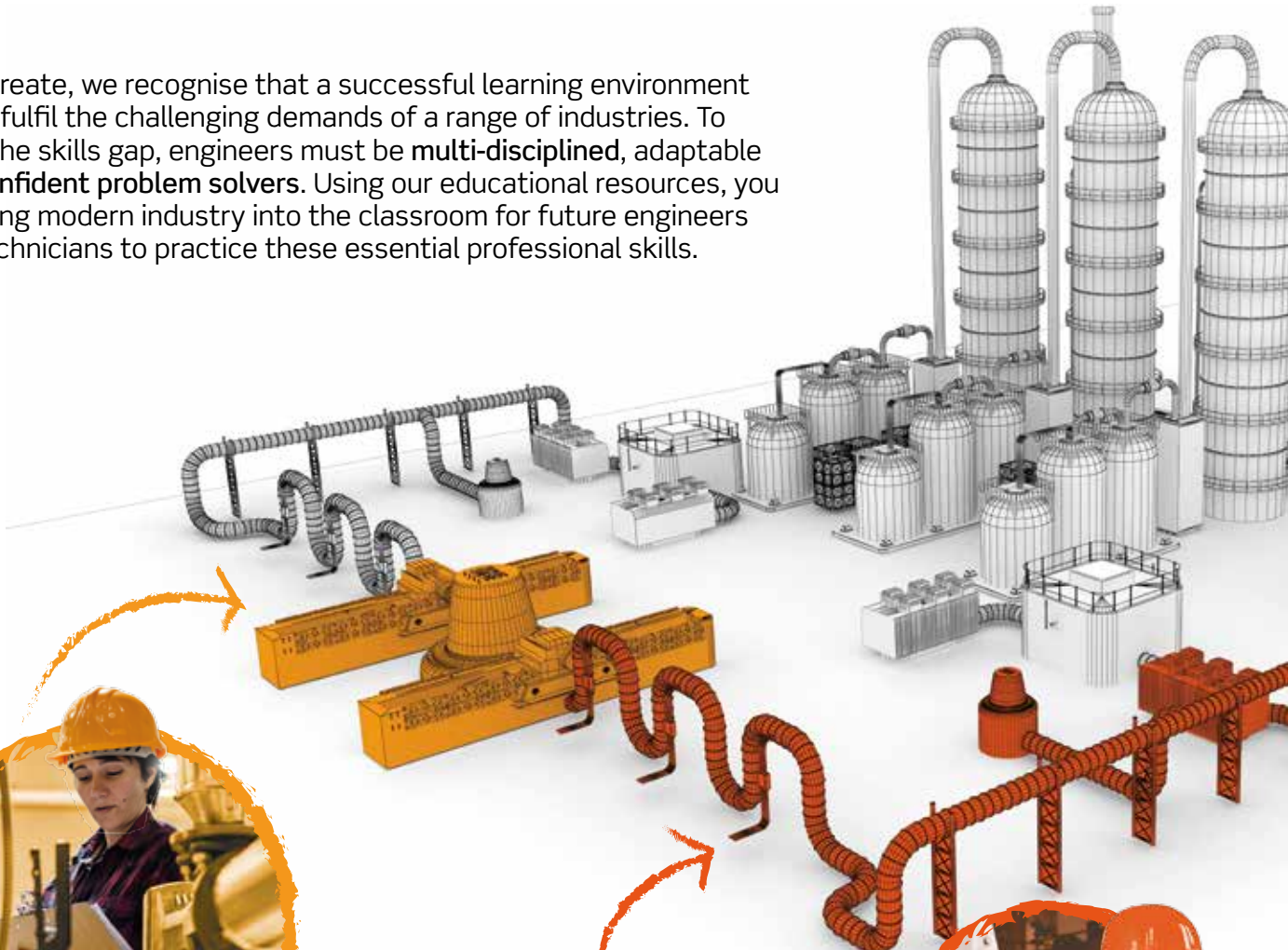


Contents

21st Century Engineering

Preparing engineers for the workplace

At LJ Create, we recognise that a successful learning environment has to fulfil the challenging demands of a range of industries. To close the skills gap, engineers must be **multi-disciplined**, adaptable and **confident problem solvers**. Using our educational resources, you can bring modern industry into the classroom for future engineers and technicians to practice these essential professional skills.

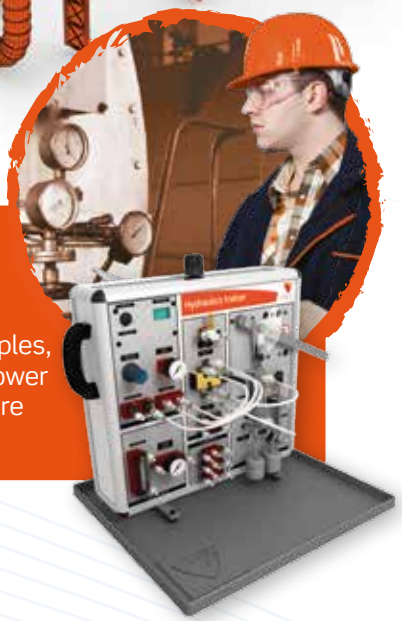


Control and Instrumentation

Harness ladder logic control and programming skills using industrial models and industrial standard PLCs.

Mechanical and Fluid Power

Investigate machine principles, construct/operate fluid power control systems and explore manufacturing processes.

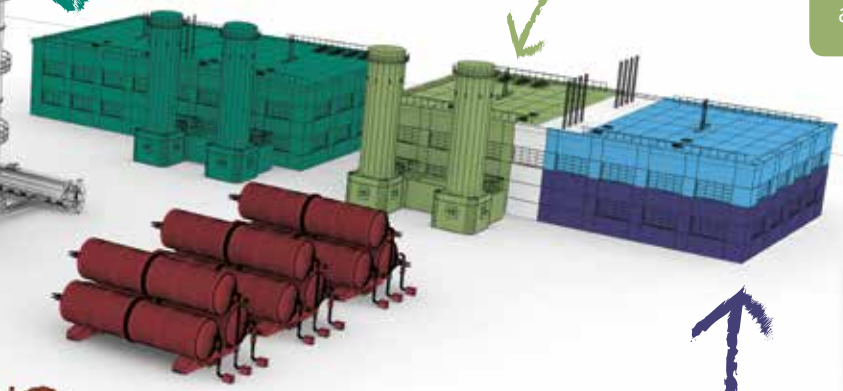


Electronics

Industry demands skilled technicians and design engineers. From beginner to advanced, develop the skills needed to assemble, configure, test and troubleshoot electronic systems.

Research, Design & Technology

Explore many applications, including green technology, telecomms, construction, manufacturing, agriculture and robotics. Solve challenges using the design loop along with maths and science skills.



Engineering Management

From basic employability skills to management, gain an understanding of business processes and develop the expertise needed to tackle common problems in the workplace.

Warehouse and Logistics

The management and distribution of goods requires critical thinking and a high degree of planning. Train for the logistical skills needed to optimise storage efficiency, loading, routing and stowage, and implement event-driven process chains.

Computer Programming

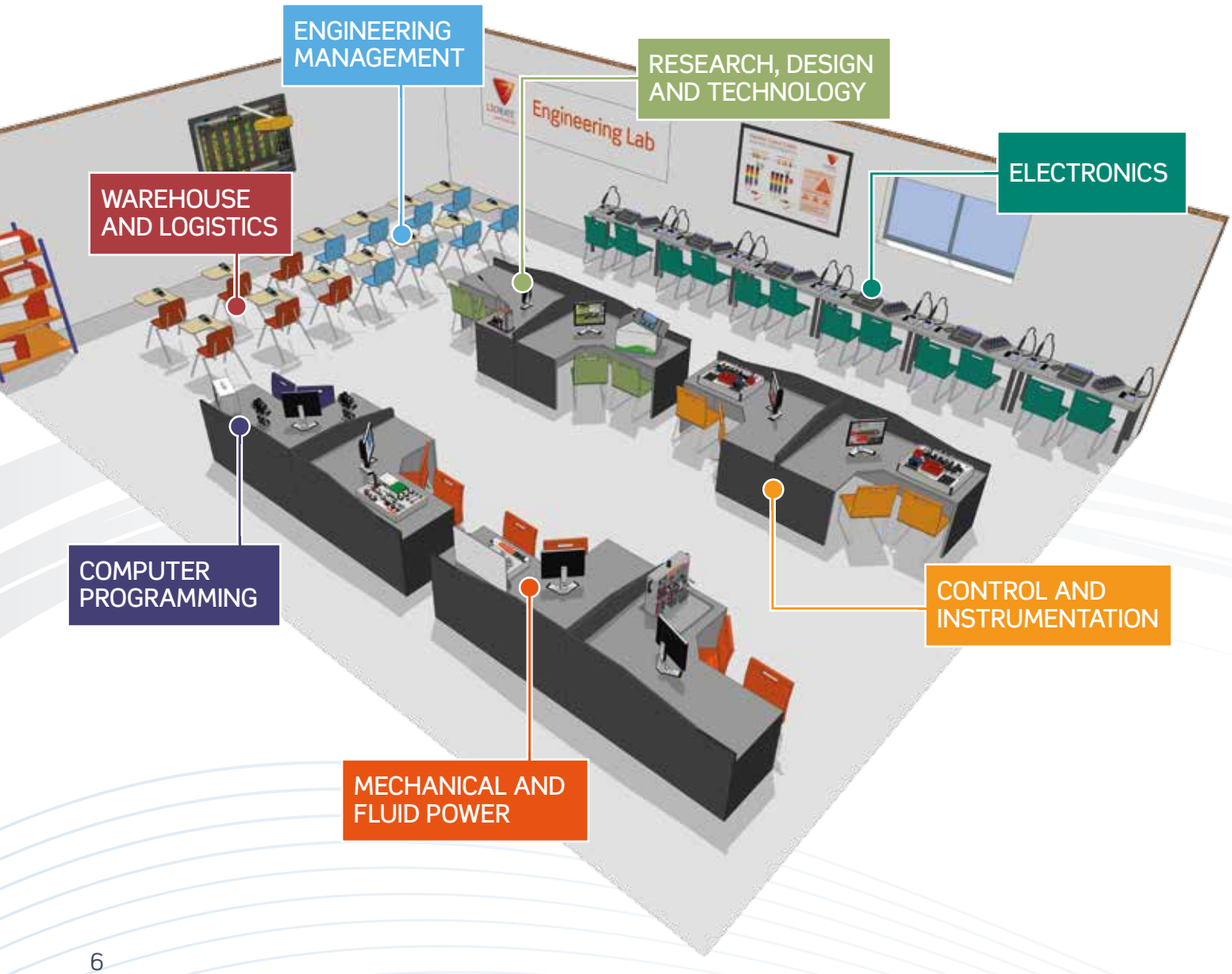
Develop application control systems using flowcharts, virtual 3D environments and C code, and build PIC® programs.

Teaching Journey

A program that supports you to teach from beginner to expert

Students perform best when they take ownership of their learning. Our online library of lessons gives you over **4,700 ready-made engineering learning units** by our team of teachers, engineers, programmers and graphic designers.

Our learning management system includes a course builder for you to search and string learning units together in seconds. We have also provided **ready-made courses** that link to the learning aims of the more popular qualifications.



Preparation

Plan Lessons

Reduce your preparation time using our LMS that links lessons to learning aims. Build your own e-learning courses and assign them to student groups.

Knowledge

Explore Theory

Online presentations for use in front-of-class or at home as part of an e-learning program to reinforce theoretical understanding.

Further Study

Apply Knowledge

Investigations for students to apply their knowledge, including simulators to develop problem-solving skills in virtual environments.

Assess Knowledge

Formative assessments to test the knowledge students have acquired during presentations and investigations.

No

Can student demonstrate knowledge?

Yes

Skills

Practice Skills

Some lessons include hands-on tasks for real-world practice using clean, safe equipment for the classroom.

Further Study

Assess Skills

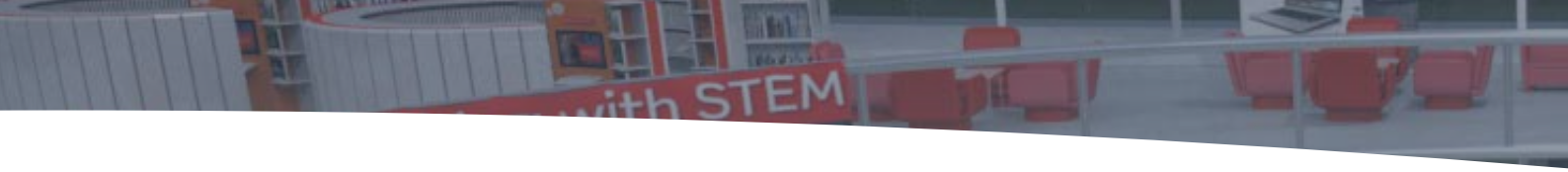
Formative assessments that test students on the practical skills they have learnt in the lab.

No

Can student apply knowledge to perform practical tasks?

Yes

Continue Progress



Online Lessons

Topics from our library of over 4,700 learning units

Our online library is a comprehensive resource of engineering lessons. Students can access the presentations, investigations and assessments in our library through an online portal; no specialist software or downloads are needed.

Using our LMS, teachers can quickly select and assign lessons to student groups where student progress can be tracked and reported. Ready-made courses for the more popular qualifications are also available.

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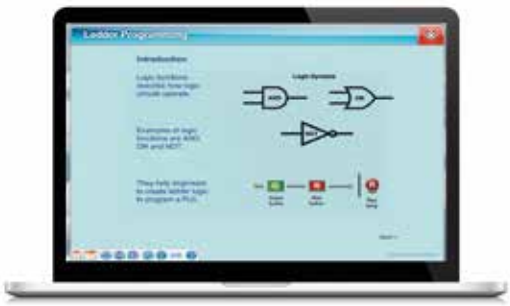
CONTROL AND INSTRUMENTATION

Industrial Control (159 learning units)

- Feedback Control Systems
- Programmable Logic Control
- Construction and Function of a PLC
- Connecting a PLC
- Digital and Analogue Inputs and Outputs
- Sequence Control System
- PLC Programming
- GRAFCET Sequence Control Systems
- Ladder Programming
- PLC Latches, Counters, Timers and Memory Stores
- Rotary Encoder
- Conveyor Application Control
- Parts Sorter Application Control
- Step 7 Programming
- Fieldbus, AS Interface, and Profibus DP



Transducers, Instrumentation and Control (189 learning units)

- Basic Control Systems Equipment & Terms
- Positional Resistance Transducers
- Wheatstone Bridge Measurements
- Environmental Measurement
- Temperature, Sound and Light Sensing
- Linear Position and Force Applications
- Linear and Rotational Motion
- Rotational Speed and Position Measurement
- Display Devices
- Signal Conditioning
- Comparators, Oscillators and Filters
- Mathematical Operations
- Position and Speed Control Systems

Analogue and Digital Motor Control (158 learning units)

- Transient and Steady State Response
- Proportional Speed and Position Control
- Second Order Response Parameters
- Velocity and Transient Velocity Feedback
- Controller Characteristics
- Proportional Plus Integral Speed Control
- Proportional Plus Integral Plus Derivative Position Control
- Stability and Instability
- Three-Term, PID Control
- Time Response
- Frequency Response
- Computer Control
- Analogue and Digital Interfacing
- Digital Interfacing

Data Acquisition of Control Systems (37 learning units)

- Thermal and Light Controlled Systems
- Temperature Transducer Response
- Proportional, Integral and Derivative Control
- Velocity Feedback

Avionics (66 learning units)

- Single Engine Aircraft Electrical and Power Systems
- Troubleshooting
- Single Engine Power Supply and Distribution Systems
- Landing Gear Control and Indication Systems
- Flap Control Systems
- Stall Warning Systems
- Take Off Warning Systems
- Temperature Systems
- Fuel Quantity and Fuel Flow Measurement

MECHANICAL AND FLUID POWER

pages 18-19 HARDWARE

Engineering Drawing (42 learning units)

- Drawing Standards
- Basic Geometric Construction
- Types of View
- Co-ordinate Systems
- Dimensions
- Roughness
- Sectional Views
- Drawing Analysis
- Screws and Threaded Components
- Machine Elements
- Tolerances and Fits
- Drilling and Finishes
- Fluid Power Diagrams
- Permanent Connections

