

THE No 1 UK MAGAZINE FOR ELECTRONICS TECHNOLOGY & COMPUTER PROJECTS

EPE EVERYDAY PRACTICAL ELECTRONICS

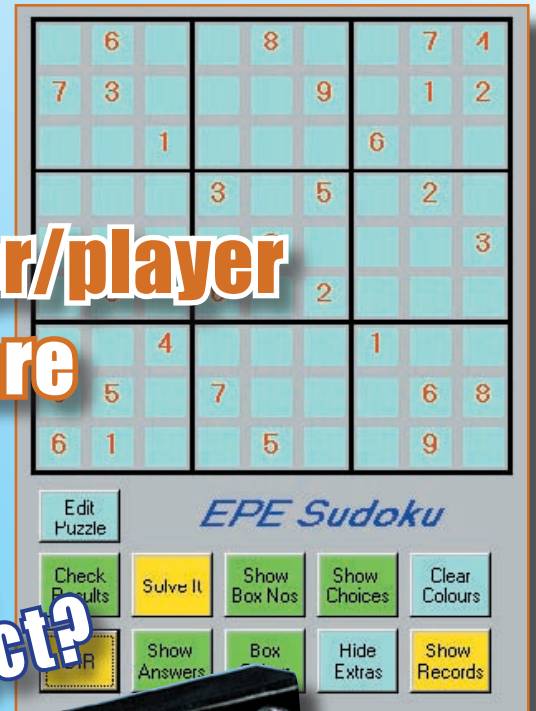
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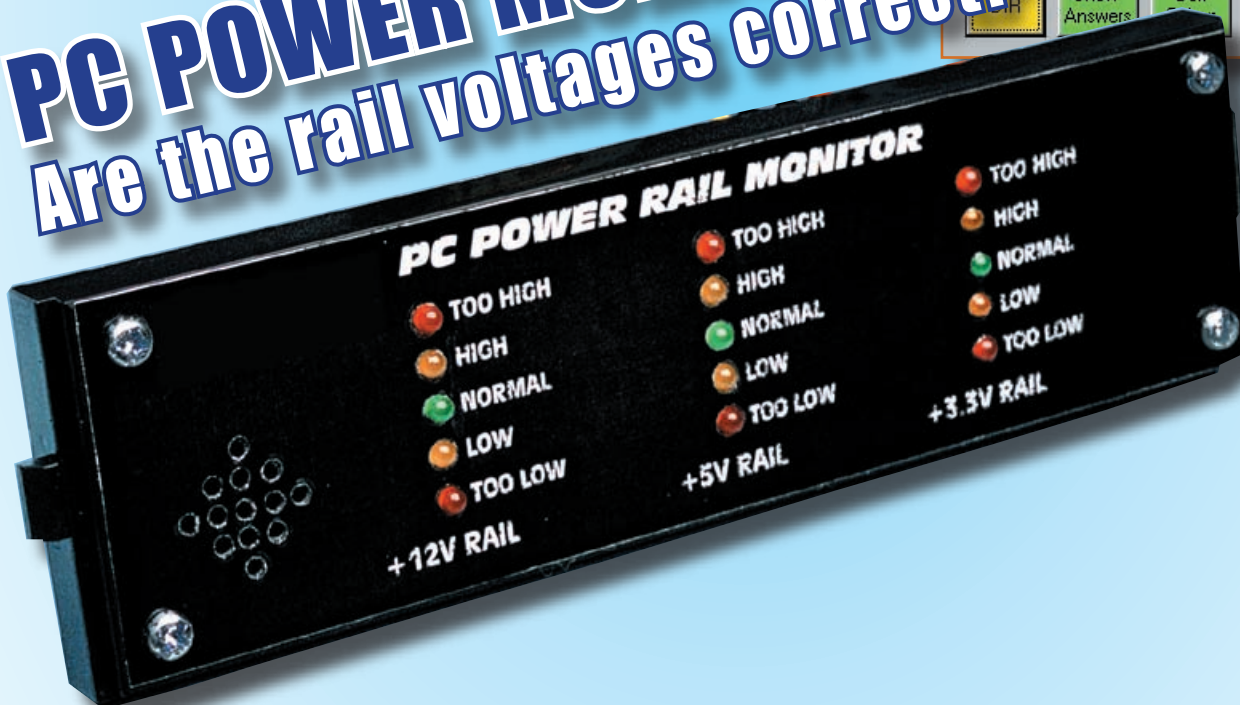
PIC SUDOKU

