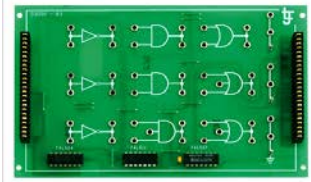
# Product Information Sheet

## Core Electronics Experiment Card Set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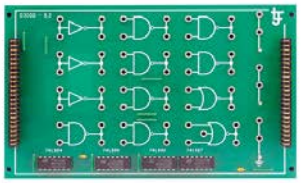
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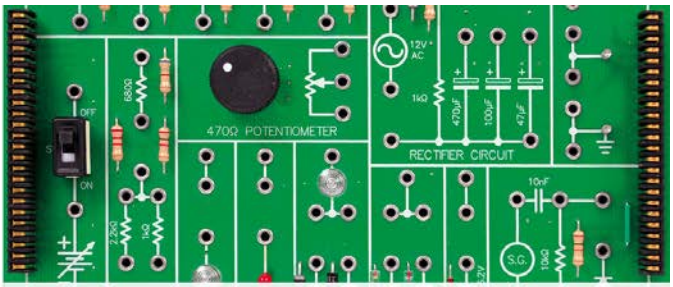

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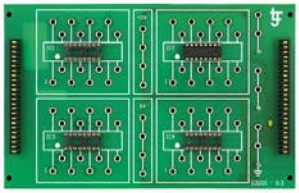
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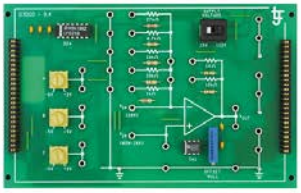
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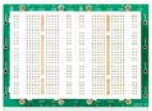
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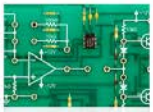
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This collection of Intermediate Electronics Experiment Cards provides practical learning activities to cover the range of core electronics topics

Each study card is designed to connect to the 409-01 Experiment Platform or to the 300-01/300-02 Advanced Electronics Experiment Platforms* as part of a modular electronics programme.

This set of practical resources is supplied with PDF manuals containing practical tasks and activities.

The set can also be used in conjunction with our optional cloud-based software, which offers online practical electronics tasks as well as interactive theory presentations, investigations, and assessments, which link directly to the practical activities carried out using this resource.

* Note: to connect to 300-01, 300-02, D3000 EXP or D3000 VIP2 you will also need a 409-02 Experiment Card Motherboard.

**Topics Include:**

- Transistor-Transistor Logic
- AND, OR, and NOT Gates
- NAND and NOR Gates
- Boolean Expressions and Simplification
- Karnaugh Maps
- The S-R Latch
- Exclusive-OR and Exclusive-NOR Gates
- Troubleshooting an Exclusive-NOR Gate
- Schmitt Trigger Circuits
- Decoder and Encoder
- Multiplexer and Demultiplexer
- Magnitude Comparator
- Adders
- Three-State Logic Circuits
- J-K Flip-Flop
- D-Type Flip-Flop
- Shift Registers
- Binary Counters
- Analog Switch
- Counters and 7-Segment Decoders
- The Operational Amplifier
- Inverting Amplifier
- Troubleshooting an Inverting Amplifier
- Unity Gain Voltage Follower
- Non-Inverting Amplifier
- Summing Amplifier
- Troubleshooting a Summing Amplifier
- The Basic DC Circuit
- Resistance and Ohm's Law
- Power in a Resistor
- Resistor Color Coding
- Resistor Troubleshooting
- Resistors Connected in Series and Parallel
- Kirchhoff's Laws
- Resistor Network Troubleshooting
- The Variable Resistor
- PN Junction Diode
- Troubleshooting a Diode Circuit
- AC Measurements
- Half-Wave Rectifier
- Troubleshooting a Half-Wave Rectifier
- The Zener Diode
- Capacitor Charging and Discharging
- Capacitor Charge Time
- Capacitor Operation on DC and AC Supplies
- Troubleshooting a Simple Capacitor Circuit
- CR Integrator
- Troubleshooting a CR Integrator
- Operating characteristics of an LDR and a thermistor
- Investigate the operation of an LDR and Thermistor
- Identify the operation of a simple transistor switch circuit
- Darlington pair and switching circuits
- Transistor switch circuits
- Troubleshoot a Darlington pair light-level alarm circuit
- Investigate a loaded voltage divider