Inspection, Maintenance and Quality Management (60 learning units)

- Working with Powers and Standard Form
- Accuracy
- Measuring Lengths and Pythagoras' Theorem
- Measuring and Calculating Angles
- Measurement Tolerances and Calculations
- Clearances and Fits
- Quality Management
- Statistical Analysis
- Maintenance Principles and Accident Prevention
- Maintenance Inspection and Documentation
- Diagnostics and Troubleshooting
- Mechanical Breakdown
- Fault Repair

Machine and Instrument Engineering (72 learning units)

- Mechanical Units
- Mass and Volume Flow Rate
- Energy, Work, Power and Efficiency
- Transferring Mechanical Energy
- Torque and Power
- Stress-Strain Analysis
- Stress Calculations in Joints
- Manufacturing Facilities
- Material Conversion
- Plain and Rolling-Element Bearings
- Seals and Gaskets
- Joining Hubs to Shafts
- Simple and Compound Gears and Drives
- Gear Calculations and Design Factors
- Clutches, Traction Drives and Adjustable Speed Transmission

Mechanical Systems (62 learning units)

- Machines
- Machine Design
- Friction
- Lubricants, Bushes and Bearings
- Inclined Planes
- Levers
- Gears and Simple Gear Trains
- Compound Gear Trains and Special Gears
- Pulleys
- Cams and Cranks

Fluid Power (150 learning units)

- Principles of Pneumatics
- Pneumatic Components, Symbols and Circuits
- Pneumatic Cylinders and Valves
- Pneumatic Logic
- Pneumatic Applications and Problem Solving
- Sequential and Automatic Control Circuits
- Pneumatic Circuit Time Delays
- Electro-pneumatics
- Levers and Movement
- Principles of Hydraulics
- Hydraulic Components, Symbols and Circuits
- Hydraulic Applications
- Hydraulic Cylinders
- Hydraulic Valves and Flow Control
- Hydraulic Actuators
- Creating Pressure with Pumps
- Fluid Power

Materials Engineering (51 learning units)

- Classification of Materials
- Iron and Steel
- Non-Ferrous Metals
- Ceramic and Sintered Materials
- Composite Materials
- Corrosion
- Polymers
- Lubrication
- Properties of Materials
- Structure of Metals
- Solutions and Phases
- Microstructure of Metals

Manufacturing Engineering (155 learning units)

- Manufacturing Processes
- Safety and Protective Measures
- Machine Tools and Terminology
- Primary Metal Shaping Processes
- Turning and Milling
- Grinding
- Drilling
- Bending
- Forming Procedures and Calculations
- Forging
- Erosive Manufacturing Processes
- Finishing Processes
- Environmental Protection
- Joining Processes
- Welding Processes
- CNC Programming
- Planning and Organising Work Processes
- Measurement

Topics from our library of online learning units

WAREHOUSE & LOGISTICS

Warehouse Management
(39 learning units)

- Basics of Storage
- Storage of Goods
- Picking Stock
- Packaged Goods
- Efficiency and Optimisation of the Warehouse

Freight Logistics
(66 learning units)

- Loading Goods
- Internal Transport and Loading
- Human Resources
- Route Planning
- Stowage Planning
- Event Driven Process Chains
- Information Processing

COMPUTER PROGRAMMING

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Information Technology
(135 learning units)

- Accessing the Internet
- Using MS Windows
- Word Processing
- Spreadsheets

Computer Science
(34 learning units)

- Algorithms and Problem Solving
- Program Inputs and Outputs
- Program Data, Constants and Variables
- Program Operators and Control Structures
- Program Documentation and Testing
- Program Design Projects
- Computer Systems

Microprocessors
(35 learning units)

- Microprocessor Architecture and Operation
- Number Systems
- Instruction Groups
- Subroutines and the Stack
- Microprocessor System Applications
- Designing and Entering Programs
- Running and Debugging Programs
- Actuator Control
- Using Feedback
- Embedded Computers and Memory

ENGINEERING MANAGEMENT

Business Skills
(199 learning units)

- Business Organisational Structure
- Corporate Mission and Goals
- Quality and Environmental Management
- Business Process Optimisation
- Procurement
- Stock Control and the Production Process
- Purchasing Calculations and Monitoring
- Material Requirements Planning (MRP)
- International Commercial Terms and Contracts
- Warehousing
- Production Management and Planning
- Analytical Techniques
- Production Process Control
- Financial Accounting and Bookkeeping
- Balance Sheet Accounting
- Profit and Loss Accounts
- Inventory Accounting Methods
- Marketing Planning
- Product, Advertising, Distribution and the Marketing Mix
- Pricing Strategies
- Sales and Marketing Measures
- Contracts and Legal Framework
- Economic Factors and Measures
- Investing, Leasing and Financing

Person Skills (24 learning units)

- Punctuality
- Dress Code
- Personal Space
- Attending a Meeting
- Handle Collective Property
- Common Courtesy
- Handling a Telephone Call
- How to Introduce Yourself
- Listening and Understanding
- Engage in a Two-Way Conversation

Workplace Problem Solving
(108 learning units)

- Developing Solutions to Production Scenarios
- Developing Solutions to Construction Scenarios
- Developing Solutions to Sales and Marketing Scenarios
- Developing Solutions to Finance Scenarios
- Developing Solutions to Customer Service Scenarios
- Developing Solutions to Human Resources Scenarios

Engineering Mathematics
(122 learning units)

- Units of Measure
- Approximation
- Arithmetic
- Fractions
- Percentages
- Length, Area and Volume
- Graphs and Charts
- Equations
- Algebra
- Factorisation
- Indices
- Trigonometry
- Phasors

English Language Skills
(47 learning units)

- Citing Evidence to Support Analysis
- Identifying and Analysing Ideas in a Text
- Understanding the Role of Structure
- Determining a Writer's Perspective
- Considering Whether Arguments are Credible and Accurate
- Understanding Multiple Sources of Information
- Evaluating Arguments and Specific Claims Made in a Text
- Planning, Writing, Presenting and Evaluating
- Discussing Different Perspectives
- Justifying Decisions with Reasoning
- Engaging in Group Discussions
- Presenting a Perspective to an Audience
- Speaking on the Telephone
- Arguing a Perspective
- Presenting a Persuasive Perspective
- Formal Letters with a Perspective
- Creating an Informative Text
- Informing an Audience
- Understanding and Using Perspective in a Narrative

RESEARCH, DESIGN AND TECHNOLOGY

pages 22-27 HARDWARE

Engineering Design (52 learning units)

- The Design Process
- Engineering Problems
- Alternative Solutions
- Models and Prototypes
- Communicating Engineering Design
- Design Projects
- Building and Testing
- Programming

Green Technologies (151 learning units)

- Electricity Generation and Power Transmission
- Fossil Fuels and Climate Change
- Nuclear Energy
- Biomass
- Geothermal Energy
- Hydropower
- Solar Power
- Stirling and Thermoacoustic Engines
- Wind Power and Wind Turbines
- Hydrogen Fuel Cell
- Energy in Buildings
- Glazing Materials and Systems
- Heat Pumps
- Passive Cooling
- House Heating Systems
- Insulating Buildings
- Solar Water Heating
- Energy Storage

Electronics Technology (132 learning units)

- Basic Electrical Quantities in Circuits
- Voltage, Current and Resistance
- Lamps and Switches
- Multimeter and Oscilloscope Measurement in Circuits
- Plan, Build and Test on Breadboard
- Plan, Build and Test on Stripboard
- Plan, Build and Test on Printed Circuit Board
- Troubleshooting
- Simple Lamp Circuit
- LED Lamp Circuit
- Automatic Light Circuit
- Power Supplies
- Baby Alarm Project
- Flashing Doorbell Circuit Project
- Freezer Temperature Warning Circuit Project
- Intruder Alarm Project
- Polarity Tester Project
- Elevator Door Controller Project
- Road Crossing Controller Project

Construction (26 learning units)

- Forces on Structures
- Skyscrapers
- Using Concrete for Building
- Beams
- Building Bridges
- Green Materials in Construction

Telecommunications (31 learning units)

- Early Communication
- Electronic Comms. in Everyday Life
- Broadcasting
- Digital TV and Radio
- Telephone Communication
- Cell Phone and Networks
- Communication on the Internet

Manufacturing Technology (53 learning units)

- Design Loop Projects
- Manufacturing Processes
- Plastic, Metal and Composite Materials
- Smart Materials
- Physical and Mechanical Properties of Materials
- Testing Materials
- Plastics Injection Moulding
- Hand Tools
- Machine Tools and Fabrication
- Recycling Waste
- 3D Printing and Fabrication

Transportation (88 learning units)

- Transportation Systems
- Transit System
- Propulsion Systems
- Transportation Logistics
- Maglev Mass Transit System
- Force and Momentum
- Passenger Safety
- Intelligent Vehicles
- Freight Transport
- Program Control
- Operating Costs
- Research and Design
- Design Loop Projects

Agriculture (22 learning units)

- Farming Technology
- Agricultural Machines
- Artificial Environments
- Irrigation
- Design Loop Projects

Biomedical Technology (22 learning units)

- Hygiene
- Sanitation
- Vaccination and Immunisation
- Pharmaceuticals
- Medical Scanning Diagnostic Equipment
- Design Loop Projects

Robotics (87 learning units)

- Industrial Robots
- Mobile Robots
- Space Robots
- Manual Control
- Programming
- Pre-programmed Sequences
- Sensors and Actuators
- Open and Closed Loop Control
- Part Transportation Around a Work-Cell
- Computer Integrated Manufacture
- Design Loop Projects

Scientific Processes (131 learning units)

- Laboratory Safety
- Field Safety
- Material Safety Data Sheets (MSDS)
- Using Equipment
- Scientific Method
- Data and its Uses
- Science and Society

Matter (70 learning units)

- Properties of Matter
- Fluids
- Solubility
- Measurement Errors
- Gas Laws

Topics from our library of online learning units

RESEARCH, DESIGN AND TECHNOLOGY (CONTINUED)

pages 22-27 HARDWARE

Forces and Motion (95 learning units)

- Types of Force
- Measurement of Force
- Force and Deformation
- Describing Movement
- Force and Acceleration
- Gravity
- Momentum
- Pendulums
- Free-Body Force Diagrams
- Projectiles

Energy (50 learning units)

- Forms of Energy
- Electrical Energy
- Heat Energy
- Work, Force and Energy
- Conservation of Energy

Electricity and Magnetism (51 learning units)

- Electrostatics
- Magnetism
- Electrical Circuits
- Electromagnetism

Waves (68 learning units)

- Wave Motion
- Electromagnetic Spectrum
- Oscillations, Resonance and Natural Frequency
- Wave Properties
- Transverse and Longitudinal Wave Characteristics
- Acoustic Waves
- Propagation of Sound
- Doppler Effect
- Light Waves
- Reflection, Refraction, Diffraction and Interference
- Polarisation
- Seismic Waves

Nuclear Physics (36 learning units)

- Emission Spectra
- Periodic Table
- Nuclear Forces
- Origins of Quantum Theory
- Mass Energy Equivalence
- Applications of Nuclear Physics
- Applications of Quantum Physics
- Quantum Mechanical Model of the Atom
- Discovery of Radioactivity
- Nuclear Equations
- Fission and Fusion

Chemical Structure and Bonding (79 learning units)

- Periodic Table and Properties of Elements
- Chemical Families
- Noble Gases
- Alkali Metals
- Alkaline Earth Metals
- Halogens
- Transition Metals
- Atomic Structure
- Chemical Bonding
- Carbon and its Compounds

Chemical Reactions (130 learning units)

- Types of Reaction
- Evaporation, Purification and Distillation
- Chromatography
- Dispersive Liquids
- Chemical Decomposition
- Redox
- Acids and Bases
- pH Scale
- Atomic Structure and Ions
- Chemical Formulas
- Rates of Reaction
- Electrochemistry
- Stoichiometry

Students can take our lessons home

Our comprehensive suite of lessons, simulators and applications (all accessible in a browser) makes our engineering program an ideal choice for distance or e-learning.

ELECTRONICS

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Electronic Systems (71 learning units)

- Systems and Sub-Systems
- Alarm Systems
- Inputs, Outputs and Processes
- Analogue Signal Processing
- Digital Signal Processing
- Electronic Components
- Closed Loop Control
- Energy and Power
- Fault Finding Electronic Systems

DC Circuits (134 learning units)

- Voltage and Current
- Resistance
- Electrical Energy and Power
- Capacitor Circuits
- Inductor Circuits

Electrical Networks (125 learning units)

- Voltage, Current and Resistance
- Series and Parallel Circuits
- Voltage Divider Principle
- Internal Resistance
- Kirchhoff's Laws
- Thevenin's Theorem
- Superposition Principle
- Measuring Instruments

AC Circuits (129 learning units)

- Effective Values of Alternating Voltages and Currents
- Measuring with an Oscilloscope
- Period and Frequency
- Peak, Peak-to-Peak and RMS Values
- Capacitor Circuits
- Inductor Circuits
- Capacitive and Inductive Reactance
- Graphical Representations and Equations of RLC Circuits
- Phase Difference and Power
- LC Oscillator Circuit and Resonant Frequency

Magnetism and Electromagnetism (39 learning units)

- Magnetic Principles
- Electromagnetism
- Self-Inductance of Inductors
- Magnetic Flux and Flux Density
- Transformers
- The DC Motor
- Fault Finding Electromagnetic Devices

Electrical Engineering (75 learning units)

- Electrical Installation in Residential Buildings
- Components of an Electrical Installation
- Lighting Systems
- Heating and Cooling Technology in the Home
- Technical Building Management System
- Safeguards Against Electric Shock
- Earthing Systems
- Cables and Wires
- Circuit Breakers
- Testing to Electrical Standards
- Ingress Protection and IP Codes
- Production, Transmission and Distribution of Electrical Energy

Linear Electronics (57 learning units)

- Analogue Circuits
- Inverting and Non-inverting Operational Amplifier Circuits
- Filter Circuits
- Oscillator Circuits
- IC Sensors
- The 555 Timer
- Analogue Switches
- Power Supplies
- Fault Finding Linear Electronic Circuits

Semiconductors (155 learning units)

- Diodes
- Bridge Rectifiers
- BJT and FET Transistors
- Transistor Amplifiers
- SCRs
- Optoelectronic and Display Devices
- Fault Finding Semiconductor Circuits

Power Electronics (137 learning units)

- Three-phase AC
- Star and Delta Connections
- Single-Phase and Three-Phase AC Motors
- The Induction Motor
- Three-Phase Rectifiers and Inverters
- Motor Starting and Speed Control
- Motor Drive Connection Components
- Efficiency of Electric Motors
- Construction, Selection and Controlling Contactors
- Motor Protection and Interlock Systems
- Frequency Converters
- EMC

Digital Electronics (291 learning units)

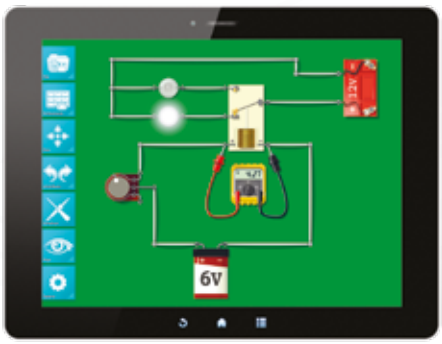
- Number Systems
- Logic Gates
- Logic Families
- Boolean Algebra
- Combinational Logic
- Karnaugh Maps
- Integrated Circuit Memory
- S-R Latch
- D-Type and J-K Flip-Flops
- Synchronous Counters and Shift Registers
- Half and Full Adders
- Monostable and Astable IC Circuits
- Magnitude Comparator
- Encoders and Decoders
- Multiplexers and Demultiplexers
- D-A and A-D Conversion
- Bi-directional Driver & Tri-State Interface
- Analogue Switch
- Fault Finding Digital Circuits

Telecommunications (31 learning units)

- Electronic Communication Systems
- AM Transmission
- Optical Transmission
- Simplex and Duplex Transmission
- Phase Locked Loops
- Digital Data Transmission
- Antennas
- Fault Finding Telecommunication Circuits

Circuit Construction and Testing (129 learning units)

- Safety and Accident Prevention
- Plan, Build & Test on Breadboard
- Plan, Build & Test on Stripboard
- Plan, Build & Test on Printed Circuit Board
- Applications of Electronics Project



Control and Instrumentation
Hardware

Industrial Control Trainer Teaching Set (290-00)

From beginner to expert, this teaching set brings a factory floor conveyor sorting system into the classroom. Students perform a comprehensive range of PLC programming tasks using a Siemens controller.