Hand-held puzzle generator/player

PLUS Puzzle Solving Software



PC POWER MONITOR
Are the rail voltages correct?



DIRT CHEAP 17A/13.5V POWER SUPPLY

Vol 35 No 7 \$5.95 US \$7.99 CAN
JULY 2006 PRINTED IN THE UK



NEW ELECTRONIC CONSTRUCTION KITS



This 30 in 1 electronic kit includes an introduction to electrical and electronic technology. It provides components that can be used to make a variety of experiments including Timers and Burglar

Alarms. Requires: 3 x AA batteries. £15.00 ref BET1803

AM/FM Radio This kit enables you to learn about electronics and also put this knowledge into practice so you can see and hear the effects. Includes manual with explanations about the components and the electronic principles. Req's: 3 x AA batts. £13 ref BET1801



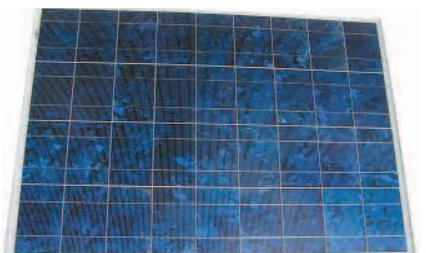
This 40 in 1 electronic kit includes an introduction to electrical and electronic technology. It provides components that can be used in making basic digital logic circuits, then progresses to using Integrated circuits to make

and test a variety of digital circuits, including Flip Flops and Counters. Req's: 4 x AA batteries. £17 ref BET1804

The 75 in 1 electronic kit

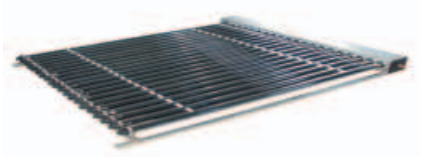
includes an introduction to electrical and electronic technology. It provides components that can be used to make and test a wide variety of experiments including Water Sensors, Logic Circuits and Oscillators. The kit then progresses to the use of an integrated circuit to produce digital voice and sound recording experiments such as Morning Call and Burglar Alarm. Requires: 3 x AA batteries. £20 ref BET1806

SOLAR PANELS



We stock a range of solar photovoltaic panels. These are polycrystalline panels made from wafers of silicon laminated between an impact-resistant transparent cover and an EVA rear mounting plate. They are constructed with a lightweight anodised aluminium frame which is predrilled for linking to other frames/roof mounting structure, and contain waterproof electrical terminal box on the rear. 5 watt panel £29 ref 5wnav 20 watt panel £99 ref 20wnav 60 watt panel £249 ref 60wnav. Suitable regulator for up to 60 watt panel £20 ref REGNAV

EVACUATED TUBE SOLAR HOT WATER PANELS



(20 tube shown) These top-of-the-range solar panel heat collectors are suitable for heating domestic hot water, swimming pools etc - even in the winter! One unit is adequate for an average household (3-4 people), and it is modular, so you can add more if required. A single panel is sufficient for a 200 litre cylinder, but you can fit 2 or more for high water usage, or for heating swimming pools or underfloor heating. Some types of renewable energy are only available in certain locations, however free solar heating is potentially available to almost every house in the UK! Every house should have one - really! And with an overall efficiency of almost 80%, they are much more efficient than electric photovoltaic solar panels (efficiency of 7-15%). Available in 10, 20 and 30 tube versions. 10 tube £199, 20 tube £369, 30 tube £549. Roof mounting kits (10/20 tubes) £12.50, 30 tube mounting kit £15