# Product Information Sheet (Continued)

## Core Electronics Experiment Card Set

- Investigate a single transistor emitter follower
- Investigate a Darlington pair emitter follower
- Troubleshoot a Darlington pair emitter follower circuit
- Resistors on an AC Supply
- Capacitors on an AC Supply
- Troubleshooting a Capacitor Network
- Inductors on an AC Supply
- RC and RL Circuits on an AC Supply
- RLC Circuit on an AC Supply
- Testing Transistors
- Characteristics of an NPN Bipolar Transistor
- The Simple Transistor Amplifier
- Transistor Amplifier Biasing
- Troubleshooting a Common Emitter Amplifier
- Common Collector Amplifier (Emitter Follower)
- Silicon Controlled Rectifier
- Capacitor Commutation of an SCR Circuit
- AC Applied to an SCR
- UJT Oscillator
- UJT SCR Control
- Troubleshooting an AC Phase Control Circuit
- The Triac and Diac
- The Wheatstone bridge
- NPN on PNP transistors
- Differential amplifier
- JFET
- Analog switch
- Integrator switch logic
- Diode logic
- Multivibrators
- D/A and A/D converters
- Inverting Operational Amplifier
- Non-Inverting Operational Amplifier
- Amplifier Troubleshooting
- Amplifier Operation at High Frequency
- Other Amplifier Configurations
- Current Amplifiers
- Push-pull Amplifiers
- Power in Push-pull Amplifiers
- Power Amplifier Troubleshooting
- Construct simple Automatic Light Switch Systems
- Construct Switch State Detector Systems
- Construct Latching Switch Systems
- Investigate a BJT Driver
- Investigate a MOSFET Driver
- Investigate the operation of a Relay
- Investigate the operation of an Amplifier and Loudspeaker
- Investigate the operation of a 7-Segment Display
- Investigate the effect of varying voltage at the output of a potentiometer
- Recognise the nature of an analog signal
- Recognise the nature of a digital signal
- Identify simple analog-to-digital and digital-to-analog converters
- Investigate AND, OR, and NOT Gates for processing digital signals
- Investigate Comparators for processing analog signals to give digital signal outputs
- Investigate Voltage Amplifiers for processing analog signals
- Investigate Lighting/Temperature Failure Warning Systems
- Investigate Temperature/Time Switch Controller Systems
- Permanent Magnets
- The Electromagnet
- Electromagnetic Induction and the Solenoid
- The Transformer
- Transformer Troubleshooting
- DC Motors and Generators
- DC Motor Troubleshooting
- Relays
- Relay Troubleshooting

### Items Included:

- Fundamental Digital Electronics 1 (419-01)
- Fundamental Digital Electronics 2 (419-02)
- Further Digital Devices (419-03)
- Operational Amplifiers (419-04)
- Introduction to DC and AC Circuits (419-05)
- Capacitor Applications (419-06)
- Transducers and Transistors (419-07)
- AC Circuits and Bipolar Transistors (419-08)
- SCR Applications (419-09)
- Breadboard Circuits (419-10)
- Amplifier Fundamentals (419-12)
- Electronic Systems (419-14)
- Magnetic and Electromagnet Principles (419-20)
- CDROM with PDF Manuals for above
- Storage Cases for Above

### Other Items Required:

- 490-01 Experiment Platform
- Digital Multimeter
- Dual Trace Oscilloscope
- Function Generator

**or**

- 300-02 Advanced Electronics Experiment Platform
- 409-02 Experiment Card Motherboard

### General Information:

Packed Volume: 0.026 m3
Packed Weight: 4.5 kg

See individual module information sheets for more specific details.

**Order Code: 419-00**

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