Our innovative simulation software is included to help introduce the basic concepts of PLCs and ladder logic. Programs developed by the student can be used to control either the hardware or the simulator.

Order as:

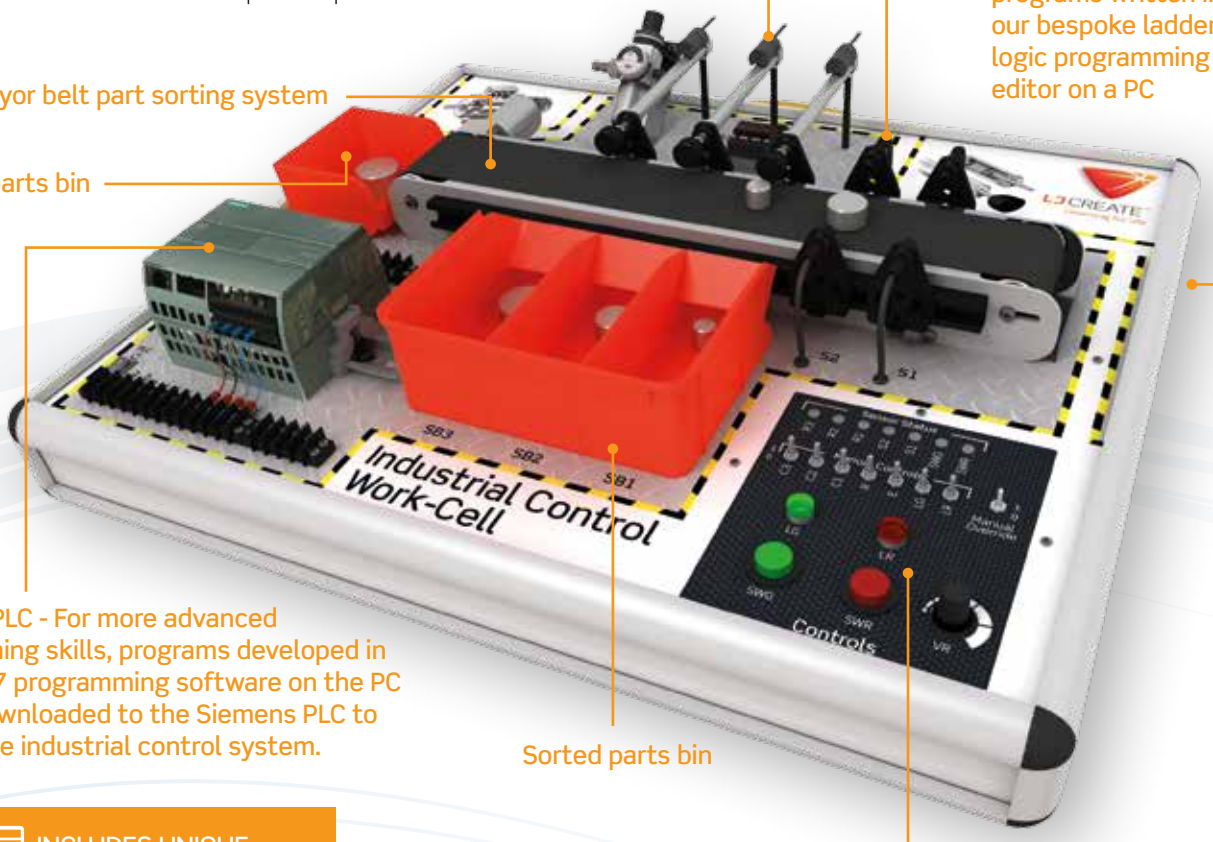
- 290-00 Industrial Control Trainer Teaching Set

Teaching set includes:

- 290-01 Industrial Control System
- 290-02 Siemens S71200 + Step 7 PLC pack

Typical practical tasks and topics include:

- Industrial controllers
- Logic (AND, OR, NOT), truth tables and step logic
- Latching actuators
- Counting parts
- Timing events



INCLUDES UNIQUE SIMULATION SOFTWARE

PLC Trainer Teaching Set (291-00)

From beginner to expert, the PLC training system offers a rotating disc sorting application to teach the fundamentals of PLC control. We also include our unique software simulation in the package to help introduce the basic concepts of PLCs and ladder logic.

Order as:

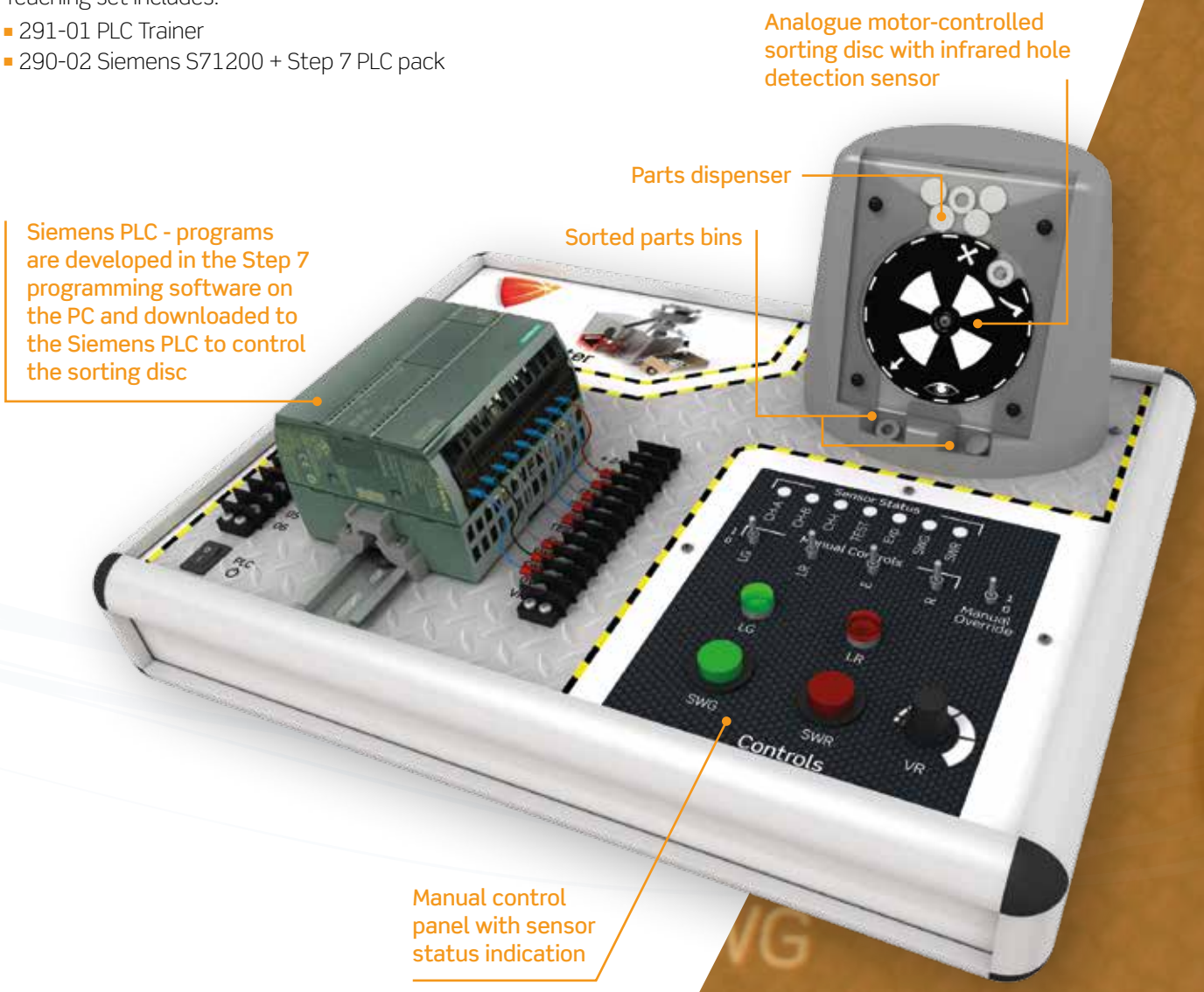
- 291-00 PLC Trainer Teaching Set

Teaching set includes:

- 291-01 PLC Trainer
- 290-02 Siemens S71200 + Step 7 PLC pack

Typical practical tasks and topics include:

- Create ladder logic programs
- Logic, truth tables and step logic
- Counting parts and timing events
- Analogue input sensing
- Rotary encoder monitoring



Control and Instrumentation
Hardware

Transducers, Instrumentation and Control Trainer (217-50)

The Transducers, Instrumentation and Control Trainer introduces students to input sensors, output actuators, signal conditioning circuits and display devices through a wide range of hands-on practical activities.

Typical practical tasks and topics include:

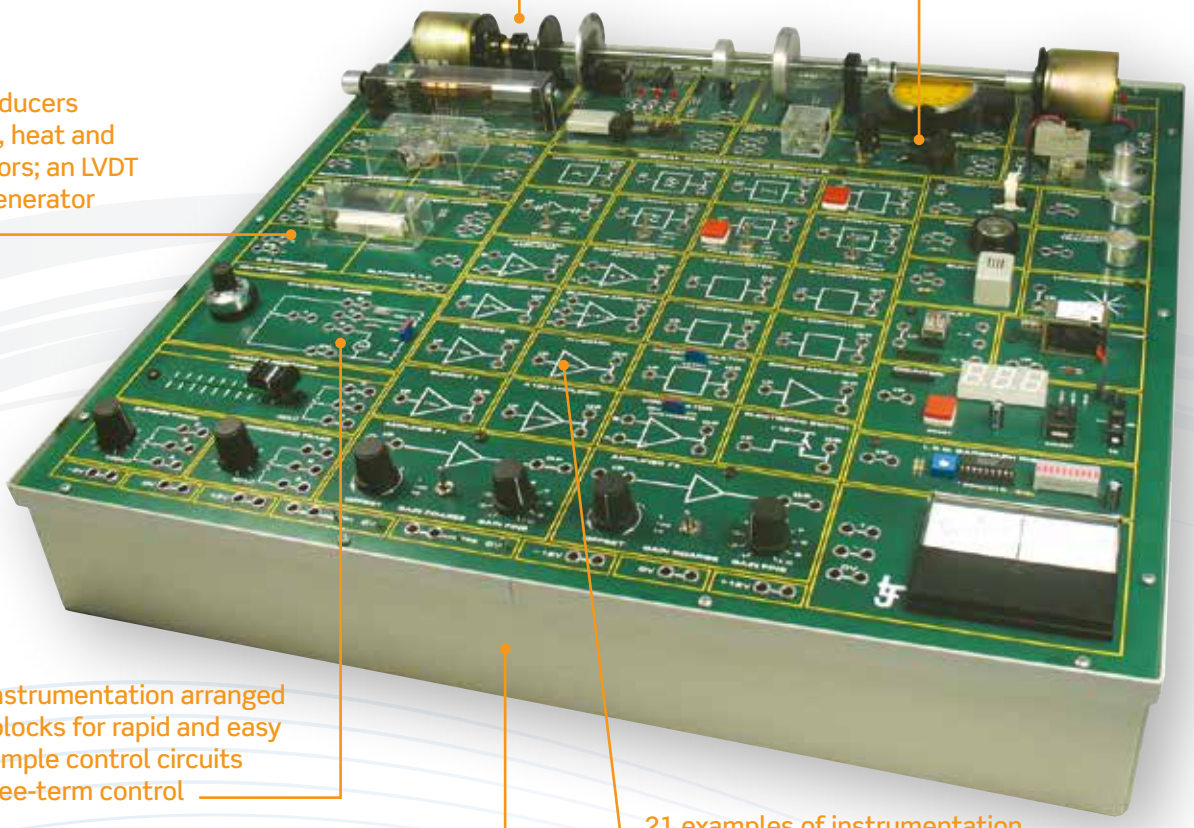
- Electronic switch
- Positional resistance transducers
- Wheatstone bridge measurements
- Temperature sensors
- Light measurement
- Environmental measurement
- Rotational speed or position measurement

Order as:

- 217-50 Transducers, Instrumentation and Control Trainer

Also available:

- 217-60 Data Acquisition of Control Systems (This is a virtual instrument unit that allows a PC to act as a set of test instruments. Instruments include an oscilloscope, multimeter, spectrum analyser signal generator and data logger.)
- 217-00 Transducers, Instrumentation and Control Teaching Set (Includes 217-50 and 217-60)



Analogue and Digital Motor Control Teaching Set (207-00)

This system provides the complete solution to teaching analogue and digital motor control. The heart of the system is a mechanical unit which produces repeatable, text-book results every time.

Order as:

- 207-00 Analogue and Digital Motor Control Teaching Set

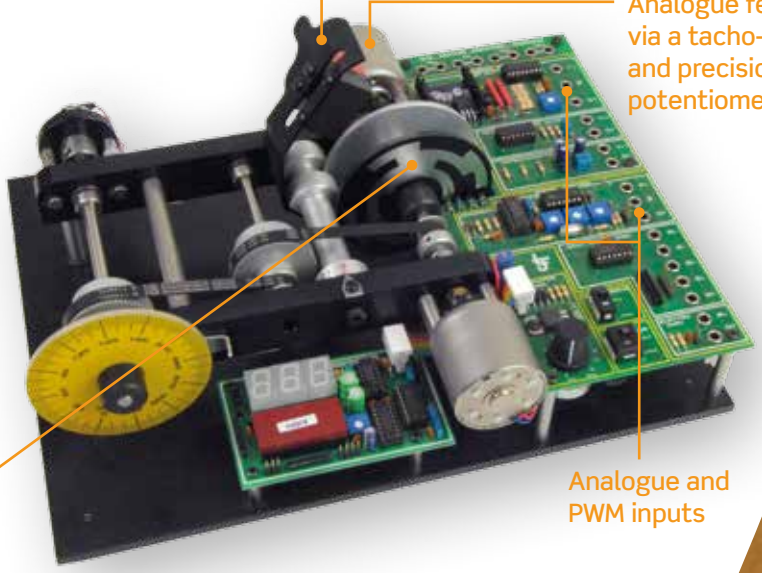
Teaching set includes:

- 207-02 Virtual Control Laboratory
- 207-03 Command Potentiometer
- 207-04 PID Controller Module
- 207-05 4mm Connection Lead Set
- 207-15 D.C. Motor Control Module
- 207-40 Power Supply Unit

Virtual control laboratory

Variable eddy current brake

Analogue feedback via a tacho-generator and precision potentiometer



Digital feedback from Gray code and slotted discs

Analogue and PWM inputs

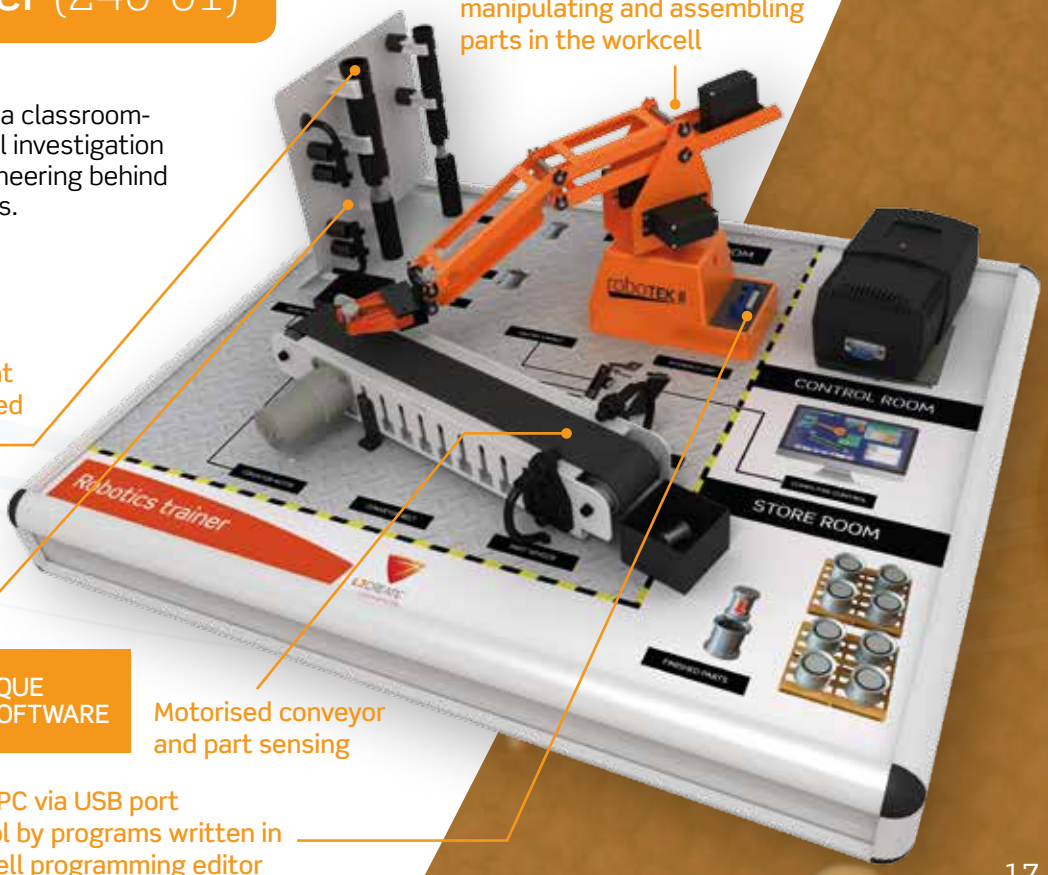
Robotics Trainer (240-01)

The Robotics Trainer offers a classroom-based resource for practical investigation of the technology and engineering behind modern automated systems.