200 watts (£299) up to 20kW (£13,999) The 200w system is complete apart from 2x12v batteries and concrete for the tower. These low cost systems can provide substantial amounts of power, even in average wind conditions.



and is quite safe. All critical parts (boiler, end caps, safety vent etc.) are ready finished to ensure success. The very detailed instruction booklet (25 pages) makes completion of this project possible in a step by step manner. Among the techniques experienced are silver soldering, folding, drilling, fitting and testing. £29.70 ref STEAMKIT Silver solder/flux pack £3.50 ref SSK

HOT AIR MOTOR (Stirling motor) This is an interesting metal based project for pupils aged 15 plus. The material pack will enable them to make a fully functional hot air motor. All the critical parts (piston, working cylinder, flywheel and coolers) have been pre-made and are ready for use. The detailed plans show all the important stages for the required metal working (Measuring with a vernier, sawing, silver soldering, drilling, marking out, thread making, silver soldering, sawing and filing, etc) At the same time the principles of the hot air motor are described in the wide ranging instructions. Technical data : Working cylinder stroke \varnothing 12 x 10 mm Pressure cylinder stroke \varnothing 13 x 11 mm Unloaded speed approx. 800 rpm Size: Flywheel dia. 55mm Base 130 x 130 mm With sinter smooth bearings and ready shaped cooler. £29.70 ref STEAMKIT2 Silversolder pack £3.50 ref SSK



mW/K 22 g, 49 mV/K £14 ref TEL1

Die cast illuminated microscope set in plastic carry case Includes a handy carry case with a 1200x magnification microscope. Contents include test tubes, magnifier glass and probe. Requires 2 x AA batteries (not included). ultra-compact, lightweight, easy to use and comfortable to hold. An ideal microscope for the beginner offering a good magnification range. £25.99 ref MAG1200



2kW WIND TURBINE KIT The 2kW wind turbine is supplied as the following kit: turbine generator 48v three taper/ twisted fibreglass blades & hub 8m tower (four x 2m sections) guylines / anchors / tensioners / clamps foundation steel rectifier 2kW inverter heavy-duty pivot tower. £1,499 Other sizes available from



STEAM ENGINE KIT

The material in this pack enables you to build a fully functional model steam engine. The main material is brass and the finished machine demonstrates the principle of oscillation. The boiler, uses solid fuel tablets, and is quite safe. All critical parts (boiler, end caps, safety vent etc.) are ready finished to ensure success. The very detailed instruction booklet (25 pages) makes completion of this project possible in a step by step manner. Among the techniques experienced are silver soldering, folding, drilling, fitting and testing. £29.70 ref STEAMKIT Silver solder/flux pack £3.50 ref SSK



BENCH PSU 0-15V 0-2a Output and voltage are both smooth and can be regulated according to work. Input 230V, 21/2-number LCD display for voltage and current, Robust PC-grey housing Size 13x15x21cm, Weight 3,2kg £48 REF trans2

STIRLING ENGINES



HB10 One of our range of Stirling engines The Bohm HB10 Stirling engine is available in both ready built and kit form. The power comes from a small spirit burner, once lit just watch this amazing Stirling engine run. HB10 in kit form is £97.95 or £101.99 built. Many other models in stock. Order online at www.mamodspares.co.uk



notice via FAX, FTP or email, Modes- continuous record, motion detection record, sheduled record, time lapse record, dynamic IP, can send live images to your mobile phone. £109 ref RAPIDOS

HEAT PUMPS

A heat pump is a system that uses a refrigeration-style compressor to transfer heat from outside to inside, in order to heat offices or homes. Heat pumps can take heat from the air, water or ground. Ground source heat pumps are very efficient - in fact you will get 3-4 units of heat for every unit of electricity supplied to the heat-pump. Basic component parts of a GSHP:



