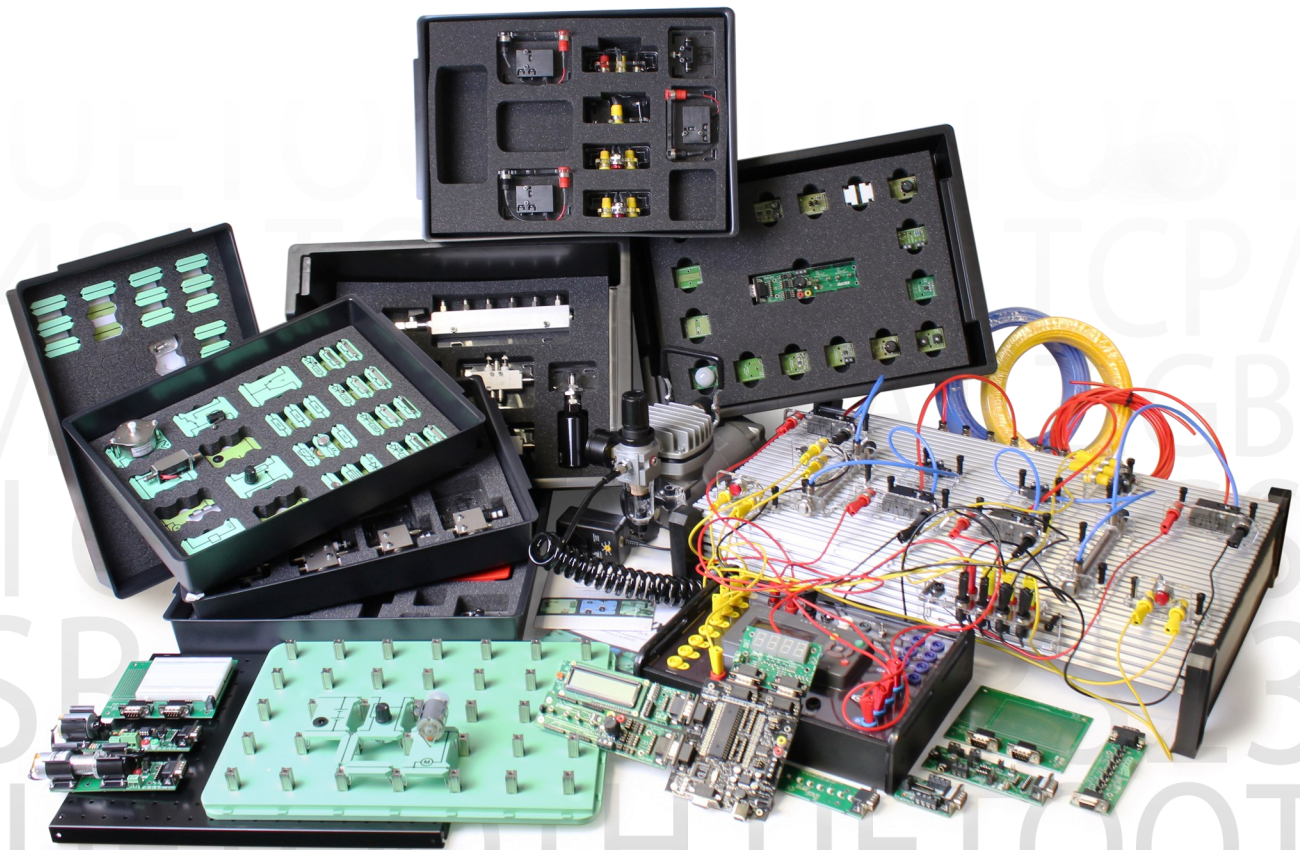


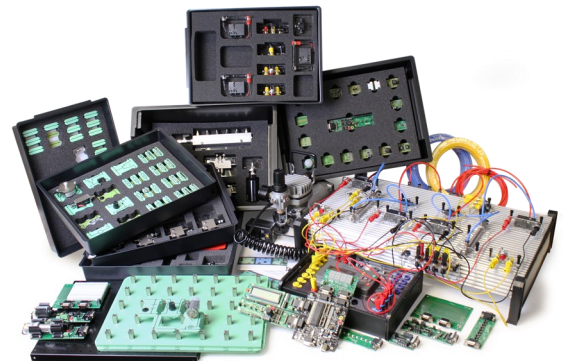
E BLOCKS

Mechatronics systems



Solution Description

This solution contains products from our Locktronics, E-blocks and Automatics ranges. The pack includes a wide variety of resources suitable for studying mechatronics using three types of control system: a PIC microcontroller, a micro PLC and a PC. Students can learn the basics of control using flow charts before progressing to other languages like C++ or LabView software (C++ and LabView not included). A wide range of curriculum is included in the packs covering industrial sense and control, flow chart programming of microcontrollers, industrial sense and control with C++ or LabView programming and design of pneumatic control systems. Further curriculum options for programming in C or Assembly are also available.



Learning Objectives

- PIC and controller programming using flow charts
- Programming options: Embedded C, Assembly, C++ or LabView
- Mathematical models of sensors
- PID control of DC motors with speed and position (2nd order)
- Sensors: thermistor, light, thermocouple, rotary, Gyroscope, Hall effect, PIR, CAP touch, Magnetometer, Ultrasonic, Colour
- Actuators: relays, stepper motors, DC motors with feedback, servo motors

Automatics essentials solution

The Automatics essentials solution provides a complete introduction to pneumatic circuit design and construction, allowing students to progress from first principles through to circuits of moderate complexity including reciprocating circuits and generating sequences of movements.