Order as:

- 240-01 Robotics Trainer

Articulated robot for manipulating and assembling parts in the workcell



Parts from the 2-component parts dispenser are collected by the robot arm

Part sensing to check for a hole in the container part

INCLUDES UNIQUE SIMULATION SOFTWARE

Motorised conveyor and part sensing

Robot connects to PC via USB port interface for control by programs written in our bespoke workcell programming editor

Mechanical and Fluid Power
Hardware

Hydraulics Trainer (280-01)

The Hydraulics Trainer offers a portable classroom-based resource for practical investigation of hydraulic components and systems. The trainer uses quick-release hydraulic hoses to allow rapid circuit connection and setup.

A Fluid Power Resource Pack is ideal for a whole-class introduction to fluid control using syringes and hoses.

Typical practical tasks and topics include:

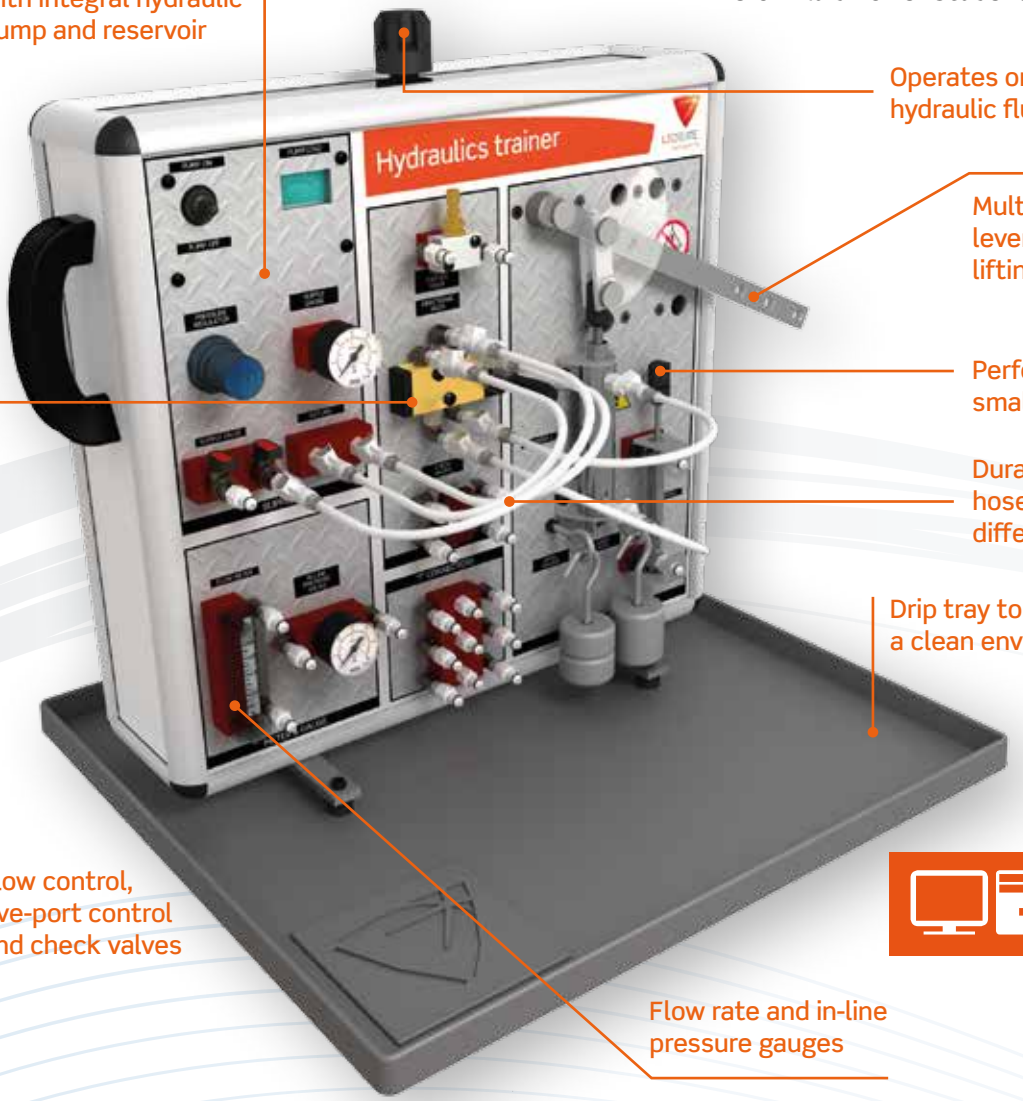
- Principles of hydraulics
- Valves and flow control
- Creating pressure with pumps
- Cylinder design

Order as:

- 280-01 Hydraulics Trainer

Also available:

- 278-01 Fluid Power Student Resource Pack



Fluid supply controls with integral hydraulic pump and reservoir

Operates on safe erifon-based hydraulic fluid

Multi-order configurable lever arm mechanism for lifting weights

Performance comparison of small and large cylinders

Durable, quick-release hoses for configuring lots of different hydraulic circuits

Drip tray to maintain a clean environment

Flow control, five-port control and check valves

Flow rate and in-line pressure gauges

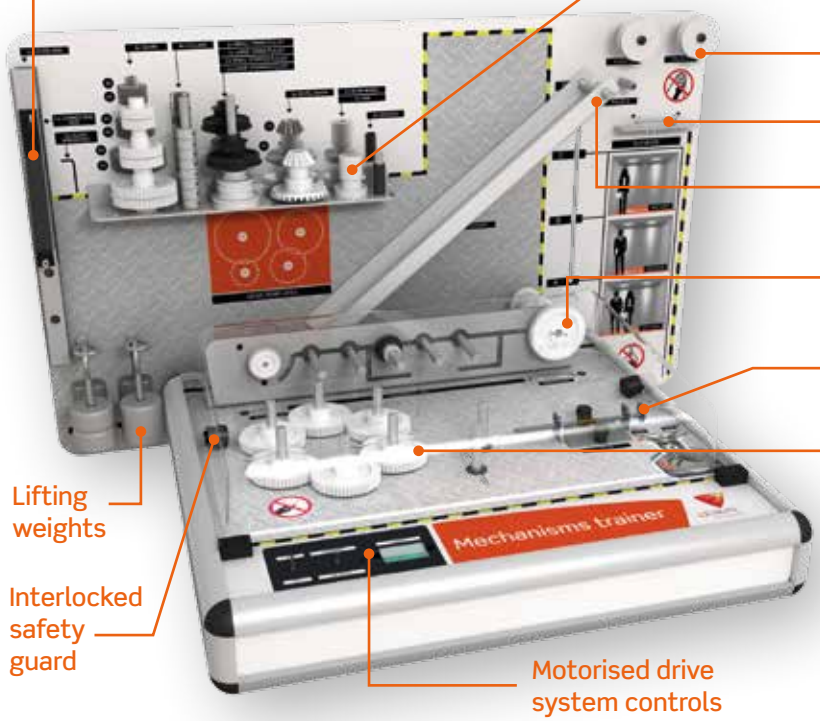
INCLUDES UNIQUE SIMULATION SOFTWARE

Mechanisms Trainer (260-01)

The Mechanisms Trainer offers a classroom-based resource for practical investigation of a variety of fundamental mechanical systems.

Order as:

- 260-01 Mechanisms Trainer



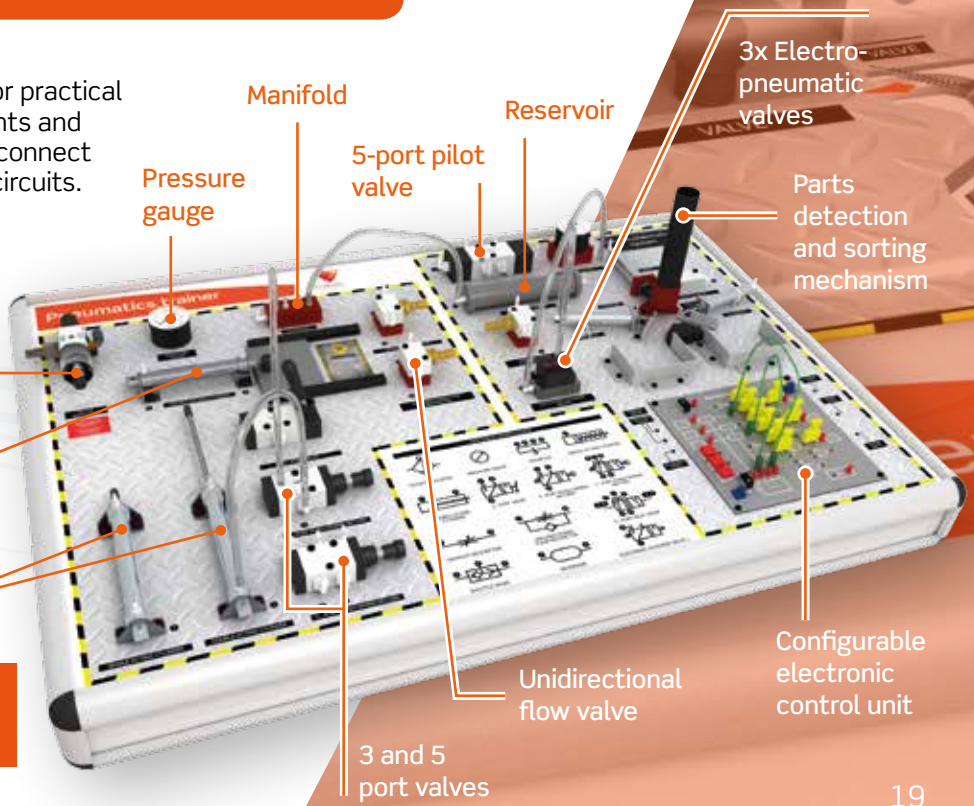
INCLUDES UNIQUE SIMULATION SOFTWARE

Electro-Pneumatics Trainer (270-01)

Offers a classroom-based resource for practical investigation of pneumatic components and systems. The trainer allows users to connect components to create fundamental circuits.

Order as:

- 270-01 Electro-Pneumatics Trainer



INCLUDES UNIQUE SIMULATION SOFTWARE

Computer Programming
Hardware

Educational Robotics Invention Kit - ERIK (250-01)

The Educational Robotics Invention Kit provides students with an environment that motivates them to learn abstract computer science concepts in a bid to solve practical problems with physical outcomes.

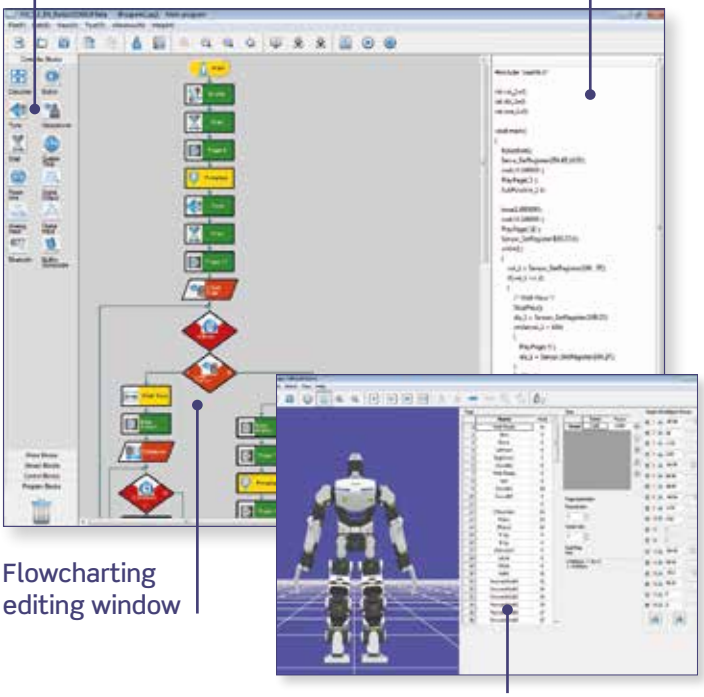
The combination of engineering and programming creates a dynamic environment that helps students develop problem-solving skills that involve mathematics, engineering, science and logic.

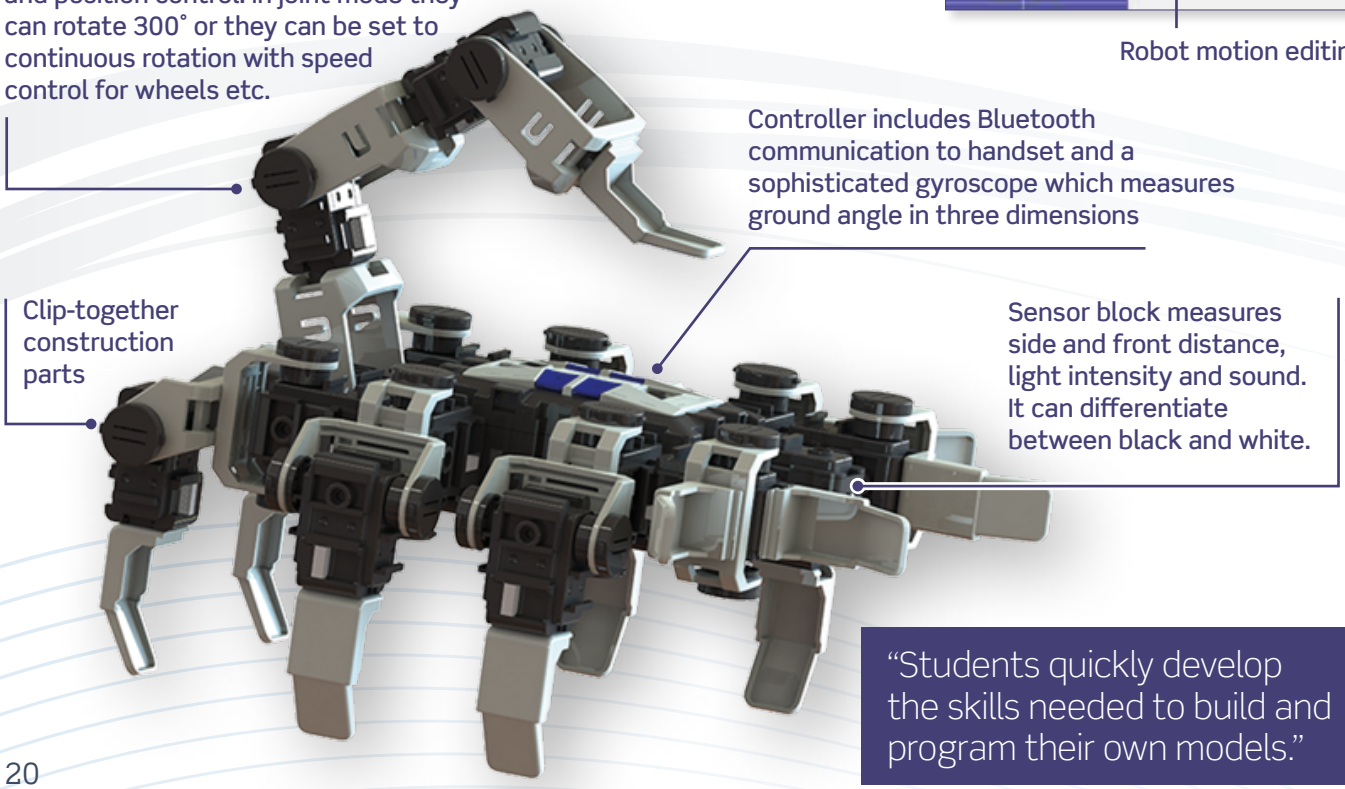
Typical practical tasks and topics include:

- Languages, machines and computation
- Testing and debugging
- A series of open ended design projects to allow students to get creative

Order as:

- 250-01 Educational Robotics Invention Kit





"Students quickly develop the skills needed to build and program their own models."