- 1 A heat pump packaged unit: Water-Water type. (approx. the size of a small fridge) containing two cold water connections and two heated water connections.
 2. The heat source which is usually a closed loop of plastic pipe containing water with glycol or common salt to prevent the water from freezing. This pipe is buried in the ground in vertical bore holes or horizontal trenches. The trenches take either straight pipe or coiled (Slinky) pipe, buried about 1.5 to 2m below the surface. A large area is needed for this.
 3. The heat distribution system. This is either underfloor heating pipes or conventional radiators of large area connected via normal water pipes.
 4. Electrical input and controls. The system will be require an electrical input energy, single phase is perfectly adequate for smaller systems. A specialised controller will be incorporated to provide temperature and timing functions of the system.
- This type of installation offers many advantages.
- a) The water-water heat pump unit is a sealed and reliable self contained unit.
 - b) There are no corrosion or degradation issues with buried plastic pipes.
 - c) The system will continue to provide the same output even during extremely cold spells.
 - d) The installation is fairly invisible. i.e. no tanks or outside unit to see.
 - e) No regular maintenance required.

Some tips

The efficiency of any system will be greatly improved if the heated water is kept as low as possible. For this reason, underfloor heating is preferred to radiators. It is vital to ensure that the underfloor layout is designed to use low water temperatures. i.e. plenty of pipe and high flow-rates. If radiators are to be used, they must be large enough. Double the normal sizing (as used with a boiler) is a good starting point.

5Kw (output) ground to air heat pump £1,099 ref HP5
9kw (output) ground to water heat pump £1,999 ref HP9

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PIC & ATMEL Programmers

We have a wide range of low cost PIC and ATMEL Programmers. Complete range and documentation available from our web site.

Programmer Accessories:

40-pin Wide ZIF socket (ZIF40W) £15.00
18VDC Power supply (PSU010) £19.95
Leads: Parallel (LDC136) £4.95 / **Serial (LDC441)** £4.95 / **USB (LDC644)** £2.95

NEW! USB 'Flash' PIC Programmer

USB PIC programmer for most 'Flash' devices. No external power supply making it truly portable. Supplied with box and Windows Software. ZIF Socket and USB Plug A-B lead not incl.

Kit Order Code: 3128KT – £34.95

Assembled Order Code: AS3128 – £39.95



"PICALL" ISP PIC Programmer

"PICALL" will program virtually all 8 to 40 pin serial-mode* AND parallel-mode (PIC16C5x family)* Programmed PIC micro controllers. Free fully functional

software. Blank chip auto detect for super fast bulk programming. Parallel port connection. Supply: 16-18V dc.

Assembled Order Code: AS3117 – £24.95

ATMEL 89xxx Programmer

Uses serial port and any standard terminal comms program. 4 LEDs display the status. ZIF sockets not included. Supply: 16VDC.

Kit Order Code: 3123KT – £29.95



NEW! USB & Serial Port PIC Programmer

Header cable for ICSP. Free Windows software. See website for PICs supported. ZIF Socket and USB Plug A-B lead extra. 18VDC.

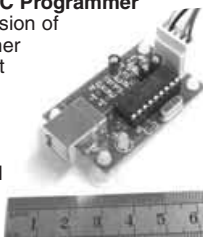
Kit Order Code: 3149KT – £34.95

Assembled Order Code: AS3149 – £49.95

USB Flash ICSP PIC Programmer

Fully assembled version of our 3128 USB Flasher PIC Programmer but WITHOUT the pre-programming socket. It just has 5-pin ICSP header (GND, VCC, CLK, DAT, VPP) and cable. No external PSU required. Free Windows software.

Order Code: AS3182 – £37.95



ABC Maxi AVR Development Board

The ABC Maxi board has an open architecture design based on Atmel's AVR AT90S8535 RISC microcontroller and is ideal for developing new designs.

Features:

- 8Kb of In-System Programmable Flash (1000 write/erase cycles) • 512 bytes internal SRAM • 512 bytes EEPROM
- 8 analogue inputs (range 0-5V)
- 4 Opto-isolated Inputs (I/Os are bi-directional with internal pull-up resistors)
- Output buffers can sink 20mA current (direct i.e.d. drive) • 4 x 12A open drain MOSFET outputs • RS485 network connector • 2-16 LCD Connector
- 3.5mm Speaker Phone Jack
- Supply: 9-12VDC.

