PICmicros (PICs) offer all the features of a computer control system in one chip. PIC-Logicator provides a complete and user-friendly system for programming and using PICmicros in the classroom.

PIC-Logicator Software
The heart of the system is PIC-Logicator Software, the visual design software for creating, testing and modifying control systems for PICmicros.
Control systems are created as flowcharts by dragging commands onto the screen and drawing routes between them. Command instructions are set by simple mouse clicks.

Drawing the program on screen clarifies the logic of a control system, especially the use of repeat loops and sub-systems.

1. Design your control system as an on-screen flowchart using PIC-Logicator software. You can de-bug the system by test running it before downloading it to the chip.
2. Click the “Program PIC” button. The Programmer automatically downloads the system into a PICmicro chip in seconds.
3. Use the programmed PIC in a project circuit, or in any of the ready-made control resources in the PIC-Logicator range.

PIC-Logicator software provides a full range of control operations:
- switching outputs
- sequences
- timing
- counting
- using feedback from digital and analogue sensors
- sub-systems
- logical and mathematical functions.

Interrupts and events provide parallel processing. Commands are also included to make use of specialist features of a PICmicro, such as: accessing the chip’s EEPROM memory; putting the chip into low-power mode; outputting information to a serial device such as a printer or LCD screen.

See PIC-Logicator software in action in the interactive demo on the Economatics website www.economatics.co.uk/education

When the program is test run, de-bugging is made easy as each command is highlighted as it is executed, and a live window monitors the state of inputs and outputs.
PIC-Logicator Pack

Pack contains:
- Programmer complete with serial lead and plug-in type power supply.

PIC-L/2
1-2 Packs £130.00 each
3+ Packs £120.00 each

3-Programmer Pack
This pack contains three Programmers each with serial lead and plug-in type power supply; together with PIC-Logicator Software (Site licence) and one copy of the PIC-Logicator Book.

ECON 3200 £329.00

A Serial/USB Adaptor is available to enable a PIC-Logicator Programmer to be connected to a USB port on a PC.

USB-232 £36.95

Analogue Calibration Board
This board enables you to calibrate a simple potential-divider analogue sensor so that you can set appropriate switching thresholds in your control system. It can be powered by the power supply supplied in the PIC-Logicator Pack.

PIC-ACB £32.95

PICmicro Chips
All of these PICmicro chips are Flash Reprogrammable. They are reprogrammed electronically using the Programmer supplied in the PIC-Logicator Pack. Reprogramming is quick and easy, and can be done as many times as you like.

16F627 18 pin
8 Outputs
7 Digital Inputs
Includes internal resonator
PIC16F627 Pack of 10 £24.00

16F84 18 pin
8 Outputs
5 Digital Inputs
Requires 4MHz resonator
PIC16F84 Pack of 10 £32.00

16F628 18 pin
8 Outputs
5 Digital Inputs
2 Analogue Inputs
Includes internal resonator
PIC16F628 Pack of 10 £27.50

16F872 28 pin
8 Outputs
8 Digital Inputs
4 Analogue Inputs
Requires 4MHz resonator
PIC16F872 Pack of 10 £33.00

The current version of PIC-Logicator software now supports all four of the above chips. Existing users can download a software upgrade from our website www.economatics.co.uk/education, or call our Sales Office (0114 281 3311).

Pin Protectors for PICmicro Chips
Extend the life of your chips with these turned pin wire wrap sockets. Inserting a chip into one of these sockets provides it with a set of strong, rigid pins so that the chance of damage when inserting or removing it is much reduced. Suitable for use with any 18-pin chip.

22-0225 Pack of 10 £10.00
Pic-Logicator Startup Packs

The perfect introduction to PICmicros, these fully self-contained packs provide beginners with everything they need to start programming, downloading and seeing the results instantly.