Engineering Construction Kit (220-01)

The Engineering Construction Kit includes simple, yet sophisticated, programming software to allow students to design flowchart programs to bring their models to life.

The Engineering Construction Kit is used to help students develop solutions to a range of practical real-world problem-solving tasks and activities within a classroom or lab environment.

Typical practical tasks and topics include:

- Design a railroad crossing control system
- Design automated agricultural machines
- Design mobile robots

Order as:

- 220-01 Engineering Construction Kit

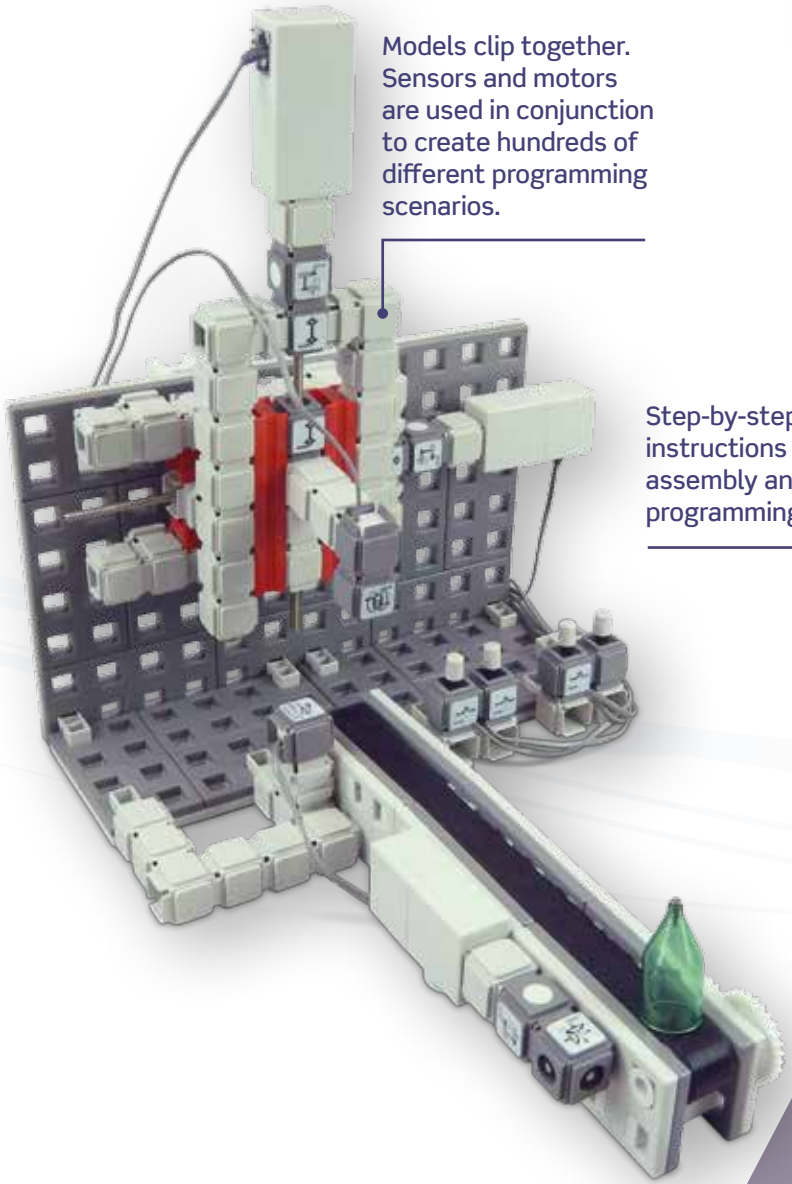
429-piece construction set

Sensors and switches

Motors

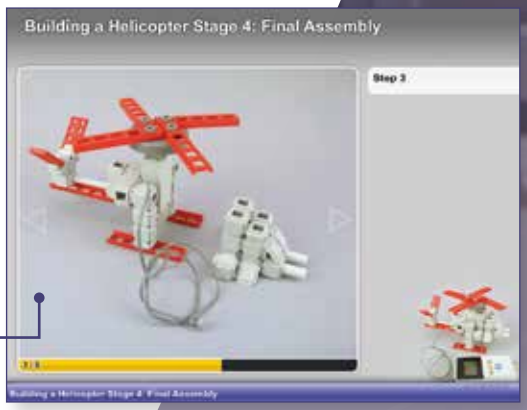
Controller

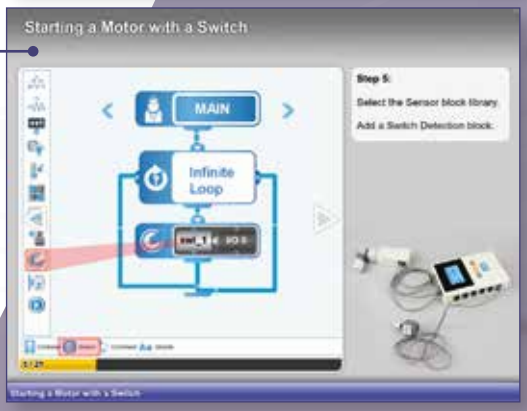
Gearboxes



Models clip together. Sensors and motors are used in conjunction to create hundreds of different programming scenarios.

Step-by-step instructions for assembly and programming





Research, Design and Technology
Hardware

Green Energy in Buildings Trainer (122-01)

The Green Energy in Buildings package offers a resource that puts a model home into the classroom.

Typical practical tasks and topics include:

- Investigating energy use in buildings
- Home wind turbines
- Solar electric systems
- Energy for heating buildings
- Solar water heating
- Insulation and glazing performance
- Heat pump principles

Order as:

- 122-01 Green Energy in Buildings Trainer

Digital content

Onscreen interface

Sustainable Energy Teaching Set (100-00)

Practically investigate alternative energy production techniques. This resource is supplied with a curriculum manual CD containing practical tasks and activities.

Order as:

- 100-00 Sustainable Energy Teaching Set

Teaching set includes:

- 100-01 Sustainable Energy Production Trainer
- 100-02 Sustainable Energy Production Student Resource Pack x12

INCLUDES UNIQUE SIMULATION SOFTWARE

Structures and Materials Teaching Set (121-00)

The Structures and Materials package offers student activities to investigate the science and technology behind the built environment.

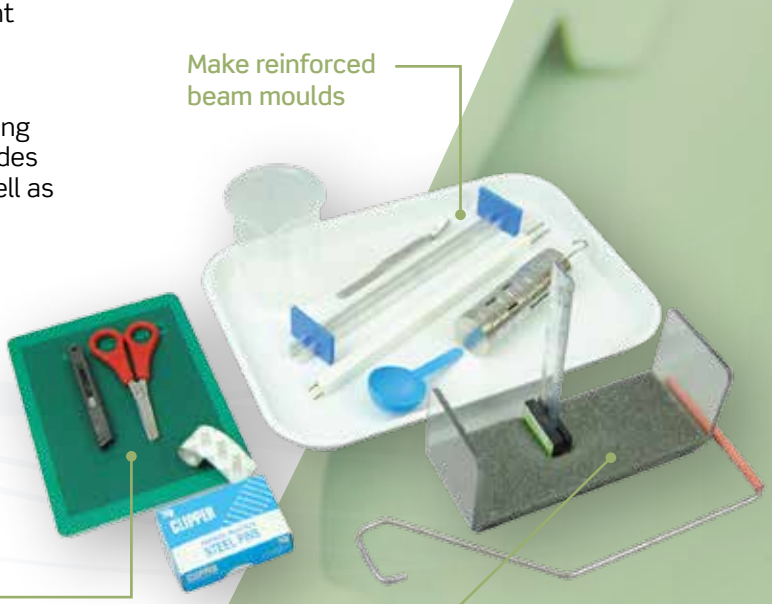
Explore beam designs and perform destructive testing on them to analyse their materials and design. Includes a CD with theory and practical lesson content, as well as tutor support materials.

Order as:

- 121-00 Structures and Materials Teaching Set

Teaching set includes:

- 121-01 Structures and Materials Student Resource Packs (x12)
- 121-02 Structures and Materials Class Consumables Pack (x1)



Research, Design and Technology
Hardware

3D Rapid Prototyping Machine (255-01)

Design and print additional components for ERIK or the Engineering Construction Kit. A dual printhead allows you to build designs in two colours simultaneously.

Includes FlashPrint software, 2x filament spools and a 3D printing tool box packed with useful items such as tweezers, glue, SD card and scraper.

Order as:

- 255-01 3D Rapid Prototyping Machine

"A 3D printer shouldn't be limited to building simple cubes and spheres. With our 3D printer, anything you imagine can become a physical reality that you can touch, hold and feel. Let your creativity flourish - however sophisticated or wild your designs may be."

Injection Moulding Trainer (350-01)

This trainer offers a classroom-based resource for investigating the techniques used to create thermo-plastic products. Students will see how a good grasp of materials science is needed to select appropriate materials and methods for production.

Typical practical tasks and topics include:

- Investigate the moulding process
- Investigate the causes of mould flash and shrinkage
- Research tools and fabrication processes used in manufacturing
- Compare costs of differently designed moulded parts
- Design, prototype, test and evaluate a door knob

Order as:

- 350-01 Injection Moulding Trainer

INCLUDES UNIQUE SIMULATION SOFTWARE

Basic Electricity Trainer (140-01)

The Basic Electricity Trainer offers investigation into fundamental electrical circuits and components using a robust self-contained hardware unit. Topics include:

- Electric Current
- Voltage
- Resistance
- Magnetism
- Motors
- Transformers

INCLUDES UNIQUE SIMULATION SOFTWARE

Order as:

- 140-01 Basic Electricity Trainer

Research and Design Teaching Set (150-00)

Students can use this teaching set to measure impact crash tests of vehicles protected by their crumple zone designs.

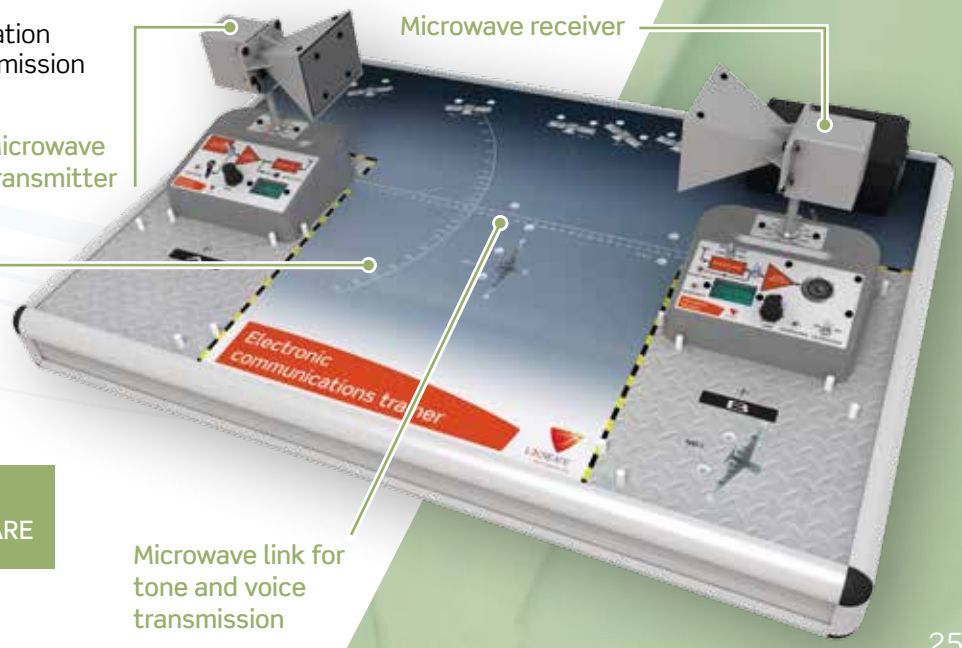
Order as:

- 150-00 Research and Design Teaching Set (includes 150-01 Mass Transit System Trainer and 150-02 Research and Design Consumables Pack)

INCLUDES UNIQUE SIMULATION SOFTWARE

Electronic Communications Trainer (200-01)

Investigate microwave communication technology, focusing on the transmission and reception of information.



Order as:

- 200-01 Electronic Communications Trainer

INCLUDES UNIQUE SIMULATION SOFTWARE

Research, Design and Technology
Hardware

A collection of hardware kits focused on Science for Engineers

Physics Apparatus Kit (511-01)

This kit can be used as a general physics classroom apparatus resource. It can be used on its own for a number of practical science lessons, but it can also be used in conjunction with other kits to perform a larger range of physics experiments.

Force and Energy Kit (511-02)

Explore more advanced aspects of force and energy. Topics covered include:

- Energy transformations
- Newton's laws of motion
- Work and energy

Motion Kit (511-03)

Specialised dynamics track that can be used to demonstrate and investigate motion. Topics covered include:

- Velocity
- Force and momentum
- Laws of motion

Sound and Resonance Kit (511-04)

Specialist equipment for the investigation of sound and resonance, including an oscillating platform to explore resonant frequency. Some tasks require data logging equipment.

Electricity and Magnetism Kit (511-05)

Explore electrical and electromagnetic science. Topics covered include:

- Conductors and insulators
- Solar power
- Electrostatics

Fluid Properties Kit (511-06)

Investigate fluids and their associated properties, including viscosity and capillarity action. Topics covered include:

- Surface tension
- Viscosity

Light Rays Kit (511-07)

This kit uses a bright white LED light rays box to allow learners to experiment with light rays without darkening the room. Topics include:

- Reflection and refraction
- Shadows
- Lenses and prisms

Measurement Kit (511-08)

Introduce the concepts and skills associated with scientific measurement. Topics covered include:

- Measurement
- Density of liquids
- Density of solids
- Errors and tolerance

Forces as a Vector Kit (511-09)

Investigate and experiment with vectors. Use the forces board to resolve forces into their vertical and horizontal components.

- Angular forces
- Inclined planes
- Vectors

Chemistry Experiment Kit Complete (512-00)

The set includes:

- 512-01 - Chemistry Apparatus Kit
- 512-02 - Chemistry Fundamentals Kit
- 512-03 - Mixtures and Solubility Kit
- 512-04 - Electrolysis of Liquids Kit
- 512-05 - Chemistry Simulation Software

Scientific Enquiry and Problem Solving Kit (511-10)

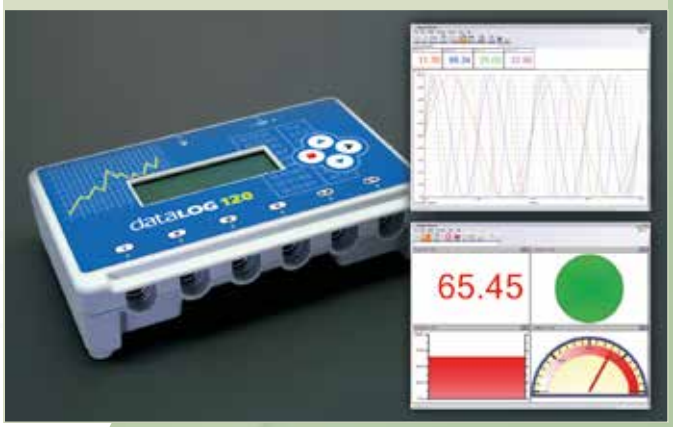
Investigate scientific design and the processes involved in designing and conducting an experiment.