The ABC Maxi STARTER PACK includes one assembled Maxi Board, parallel and serial cables, and Windows software CD-ROM featuring an Assembler, BASIC compiler and in-system programmer.

Order Code ABCMAXISP – £89.95

The ABC Maxi boards only can also be purchased separately at £69.95 each.



Controllers & Loggers

Here are just a few of the controller and data acquisition and control units we have. See website for full details. Suitable PSU for all units: Order Code PSU445 – £8.95

Rolling Code 4-Channel UHF Remote

State-of-the-Art. High security. 4 channels. Momentary or latching relay output. Range up to 40m. Up to 15 Tx's can be learned by one Rx (kit includes one Tx but more available separately). 4 indicator LEDs.

Rx: PCB 77x85mm, 12VDC/6mA (standby). Two & Ten Channel versions also available.

Kit Order Code: 3180KIT – £39.95

Assembled Order Code: AS3180 – £47.95



Computer Temperature Data Logger

Serial port 4-channel temperature logger. °C or °F. Continuously logs up to 4 separate sensors located 200m+ from board. Wide range of free software applications for storing/using data. PCB just 38x38mm. Powered

by PC. Includes one DS1820 sensor and four header cables.

Kit Order Code: 3145KT – £16.95

Assembled Order Code: AS3145 – £23.95

Additional DS1820 Sensors – £3.95 each



NEW! DTMF Telephone Relay Switcher

Call your phone number using a DTMF phone from anywhere in the world and remotely turn on/off any of the 4 relays as desired. User settable Security Password, Anti-Tamper, Rings to Answer, Auto Hang-up and Lockout. Includes plastic case. 130 x 110 x 30mm. Power: 12VDC.

Kit Order Code: 3140KT – £39.95

Assembled Order Code: AS3140 – £59.95

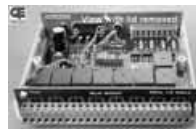


Serial Port Isolated I/O Module

Computer controlled 8-channel relay board. 5A mains rated relay outputs and 4 opto-isolated digital inputs (for monitoring switch states, etc). Useful in a variety of control and sensing applications. Programmed via serial port (use our new Windows interface, terminal emulator or batch files). Serial cable can be up to 35m long. Includes plastic case 130 x 100 x 30mm. Power: 12VDC/500mA.

Kit Order Code: 3108KT – £49.95

Assembled Order Code: AS3108 – £59.95



Infra-red RC 12-Channel Relay Board

Control 12 on-board relays with included infra-red remote control unit. Toggle or momentary. 15m+ range. 112 x 122mm. Supply: 12VDC/0.5A.

Kit Order Code: 3142KT – £39.95

Assembled Order Code: AS3142 – £49.95



PC Data Acquisition & Control Unit

Monitor and log a mixture of analogue and digital inputs and control external devices via the analogue and digital outputs. Monitor pressure, temperature, light intensity, weight, switch state, movement, relays, etc. with the appropriate sensors (not supplied). Data can be processed, stored and the results used to control devices such as motors, sirens, relays, servo motors (up to 11) and two stepper motors.

Features

- 11 Analogue Inputs – 0-5V, 10 bit (5mV/step)
- 16 Digital Inputs – 20V max. Protection 1K in series, 5-1V Zener
- 1 Analogue Output – 0-2.5V or 0-10V. 8 bit (20mV/step)
- 8 Digital Outputs – Open collector, 500mA, 33V max
- Custom box (140 x 110 x 35mm) with printed front & rear panels
- Windows software utilities (3.1 to XP) and programming examples
- Supply: 12V DC (Order Code PSU203)

Kit Order Code: 3093KT – £64.95

Assembled Order Code: AS3093 – £94.95



Most items are available in kit form (KT suffix) or pre-assembled and ready for use (AS prefix).

Hot New Kits This Summer!