Startup Pack One
This pack is based on the T-board with Digital Inputs.
- 1 x PIC-Logicator Pack (PIC-L/2)
- 1 x T-board (PIC-TB), including a PIC16F84 chip
- 1 x T-board Teaching Pack
- 2 x spare PIC16F84 chips with pin protectors

PIC-SP £167.95

Save £15.00

Startup Pack Two
This pack is based on the T-board with Analogue and Digital Inputs.
- 1 x PIC-Logicator Pack (PIC-L/2)
- 1 x T-board (PIC-TBA), including a PIC16F628 chip
- 1 x T-board Teaching Pack
- 2 x spare PIC16F628 chips with pin protectors

PIC-SP/A £167.95

See Page 20 for details of T-boards.

PIC-Logicator Plus Pack

This pack contains:
- Programmer complete with serial lead and plug-in type power supply.

PLUS
“Programming Editor” software and an upgrade to the Programmer to enable use of this software. “Programming Editor” enables programming and compiling of BASIC programs, which can be downloaded using the PIC-Logicator Programmer. It includes a comprehensive Help file with full instructions on the BASIC language, and worked examples. The software automatically converts the BASIC program into assembler code which can be displayed, to provide a valuable tool for users wishing to extend their PICmicro programming ability.

PIC-L/PLUS 1-2 Packs £156.00 each
3+ Packs £146.00 each

Upgrade Pack
This pack upgrades a PIC-Logicator Pack to a PIC-Logicator Plus Pack. It involves returning the Programmer for upgrading. Contact our Sales Office for details.

PIC-UPG £50.00

PIC-Logicator Emulator

This is an extremely useful, time-saving tool for students who are building complex PIC programs. It enables them to communicate directly between the software and their project circuit, so that the program can be tested frequently, without the need to download it to a chip each time.

Emulator Project PIC-EM £117.95
**Pic-Logicator Project Boards**

Project Boards provide a ready-made interface between a PICmicro chip and input/output devices. Younger students can connect models to Project Boards; then build and test PIC-Logicator programs to control them.

**Project Board with Fischertechnik model**

Older students can use them to prototype their projects.

Project Boards include a low insert force (LIF) socket for the programmed chip, and sockets for connection of input and output devices. The outputs are configured for: 4 output devices such as buzzers or lamps, and 2 motors.

Sets of ready-made connection leads are available for each type of Project Board. Leads are 300mm long, with a connector at one end and bared wire at the other.

**Project Board for 18 pin PICmicro with Analogue Inputs**

This board is for use with PICmicro chip 16F628. It has input sockets for 5 digital and 2 analogue input devices.

<table>
<thead>
<tr>
<th>Set of Leads</th>
<th>PIC-18A/LEADS</th>
<th>1 - 4 Sets</th>
<th>£20.95 each</th>
<th>5+ Sets</th>
<th>£19.95 each</th>
</tr>
</thead>
</table>

**Power Supply**

Each Project Board has a socket for connection of a low voltage power supply. The 9V,1A Power Supply, 2025-9097/rp, is recommended for use with Project Boards. Each board also has holes to solder on a battery-snap lead for connection of a 6V (4 x AA cells) battery.

<table>
<thead>
<tr>
<th>Power Supply</th>
<th>PIC-2025-9097/rp</th>
<th>1 - 4 Units</th>
<th>£14.95 each</th>
<th>5+ Units</th>
<th>£13.95 each</th>
</tr>
</thead>
</table>

**Rechargeable Batteries**

Ni-Cd rechargeable batteries AA (HP7) size 1.2V 600mAh 18-0175 £0.98 each

**Charger**

Suitable for rechargeable Ni-Cd batteries. Charges up to 4 x AA, C, or D size at a time, plus 1x PP3. Incorporates a battery test facility, and LED indicators at each charge point to monitor charge status. Complete with mains lead and fitted 13A plug.

Charging time: 4 x AA size - 7 to 8 hours; 4 x C, 4 x D, PP3 size - 14 to 16 hours. 18-0300 £8.95

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**Project Board for 18 pin PICmicro**

This board is for use with PICmicro chips 16F84 and 16F627. It has input sockets for 5 digital input devices.