- Designing a solution
- Designing experiments
- Conducting experiments

Data Logging Kit Complete (520-00)

The set includes:

- Logger and Software
- Colorimeter
- Multirange Light Sensor
- Forcemeter Sensor
- Heart Rate Sensor
- Light gate x2
- Magnetic Field Sensor
- Motion Sensor
- Sound Sensor
- Temperature Sensor x2



Electronics
Hardware

Electronic Circuits Trainer Teaching Set (450-00)

The Electronic Circuits hardware and resource packs can be used for class demonstrations as well as offering student activities either individually or in small groups. The equipment included will quickly turn any classroom into an electronics laboratory.

Typical practical tasks and topics include:

- Component identification
- Circuit construction on a range of prototyping systems
- Analogue and digital systems
- Circuit testing and fault finding

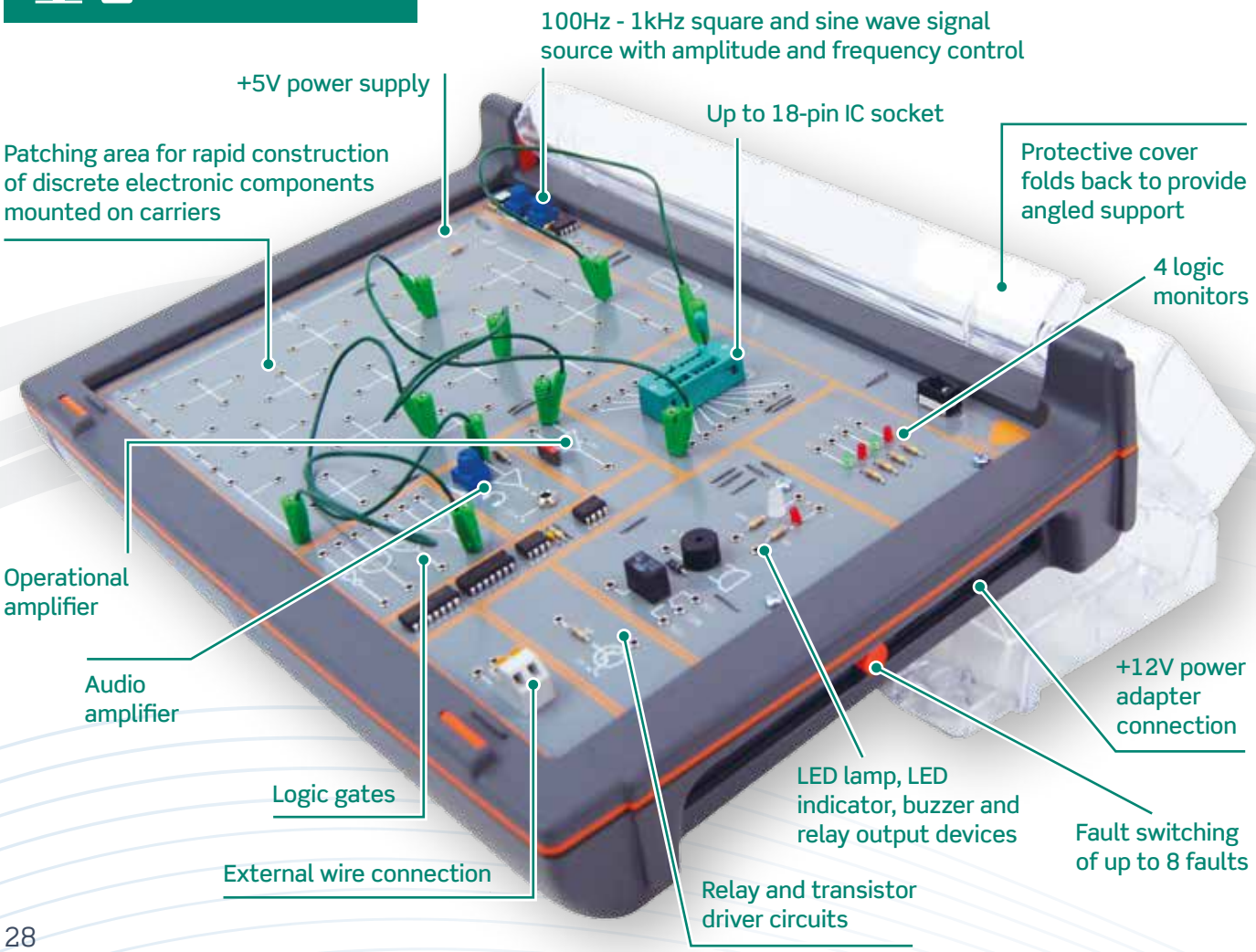
INCLUDES UNIQUE SIMULATION SOFTWARE

Order as:

- 450-00 Electronic Circuits Trainer Teaching Set

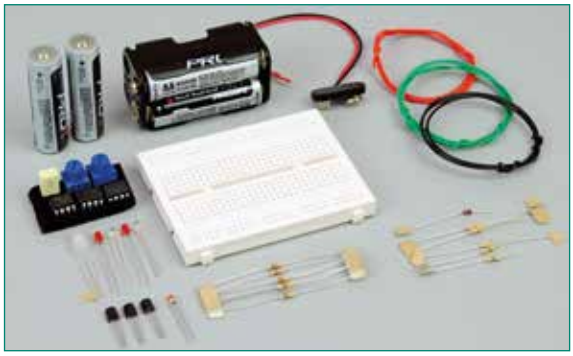
Teaching Set includes:

- 450-10 Electronic Circuits Trainer
- 450-02 Electronic Circuits Student Resource Pack (12 packs for 24 students working in pairs)
- 450-03 Electronic Circuits Class Consumables Pack (24 Students)
- 450-04 Circuit Design and Simulation Software (Initial 5 Student Licence)
- 450-05 Circuit Design and Simulation Software (Additional 5 User) x4



Electronic Circuits Student Resource Pack (450-02)

The Electronic Circuits Student Resource Pack is designed to allow students to develop breadboarding techniques. The components supplied are selected for a range of exciting design and build projects.



Typical topics and projects include:

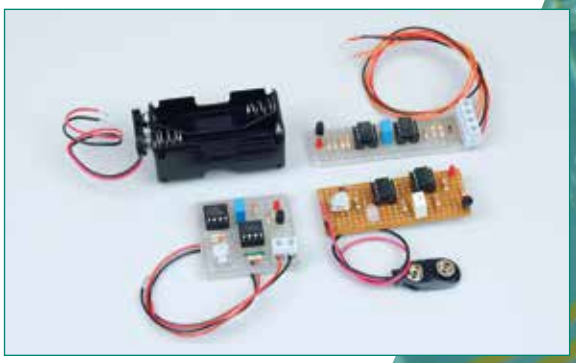
- Building on breadboard – automatic light circuit
- Building on breadboard – anti-theft device

Order as:

- 450-02 Electronic Circuits Student Resource Pack

Electronic Circuits Consumable Pack (450-03)

The Electronic Circuits Consumables Pack offers a set of project boards (PCB and stripboard) and the components required for practical electronics projects, all neatly contained in a plastic storage box.



Typical topics and projects include:

- Building Circuits on Printed Circuit Board (PCB)
- Continuity Tester
- Car Light Level Alarm

Order as:

- 450-03 Electronic Circuits Consumable Pack

Electronic Circuits Design and Simulation Software (450-04)

This software offers learners the opportunity to create and test circuits on-screen, before building real circuits or generating PCB projects using the incorporated utilities.

Order as:

- 450-04 Electronic Circuits Design and Simulation Software (Initial 5 Users)

Also available:

- 450-05 Electronic Circuits Design and Simulation Software (Additional 5 Users)

Electronics
Hardware

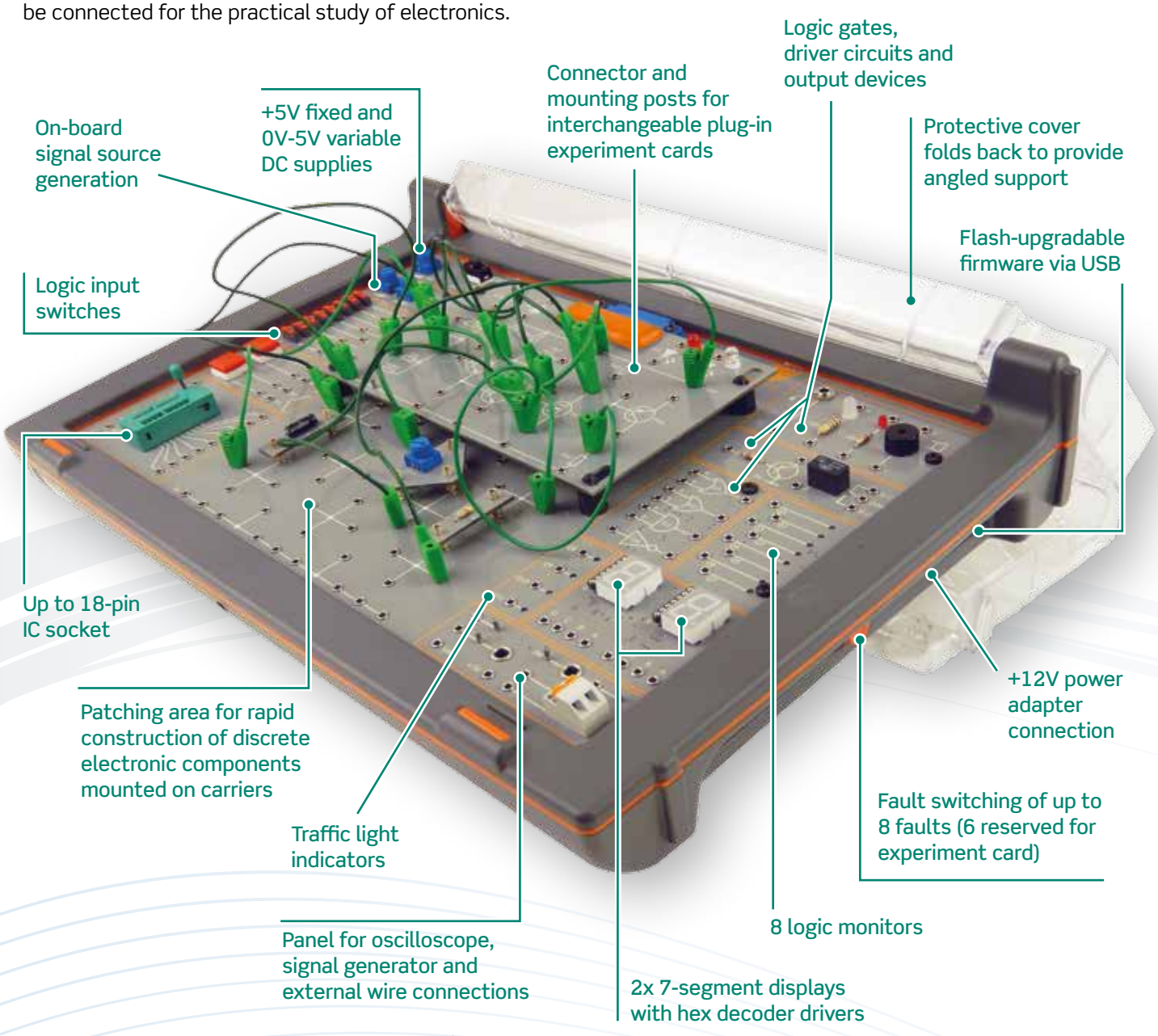
Electronics Study Trainer (320-00)

The Electronics Study Trainer provides the basis for a practical resource that introduces students to core electronics and electronic systems through a wide range of practical activities.

The study trainer allows a range of experiment cards to be connected for the practical study of electronics.

Order as:

- 320-00 Electronics Study Trainer



Complete Electronics Workstation (320-10)

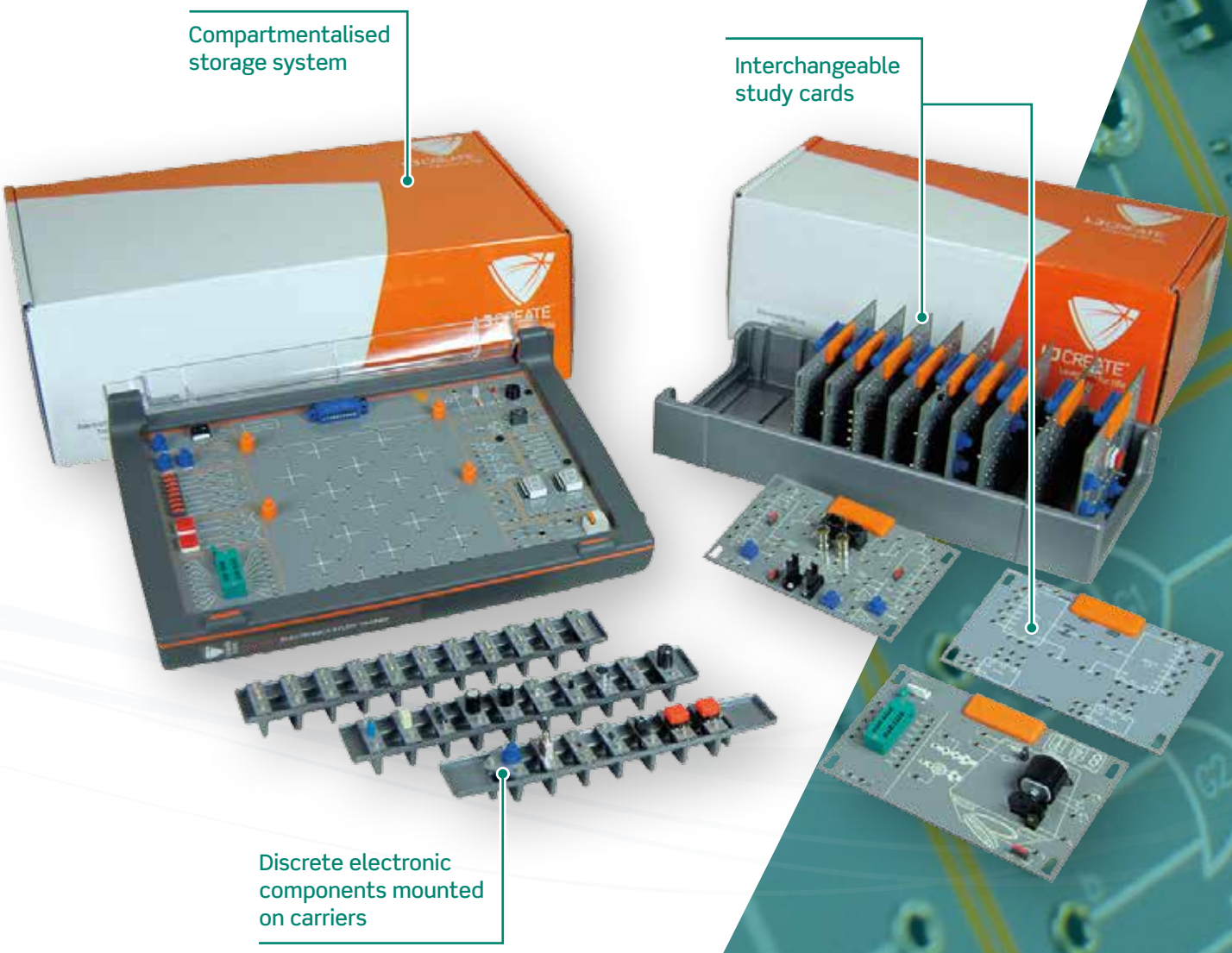
The core electronics series allows the practical study of a wide range of electronics subjects, including DC and AC circuits, semiconductors, analogue and digital systems, telecommunications and microcontrollers.

The series comprises an electronics study trainer and component set, and a range of plug-in experiment cards. The unique design of the trainer includes a heavy duty casing with transparent protective cover.

When in use, the cover folds back to provide an angled support for the unit. With the cover closed, trainers become stackable for easy storage.

Order as:

- 320-10 Complete Electronics Workstation (includes 320-00 to 320-61)



Electronics
Hardware

Our completely re-designed core electronics series is a perfect blend of component-based and systems training for intermediate (Level 1, 2 and 3) electronics students.