Learning objectives include:

- Understanding the different varieties of valves and where each is appropriate in a system
- Understanding the basic types of cylinder, controlling speed and the factors that influence power output
- Combining valves to produce logic functions
- Semi-automatic and automatic reciprocation
- Using reservoirs to create time delays

Compressor

This desk mounted compressor is an oil-less piston compressor, with a small electric 1/8HP motor that is designed to operate on the Automatics platform. It is powerful, compact, reliable and quiet. It includes a dial showing the pressure in the output pipe (0 to 100psi), an on/off switch and air outlet switch and an air pressure adjustment knob. The unit is powered from 240V

Automatics pneumatic control add on kit

This kit extends the essentials solution by adding a powerful programmable microcontroller unit, the MIAC, together with the pneumatic components necessary to put it through its paces. Using this kit, students will learn how the combination of a controller and custom software can create powerful and flexible pneumatic systems. They will also learn how to establish the state of a pneumatic machine using sensors, the use of logic to process that data and the issuing of commands to the included solenoid valves.

Learning objectives include:

- Reading sensors and switches
- Issuing commands to the pneumatic circuits
- Learning the difference between digital and analogue signals
- Programming sequences

Curriculum

All Automatics curriculum is available free online at: www.matrixtsl.com/automatics/resources

Curriculum packs:

- AW2080 Automatic Essentials
- AW4956 Control Pneumatics
- AW4957 Control Pneumatics PLUS

Solution contents

Locktronics Industrial Sense and Control Kit

A two tray solution that includes a cased MIAC and provides an introduction to the role of the industrial controllers—under control of conventional controller software, as well as third party applications like LabView™ and Visual Basic™. Students are given several industrial applications that they need to construct and develop programs for and sample applications in Flowcode, Visual Basic and LabView are provided.

Learning objectives include:

- DC motors with speed control
- Stepper motors
- Relays and solenoids
- Temperature and light sensors
- Control of systems using Flowcode, Visual Basic and Lab-View
- Potential dividers and their use
- Transistors as switches
- Electric controllers and their function
- Open and closed loop feedback
- Control system operation and function



Curriculum

All Locktronics curriculum is available free online at:

www.matrixtsl.com/locktronics/resources

Curriculum pack:

- LK8739 Industrial sensor, actuator and control applications

Standard PIC micro starter pack

The standard PIC micro starter pack is an ideal general purpose kit which enables studying and projects in a variety of programming languages. The pack contains a variety of E-blocks, including the PIC microcontroller multiprogrammer with our revolutionary Ghost Technology. To read more about Ghost Technology, click here: <http://www.matrixtsl.com/ghost/> The starter pack also includes a metal backplane, quick snap mounting pillars, leads, power supplies and a rugged storage case.

E-blocks sensors bundle

The E-blocks sensors range allows you to gather real world data for your electronic system. The E-blocks Sensors bundle includes our most popular sensor modules neatly packaged into one container making it ideal for a learning environment. It also comes complete with one EB090 sensors motherboard.

With a full set of working Flowcode examples provided via our website you can easily learn how to interface with sensors such as digital temperature, humidity, colour, infrared, ultra-sound, accelerometers and more.

Motor Control Training Solution

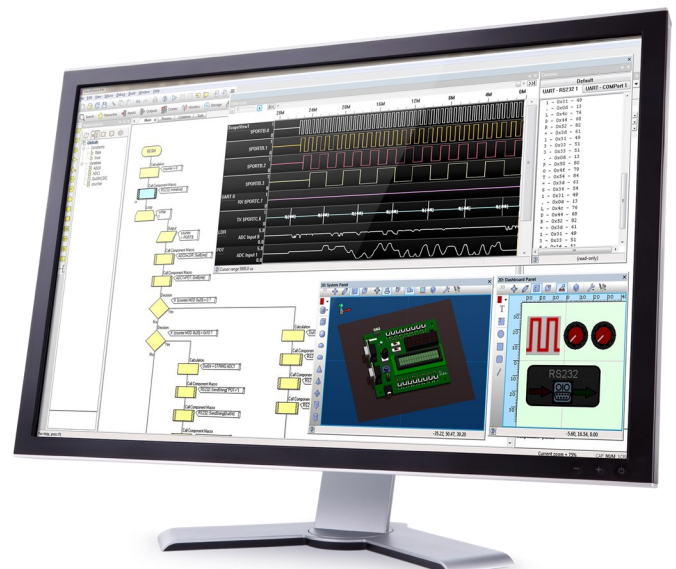
The motor control training solution provides a practical way of allowing students to understand the techniques of controlling DC motors. The solution is based on dsPIC technology. The equipment consists of a number of E-blocks boards mounted on a metal backplane: a programmer board, a switch board, and LCD board, a motor power board, a DC motor velocity control board and a DC motor position control board. This solution provides a complete 20 hours course in developing systems based on DC motor control technology. A 60+ page printed and bound manual with student exercises is included, along with fully worked examples on CD Rom.

Learning objectives include:

- Simple motor control—direction, speed
- Sensors in motor control systems: IR, F to V conversion, resistive
- PID control of velocity
- Servo systems
- PID control of position
- First & second order functions
- Programming using Flowcode/C/C++

FLOWCODE 6

- Single user Flowcode V6 professional for dsPIC
- Flowcode V6 PIC chip pack





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