



# microcontroller

## computer systems engineering kit

Microcontrollers are small, self-contained computers. They are the "brains" inside dozens of the devices and appliances you use every day. Microwaves, washing machines, cars, telephones, and stereos all have microcontrollers inside them. A microcontroller is a computer-on-a-chip, and includes a processor, memory for storing data, timers, and ports for connecting to other components. As our everyday devices become increasingly "smarter" with embedded technology, microcontrollers are becoming more and more important.

This kit introduces you to microcontrollers, sensors, and programming through 100 experiments. Build devices that use sensors to monitor and record data, and use the data to control motors, buzzers, lights, and a digital display. Write programs to control the devices you build. For example, you

can build a light meter using a light dependent resistor and record the light levels in a room over a 12-hour period. Or measure and record the temperature outside and record a temperature sensor, then graph the results. The number of possible experiments is infinite.

Each experiment gives something like this: First, you will assemble a circuit and write a program following the detailed instructions in the manual. Then, you will upload the program to the microcontroller using an infrared interface. The program tells the microcontroller how to perform your experiment and store the data. Finally, the data stored in the microcontroller can be downloaded to the computer for viewing using the infrared interface.

The 144-page, full-color experiment manual guides you through circuit assemblies and programming.



### contents

experiment manual • software on cd-rom • portable case • circuit board • infrared interface for pc • usb adapter for interface • microcontroller module • display module • motor • microphone • potentiometer • photo transistor • 2 optoisolators • 2 gmp transistors • measure sensor • piezo light sensor • on temperature sensor • 3 silicon diodes • 7 light emitting diodes • 2 electrolytic capacitors • resistor • 12 resistors • 2 control switches • bread • 4-pin header • fuse • 73 control pins • 30 short wires • 30 medium wires • 18 long wires • 2 mounting strips

### experiments

light meter  
traffic light  
dice game  
egg timer  
counter  
stopwatch  
subtractor  
generator

rain sensing wiper  
motor speed device  
digital recorder  
music player  
flipper switch  
programmable motor  
sensor controlled fan  
frequency meter

144  
page  
book  
ages  
12+  
100  
experiments



© 2008 Thames & Kosmos, LLC, Putnam, NJ 07071

www.thameskosmos.com

Thames & Kosmos is a registered trademark of Thames & Kosmos, LLC. Permission to use all rights reserved. Right's technical drawings reserved.

Customer Service  
1-800-881-0072

#### Power Supply Requirements

Requires one 9 volt battery (not included) or a standard Power Adapter (not included). Adapter specifications: DC 9 volt output, barrel connector with outer diameter of 2.5 mm and inner diameter of 2.3 mm, positive pin on outside, negative pin on inside. Do not use a "switch-mode" type adapter.

#### Software System Requirements

• PC with Microsoft® Windows® 98, 2000, or XP operating system  
• Minimum 64 MB of RAM  
• Minimum 5 MB of free hard-disk space  
• Available 9-pin serial (COM) or USB port  
• CD-ROM drive

#### Caution!

Not to be used by children except under the supervision of adults who have familiarized themselves with the experiments and safety procedures in the manual. Only for use by children 8 years of age or older. Components in this kit may be sharp or toxic. Handle with caution.



WARNING!  
CHECKING PARTS: not for children under 8 years



Thames & Kosmos



No. 614713