- Patch discrete components quickly and easily
- Add an interchangeable study card for more complex circuits
- Or combine the two for even more flexibility!
- Controlled troubleshooting faults that really test circuit understanding

Electronic Systems Card (320-01)

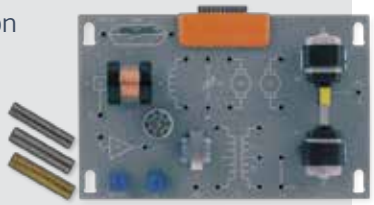
Typical practical tasks and topics include:

- Darlington pair and FET investigation
- Thyristor investigation
- Automatic lighting project
- Baby alarm project

Electromagnetism Card (320-14)

Typical practical tasks and topics include:

- Reed switch operation
- Hall effect investigation
- Transformer power and efficiency
- DC motor-generator



Diodes and Transistors Card (320-21)

Typical practical tasks and topics include:

- Voltage stabilisation using a zener diode
- NPN transistor as a voltage amplifier
- FET operation
- Testing diode and transistor circuits

Transistor Amplifiers Card (320-22)

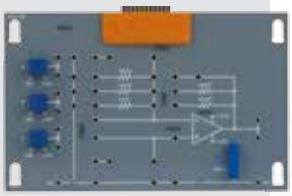
Typical practical tasks and topics include:

- Build and test Class A, B, AB and C transistor amplifiers
- Crossover distortion
- Effects of feedback in a transistor amplifier circuit

Operational Amplifiers Card (320-31)

Typical practical tasks and topics include:

- Voltage comparator circuits
- Building and testing inverting & non-inverting amplifiers
- High frequency performance of an operational amplifier



Analogue Integrated Circuits Card (320-32)

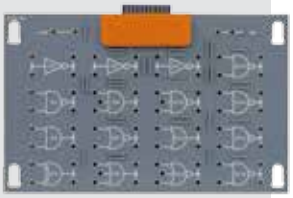
Typical practical tasks and topics include:

- Comparing linear and switch mode voltage regulators
- Testing a switched capacitor filter
- Investigating the operation of a phase locked loop

Combinational Logic Card (320-41)

Typical practical tasks and topics include:

- Investigating logic gates
- Constructing truth tables
- Building EXOR gates from other gates
- Equivalent logic circuits



Please note: these circuit cards are used in conjunction with 320-00 Electronics Study Trainer

Sequential Logic Card (320-42)

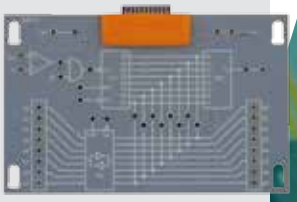
Typical practical tasks and topics include:

- D-type flip-flop
- J-K flip-flop
- Binary counter operation
- Frequency division
- Shift register operation

A/D-D/A Digital Systems Card (320-43)

Typical practical tasks and topics include:

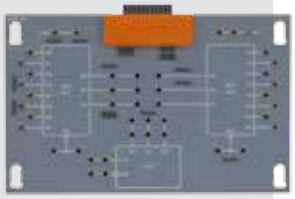
- Investigating a D/A converter
- Building and testing an A/D converter
- Tri-state devices
- Testing and fault-finding A/D and D/A systems



Encoder/Decoder Digital Systems Card (320-44)

Typical practical tasks and topics include:

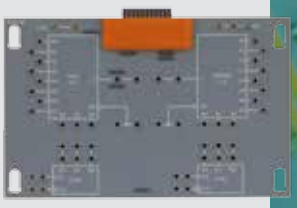
- Investigate digital encoders
- Decoding the output from a binary counter
- Building and testing an encoder-decoder system

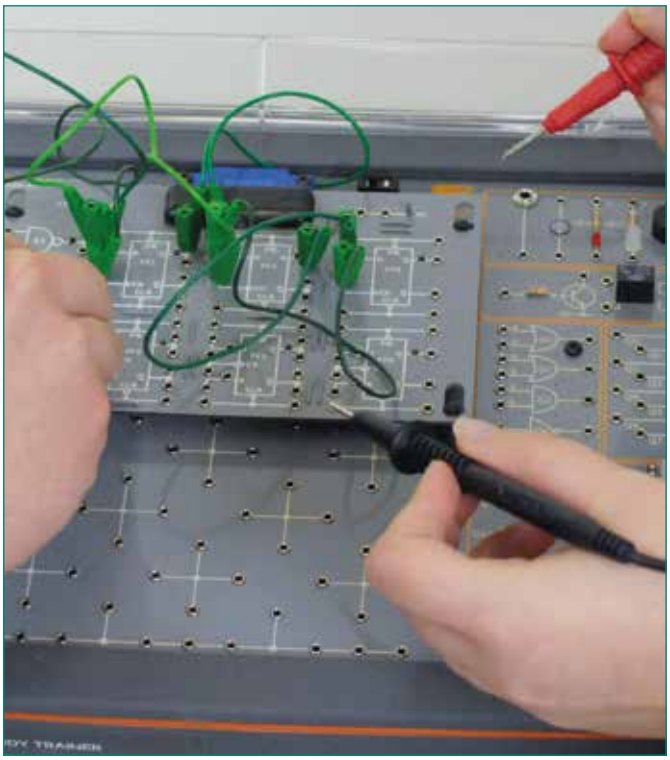


Multiplexer/Demultiplexer Digital Systems Card (320-45)

Typical practical tasks and topics include:

- Scanning multiplexer inputs using a binary counter
- Building and testing multiplexers/demultiplexers
- Clocking & Synchronization





Electronic Communications Systems Card (320-51)

Typical practical tasks and topics include:

- AM & Optical transmission
- Digital data transmission
- Simplex and duplex modes
- Transmission protocols

PIC Programmer and Applications Card (320-61)

Typical practical tasks and topics include:

- Sensors and actuators
- Controlling I/O port lines
- Performing arithmetic and logical operations
- Using sub-routines

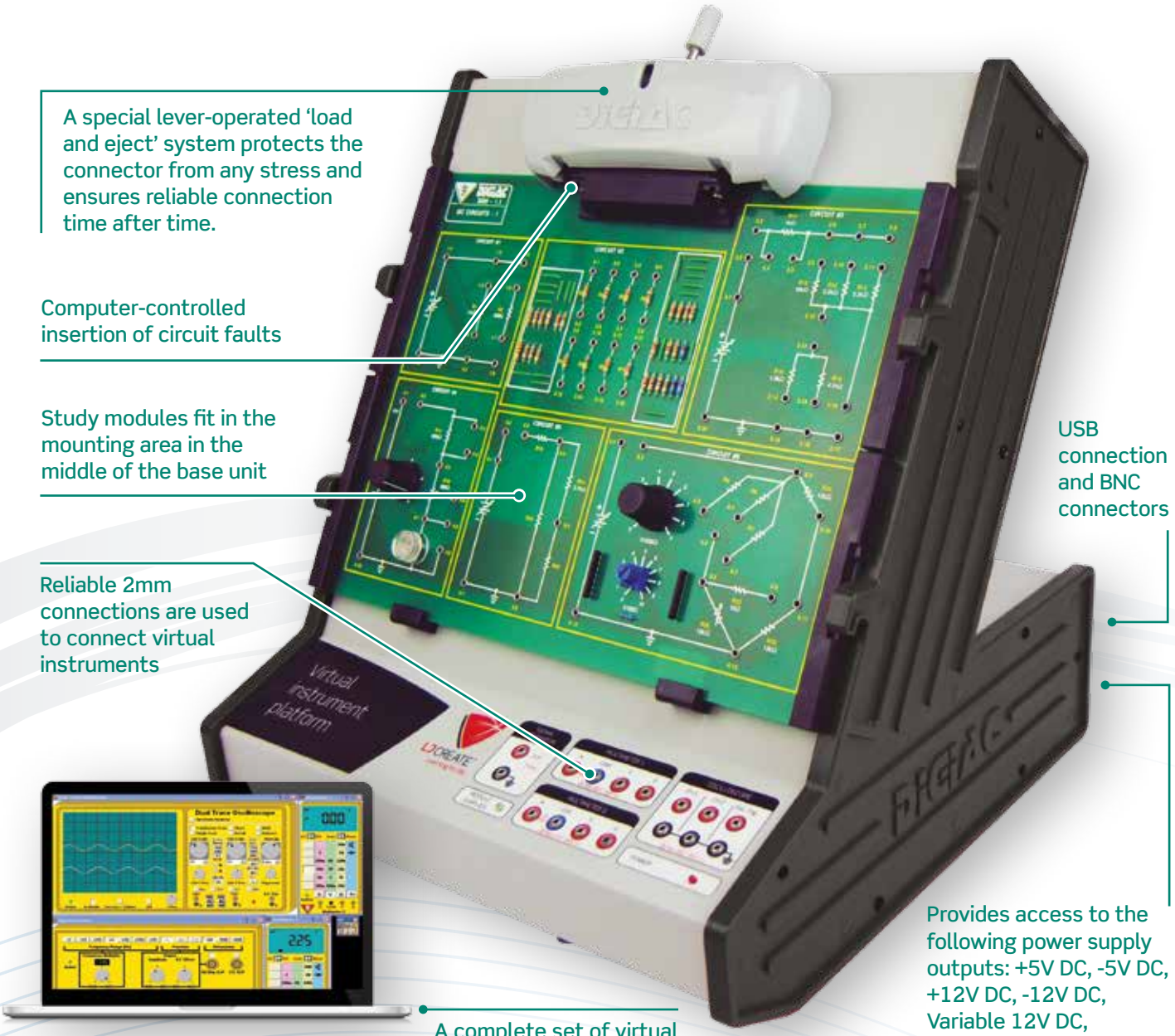
Electronics
Hardware

Advanced Electronics Experiment Platform with Virtual Instrumentation (300-02)

This unit provides a full set of virtual instruments and accommodates all study modules from the advanced electronics range. The unit is controlled by a PC through a USB port.

Order as:

- 300-02 Advanced Electronics Experiment Platform with Virtual Instrumentation



Advanced Electronics Experiment Platform (300-01)

This unit provides power supplies and connection facilities for the complete range of advanced electronics study modules. It can operate either in standalone mode, or via a USB interface to a host PC. Facilities are provided for inserting circuit faults into study modules.

Order as:

- 300-01 Advanced Electronics Experiment Platform

Virtual Instrumentation Unit (300-03)

This resource packages a range of test equipment neatly into one small unit that interfaces with a PC.

The on-screen applications mimic traditional equipment and allow the user to copy the screens showing measured values and waveforms. This is great for evidence gathering, as scope patterns and scope setups can be pasted directly into documents.

Order as:

- 300-03 Virtual Instrumentation Unit

Breadboard Module (300-04)

The breadboard module allows students to build a wide variety of electronic circuits using discrete components. In addition to a large, solderless breadboard patching area, the board provides a range of built-in support circuitry.

Order as:

- 300-04 Breadboard Module

Test Instruments

300-11 Digital Multimeter
300-12 Autoranging Digital Multimeter
300-13 Digital Storage Oscilloscope
300-15 Function Generator
300-16 25MHz Virtual Oscilloscope
300-17 50MHz Virtual Oscilloscope

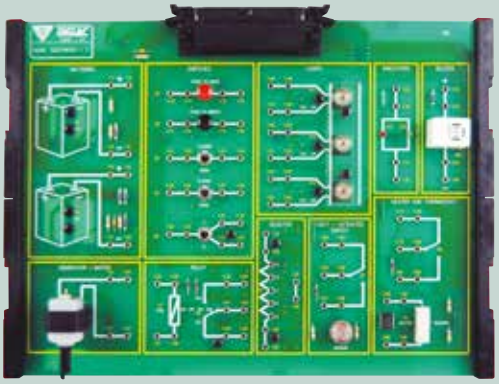
Electronics
Hardware

Please note: all study modules include switched faults for troubleshooting tasks

Introduction to Electricity Study Module (301-01)

Typical practical tasks and topics include:

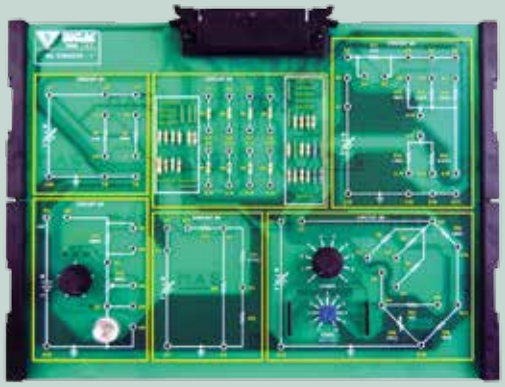
- Symbols and switches
- Magnetism and relays
- Measuring electricity
- Motors and generators



DC Circuits Study Module (301-11)

Typical practical tasks and topics include:

- DC circuits
- Ohm's Law
- Resistor colour coding
- Variable resistor characteristics
- The Wheatstone Bridge



AC Circuits Study Module (301-12)

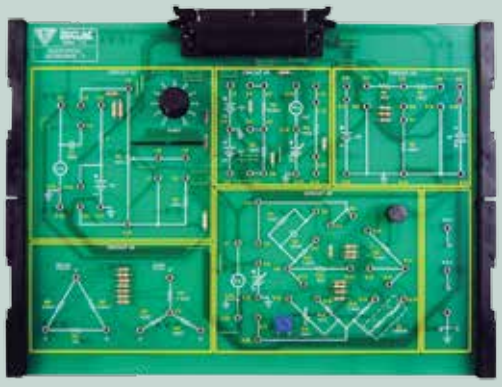
Typical practical tasks and topics include:

- AC waveforms
- Capacitive inductance
- RC circuits
- Transformer principles
- Determining phase shift for a capacitor

Electrical Networks Study Module (301-13)

Typical practical tasks and topics include:

- Electrical networks and theorems e.g.Thevenin's and Norton's theorems
- Superposition and star delta transformation
- DC and AC bridges



Electromagnetic Devices Study Module (301-14)

Typical practical tasks and topics include:

- Principles of magnetism and electromagnetism
- Investigate pull-in voltage for a solenoid
- Determine EMF in a generator armature

Semiconductors 1 Study Module (302-21)

Typical practical tasks and topics include:

- Plot the transfer characteristic for a bipolar junction transistor
- The transistor as a switch
- Measure quiescent and dynamic voltages for an emitter follower (CC) amp to determine the gain

Semiconductors 2 Study Module (302-22)

Typical practical tasks and topics include:

- Bipolar junction transistors
- Field effect transistors
- JFET parameters

Operational Amplifiers Study Module (302-31)

Typical practical tasks and topics include:

- Determine the action of a zero crossing detector
- Observe the operation of a comparator circuit
- Measure the offset voltage for a non-inverting amplifier

Electronics
Hardware

Please note: all study modules include switched faults for troubleshooting tasks

Optoelectronic Devices Study Module (303-24)

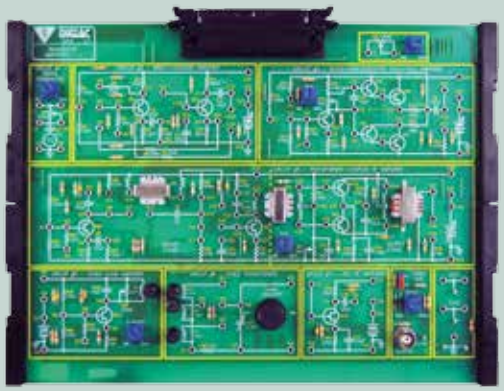
Typical practical tasks and topics include:

- Measure power dissipation for red and green LEDs
- Interpret I - V curve for an LED
- Identify the operation of a bar graph display

Transistor Amplifiers Study Module (303-25)

Typical practical tasks and topics include:

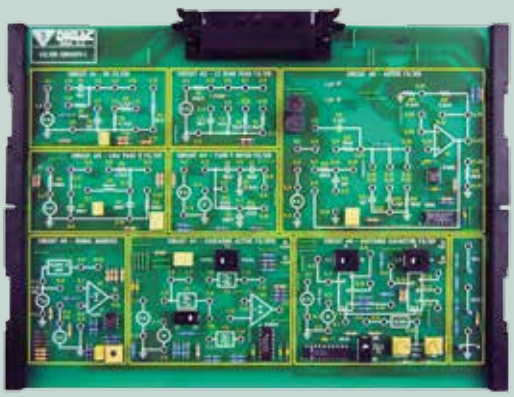
- Determine values to be used for transistor amplifier circuit components
- Indirect coupling in a double-tuned amplifier
- Tuned load amplifiers