<table>
<thead>
<tr>
<th>PIC-18A</th>
<th>1 - 4 Boards</th>
<th>£30.95 each</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5+ Boards</td>
<td>£28.95 each</td>
</tr>
</tbody>
</table>

**Set of Leads**

<table>
<thead>
<tr>
<th>PIC-18/LEADS</th>
<th>1 - 4 Sets</th>
<th>£18.95 each</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>5+ Sets</td>
<td>£17.95 each</td>
</tr>
</tbody>
</table>

**Project Board for 28 pin PICmicro**

This board is for use with PICmicro chip 16F872. It has input sockets for 8 digital and 4 analogue input devices.

<table>
<thead>
<tr>
<th>PIC-28A</th>
<th>1 - 4 Boards</th>
<th>£34.95 each</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5+ Boards</td>
<td>£32.95 each</td>
</tr>
</tbody>
</table>

**Set of Leads**

<table>
<thead>
<tr>
<th>PIC-28/LEADS</th>
<th>1 - 4 Sets</th>
<th>£31.95 each</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5+ Sets</td>
<td>£29.95 each</td>
</tr>
</tbody>
</table>

**Project Board for 28 pin PICmicro with Analogue Inputs**

This board is for use with PICmicro chips 16F84 and 16F627. It has input sockets for 5 digital input devices.
The Fischertechnik PIC-Buggy is also available separately in kit form with full instructions.

PICFTBUG £69.95

This fully self-contained package makes an ideal introduction to mobile robotics with PIC-Logicator. It contains a ready-assembled Fischertechnik PIC-Buggy which has: two motors to enable steering, two microswitches to sense obstacles, two large LEDs and a piezo sounder so it can flash its lights and play tunes as it travels around. It also has a low insert force (LIF) socket for the programmed chip, an on/off switch, and a holder for 4 x AA batteries (supplied).

In addition to the Buggy, the Robot Missions package contains:

- PIC-Logicator Software for Windows (Site licence) for PCs running Windows 95/98/2000,
- PIC-Logicator Programmer complete with serial lead and plug-in type power supply,
- 2 x 16F84 PICmicro chips with pin protectors,
- Robot Missions book containing full instructions and structured teaching materials,
- Supplied in a high-quality, robust storage case.

PICBU Mini Robots

PICBU is a basic design for a low cost robot buggy. It makes an ideal PIC-based design and make project for KS3. At its simplest, PICBU has two motors to enable it to steer. If you want your students to add more features, the ready-made PCB also provides connections for: 2 microswitches to sense obstacles in its path; 2 LEDs to act as indicators or “eyes”; and a piezo sounder that can be programmed to play tunes. It is designed to be powered by a PP3 9V battery.

PICBU PCBs

PICBU-PCB Pack of 10 £14.95

Full information including; components list, assembly instructions, and CAD files for the chassis and wheels are available from our website.

Also available is a kit to make a complete PICBU containing all the options. Once assembled, this makes an ideal stimulus for the start of the project.

PICBU Kit £24.95

components not included
**PIC-Logicator T-boards**

T-boards, together with the T-board Teaching Pack, offer a ready-made resource for teaching PIC-Logicator. They contain: on-board input and output devices, a low insert force (LIF) socket for a PICmicro chip, and all the necessary connections to provide an instant working control system as soon as power is connected and a programmed chip is inserted. Each board is supplied with a PICmicro chip.

Two different T-boards are available:

**T-board with Digital Inputs**

Output devices: 8 LEDs and a piezo sounder, plus connection for the output modules shown on page 21. Input devices: 5 push switches.

*For use with PIC 16F84 or PIC16F627.*

<table>
<thead>
<tr>
<th>PIC-TB</th>
<th>1 - 4 Boards</th>
<th>£29.95 each</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5 + Boards</td>
<td>£27.95 each</td>
</tr>
</tbody>
</table>

**T-board with Analogue and Digital Inputs**

Output devices: 8 LEDs and a piezo sounder, plus connection for the output modules shown on page 21. Input devices: 3 push switches and 2 analogue sensors (a light sensor and a variable resistor).