Filter Circuits Study Module (303-32)

Typical practical tasks and topics include:

- Identify advantages of using the logarithmic scale for amplitude and frequency
- Determine cut-off frequency for a low-pass filter
- Recognize the effect of a damping resistor



Oscillators Study Module (303-33)

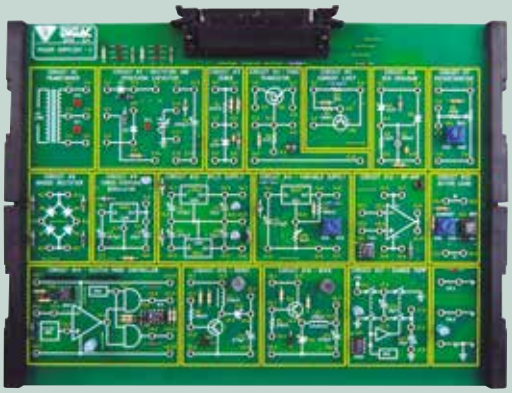
Typical practical tasks and topics include:

- Measure the oscillation frequency & diagnose faults for RC and LC oscillators
- Measure voltages in a working oscillator circuit
- Measure capacitor charging time

Power Supplies Study Module (303-34)

Typical practical tasks and topics include:

- Determine output resistance, ripple amplitude and percentage ripple of a power supply
- Determine the efficiency and regulation of a variable supply regulator



AC Power Study Module (305-17)

Typical practical tasks and topics include:

- Measure phase voltages, phase-phase voltages, and phase relationships of a three-phase supply
- Identify the principle of an inverter
- Measure voltages in balanced and unbalanced delta/wye connected circuits

Power Electronics 1 Study Module (305-23)

Typical practical tasks and topics include:

- Determine the base-emitter voltage and current gain of a power transistor
- Identify waveforms in an audio power amplifier
- Measure the gate current of a Triac

Power Electronics 2 Study Module (305-26)

Typical practical tasks and topics include:

- Determine the firing angle of an SCR rectifier
- Troubleshoot a fault in an SCR bridge circuit
- Investigate the operation of the Jones Commutator with resistive and inductive loads

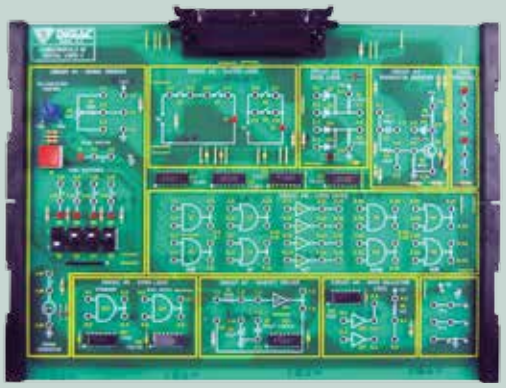
Electronics Hardware

Please note: all study modules include switched faults for troubleshooting tasks

Fundamentals of Digital Logic Study Module (304-41)

Typical practical tasks and topics include:

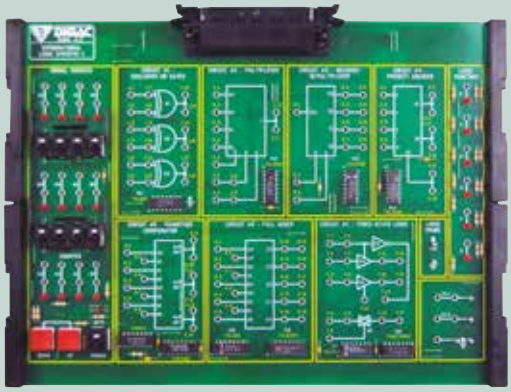
- Measure voltages from switched logic sources
- Identify the allowable voltage ranges for TTL inputs and outputs
- Measure voltage levels in DTL circuits



Combinational Logic Study Module (304-42)

Typical practical tasks and topics include:

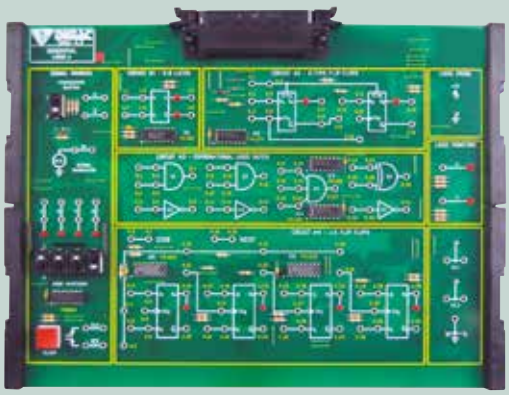
- Determine from observations the logic states for encoder and decoder circuits
- Diagnose faults in decoder circuits
- Deduce the operation of a 4-bit full adder



Sequential Logic Study Module (304-43)

Typical practical tasks and topics include:

- Determine the truth table of an S-R latch
- Observe the operation of a shift register
- Diagnose faults in J-K based counter and flip-flop circuits and D-type flip-flop circuits



Digital Systems Study Module (304-44)

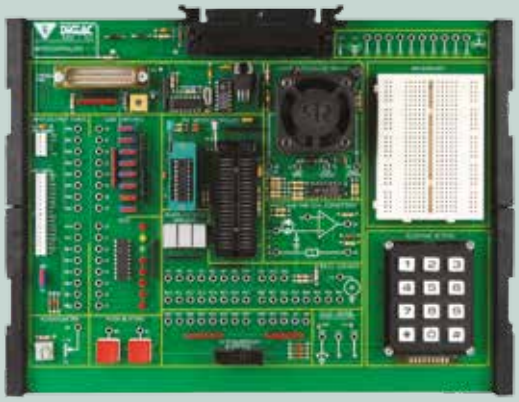
Typical practical tasks and topics include:

- Observe the operation of an analogue switch, a monostable and a bistable circuit
- Determine the output from an integrator for square wave and constant voltage inputs

PIC 3000 Microcontroller Study Module (316-01)

Typical practical tasks and topics include:

- PIC microcontrollers
- Interrupts and delay routines
- Keyboard scanning and display driving
- Sound generation



PIC 32 Extension Kit (316-02)

This pack extends the capabilities of the 316-01 PIC 3000 Microcontroller Study Module to include 32-bit microcontrollers.

- Introduction to C programming
- Program debugging

Microcontroller Applications Board (316-35)

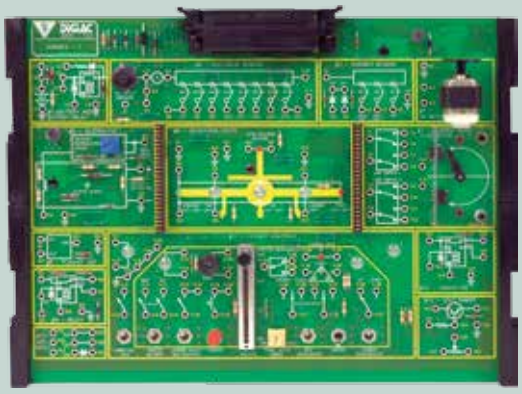
This pack extends the capabilities of the 316-01 PIC 3000 Microcontroller Study Module.

- Piezo sounder
- Potentiometer
- Motor
- Optical sender/receiver
- D-A and A-D converters

Avionics 1 Study Module (312-01)

Typical practical tasks and topics include:

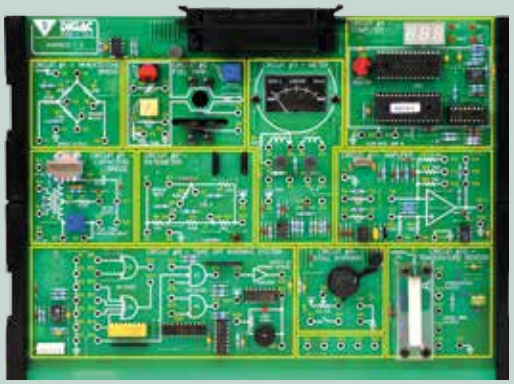
- Identify the electrical power supply systems that are available on the various Cessna aircraft
- Investigating the operation of a rheostat
- Investigating a flap control system



Avionics 2 Study Module (312-02)

Typical practical tasks and topics include:

- Stall warning systems
- Take off warning systems
- Temperature warning systems incorporating nickel wire sensors



Aligned to qualifications (such as the BTEC Level 3 Nationals - 2016)

Our unique blend of lessons and hardware have been linked to the learning aims of the more popular qualifications. Below is just **one example** - showing where our hardware aligns to the new Level 3 Engineering BTECs.

Level 3 Units (Start Sept 2016)		100-00 Sustainable Energy Production	121-00 Structures and Materials	122-01 Green Energy in Buildings	140-01 Basic Electricity Trainer	207-00 Analogue & Digital Motor Control	217-50 Transducers, Instr. and Control	217-60 Data Acquisition of Ctrl. Systems	220-01 Engineering Construction Kit	240-01 Robotics Trainer	250-01 Educational Robotics Kit	255-01 3D Rapid Prototyping Machine	260-01 Mechanisms Trainer	270-01 Electro-Pneumatics Trainer	280-01 Hydraulics Trainer	290-01 Industrial Control System	290-02 Siemens S7 1200 + Step 7 PLC	291-01 PLC Trainer	300 Series - Advanced Electronics	312-00 Advanced Avionics Study Mods.	311-00 Microcontroller Study Modules	320-10 Electronics Study Trainer & Cards	350-01 Injection Moulding Trainer	450-04 Electronic Circuits Design Sim.	450-10 Electronic Circuits Trainer	511-01 to 511-10 Physics Experiment Kit	512-00 Chemistry Experiment Kit	520-00 Data Logging Kit Complete	ELE1-AL Electrical/Electronics Program	EXS-AL Exploring STEM	WWS-AL Working with STEM
01	Engineering Principles		●		●								●						●			●		●	●	●		●	●	●	●
02	Delivery of Eng. Processes Safely as a...																														●
03	Engineering Product Design and Man...								●		●	●	●										●			●				●	●
04	Applied Commercial and Quality Princ...																														●
05	A Specialist Engineering Project								●		●																				●
06	Microcontroller Systems for Engineers										●								●		●	●							●	●	●
10	Computer Aided Design in Engineering																														●
11	Engineering Maintenance and Cond...						●	●																		●		●			●
12	Pneumatic and Hydraulic Systems													●	●											●				●	●
13	Welding Technology																														●
14	Electrical Installation of Hardware and...																														●
15	Electrical Machines					●																	●								●
16	Three Phase Electrical Systems																		●										●		●
17	Power and Energy Electronics					●													●			●							●		●
18	Electrical Power Distribution and Tra...	●																											●	●	●
19	Electronic Devices and Circuits																		●			●							●		●
20	Analogue Electronic Circuits																		●			●							●		●
21	Electronic Measurement and Testing...																		●			●							●		●
22	Electronic PCB Design and Manufacture																												●		●
23	Digital and Analogue Electronic Systems																		●			●							●		●
24	Maintenance of Mechanical Systems												●																	●	●
25	Mechanical Behaviour of Metallic Mat...																														●
26	Mechanical Behaviour of NonMetallic...																										●			●	●
27	Static Mechanical Principles in Practice		●																							●				●	●
28	Dynamic Mechanical Principles in Pra...																									●		●		●	●
29	Principles and Applications of Fluid...													●	●											●				●	●
30	Mechanical Measurement and Inspec...						●	●																		●				●	●
31	Thermodynamic Principles and Practice			●																										●	●
32	Computer System Principles and Pra...								●																					●	
33	Computer Systems Security																		●		●	●									●
34	Computer Systems Support and Per...																														●
35	Computer Programming								●	●	●										●	●								●	●
36	Programmable Logic Controllers															●	●	●													●
37	Computer Networks																													●	●
39	Modern Manufacturing Systems																														●
40	Computer Aided Manufacturing and...																														●
41	Manufacturing Secondary Machining...																														●
42	Manufacturing Primary Forming...																							●							●
43	Manufacturing CNC Machining Pro...																														●
44	Fabrication Manufacturing Processes																														●
45	Additive Manufacturing Processes																														●
46	Manufacturing Joining, Finishing and...																														●
54	Aircraft Electrical and Instrument Sys...																		●	●											

Product index

Search the product codes on our website to find out more information...

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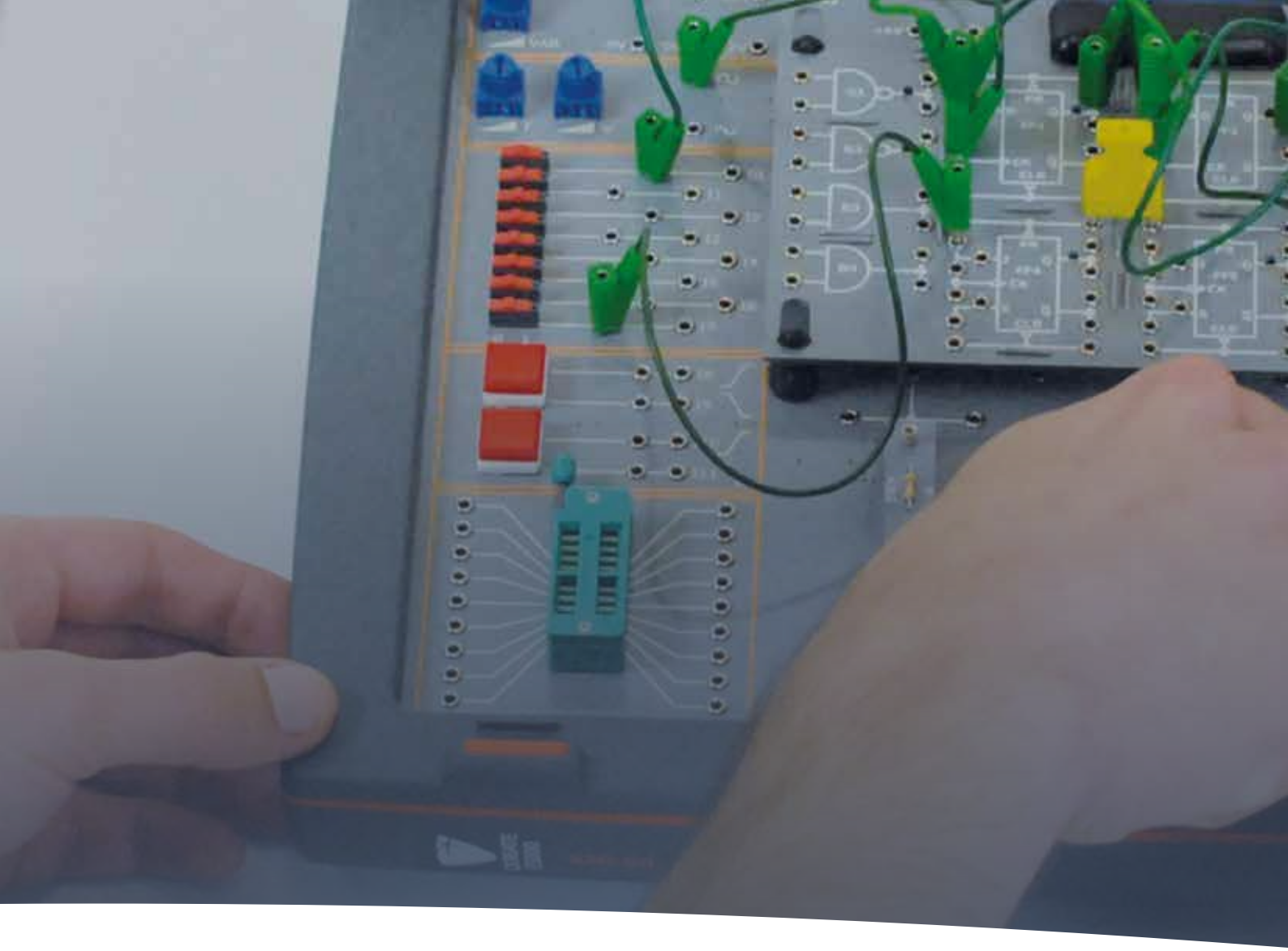

For more information on our range of learning resources, please contact:

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