*For use with PIC16F628.*

<table>
<thead>
<tr>
<th>PIC-TBA</th>
<th>1 - 4 Boards</th>
<th>£31.95 each</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5 + Boards</td>
<td>£29.95 each</td>
</tr>
</tbody>
</table>

The 9V, 300mA Power Supply (9019-9097/rp) contained in the PIC-Logicator Pack is suitable for powering the T-board. This power supply is available separately.

9019-9097/rp  £7.95

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**T-board Teaching Pack**

The T-board Teaching Pack provides a structured course for teaching PIC-Logicator, using all the input and output devices on the T-boards. It is suitable for use with either of the two T-boards.

It contains a set of photocopiable laminated cards providing progression from the basics of switching outputs and responding to digital and analogue sensors, to: sub-routines, counting, timing, interrupts and using the PICmicro’s EEPROM memory.

Also included are a Teacher’s Guide and a disk of PIC-Logicator files including all the control systems shown on the cards, and suggested solutions to extension activities.

PIC-TBPACK  £15.00

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**T-board PCB**

This ready-made printed circuit board enables students to construct a variety of PICmicro-based circuits that use the same range of input and output devices as those on the T-board with Digital inputs. They simply solder on the appropriate components, and attach a 6V battery. Components are not included.

It allows activities from the T-board Pack to be developed into a fully-realised product, such as an alarm system; musical gift or greeting card; or a device for counting or timing.

PIC-TBPCB  Pack of 10  £22.50
T-board Output Modules

A range of modules that offer a variety of display and communication outputs. They can be plugged directly into a T-board, or connected to a student’s own project. All modules are supplied with full instructions.

Seven Segment Display Module

This module has a super bright, one inch high, red seven segment display unit mounted on the board. The legend on the board clearly shows which output is connected to which segment, allowing easy programming of the display.

PIC-SEG £10.95

Driver Module

This module provides sockets for connection of 2 motors and 4 output devices. Each output can supply 5V, max. 600mA. Max. total current across all outputs: 1A. When used with a Driver Module, the T-board should be powered by the 9V, 1A power supply, 2025-9097/rp (see page 18).

PIC-DRV £19.95

T-board Module Connector

This unit plugs directly into the connector on the module, and provides a screw terminal block for connection of power (6V) and signal lines to the module.

PIC-ADB £4.95

Serial LCD Module

This module allows simple control of an alphanumeric liquid crystal display for displaying text messages as part of a project. It can be used to display instructions, warning messages or the results of experiments, as the program runs. The screen displays two rows of 16 characters.

PIC-LCD £52.95

Sound Module

This module provides a digital sound recording and playback facility capable of up to 48 seconds of recording time. It allows students to explore projects that “talk” or play music samples. A microphone (mounted on the board) and small conventional speaker are supplied.

PIC-SND £45.95

Serial LCD Module

This module allows simple control of an alphanumeric liquid crystal display for displaying text messages as part of a project. It can be used to display instructions, warning messages or the results of experiments, as the program runs. The screen displays two rows of 16 characters.

PIC-LCD £52.95

LCD Kit

Using an LCD screen to display information is increasingly popular in student projects, and this kit provides all the necessary components and information. Circuits and PCB designs are available on the Economatics website.

PIC-LCD/KIT £19.95

Infra-red Control Kit

This kit contains: a handheld infra red transmitter, infra red receiver module, motor driver board, battery snap lead and holder for 4 x AA batteries (not included), and instruction booklet. It allows students to explore the use of infra red control of electrical devices such as lamps, motors, solenoids. Combining the Infra red Control Kit with a PIC-Logicator Project Board enables students to explore projects that combine remote control and programmability.

IRCP £39.95

Project Kits

Complete kits for PIC-Logicator based projects. They include everything except batteries. Soldering and simple tools are required.

Buggy Kit

PIC-BUGGY £56.95

Assembled Buggy

PIC-BUGGY/M £68.95

Security Lock Kit

This project enables students to develop a PIC-Logicator program to scan the keypad, check key presses against a PIN sequence, and switch outputs accordingly.

PIC-LOCK £35.95