Here are a few of the most recent kits added to our range. See website or join our email Newsletter for all the latest news.

NEW! EPE Ultrasonic Wind Speed Meter



Solid-state design wind speed meter (anemometer) that uses ultrasonic techniques and has no moving parts and does not need

calibrating. It is intended for sports-type activities, such as track events, sailing, hang-gliding, kites and model aircraft flying, to name but a few. It can even be used to monitor conditions in your garden. The probe is pointed in the direction from which the wind is blowing and the speed is displayed on an LCD display.

Specifications

- Units of display: metres per second, feet per second, kilometres per hour and miles per hour
- Resolution: Nearest tenth of a metre
- Range: Zero to 50mph approx.

Based on the project published in *Everyday Practical Electronics*, Jan 2003. We have made a few minor design changes (see website for full details). Power: 9VDC (PP3 battery or Order Code PSU345).

Main PCB: 50 x 83mm.

Kit Order Code: 3168KT – **£34.95**

NEW! Audio DTMF Decoder and Display



Detects DTMF tones via an on-board electret microphone or direct from the phone lines through the onboard audio transformer. The

numbers are displayed on a 16-character, single line display as they are received. Up to 32 numbers can be displayed by scrolling the display left and right. There is also a serial output for sending the detected tones to a PC via the serial port. The unit will not detect numbers dialled using pulse dialling. Circuit is microcontroller based.

Supply: 9-12V DC (Order Code PSU345).

Main PCB: 55 x 95mm.

Kit Order Code: 3153KT – **£17.95**

Assembled Order Code: AS3153 – **£29.95**

NEW! EPE PIC Controlled LED Flasher



This versatile PIC-based LED or filament bulb flasher can be used to flash from 1 to 160

LEDs. The user arranges the LEDs in any pattern they wish. The kit comes with 8 superbright red LEDs and 8 green LEDs. Based on the Versatile PIC Flasher by Steve Challinor, *EPE Magazine* Dec '02. See website for full details. Board Supply: 9-12V DC. LED supply: 9-45V DC (depending on number of LED used). PCB: 43 x 54mm.

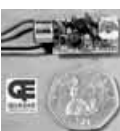
Kit Order Code: 3169KT – **£11.95**

Most items are available in kit form (KT suffix) or assembled and ready for use (AS prefix)

FM Bugs & Transmitters

Our extensive range goes from discreet surveillance bugs to powerful FM broadcast transmitters. Here are a few examples. All can be received on a standard FM radio and have adjustable transmitting frequency.

MMTX' Micro-Miniature 9V FM Room Bug



Our best selling bug! Good performance. Just 25 x 15mm. Sold to detective agencies worldwide. Small enough to hide just about anywhere.

Operates at the 'less busy' top end of the commercial FM waveband and also up into the more private Air band.

Range: 500m. Supply: PP3 battery.

Kit Order Code: 3051KT – **£8.95**

Assembled Order Code: AS3051 – **£14.95**

HPTX' High Power FM Room Bug

Our most powerful room bug.

Very Impressive

performance. Clear and stable output signal thanks to the extra circuitry employed.

Range: 1000m @ 9V. Supply: 6-12V DC (9V PP3 battery clip supplied). 70 x 15mm.

Kit Order Code: 3032KT – **£9.95**

Assembled Order Code: AS3032 – **£17.95**

MTTX' Miniature Telephone Transmitter



Attach anywhere

along phone line.

Tune a radio into the signal and hear

exactly what both parties are saying.

Transmits only when phone is used. Clear, stable signal. Powered from phone line so completely maintenance free once installed. Requires no aerial wire – uses phone line as antenna. Suitable for any phone system worldwide. Range: 300m. 20 x 45mm.

Kit Order Code: 3016KT – **£7.95**

Assembled Order Code: AS3016 – **£13.95**

3 Watt FM Transmitter



Small, powerful FM transmitter. Audio preamp stage and three RF stages deliver 3 watts of RF power. Can be used with the electret

microphone supplied or any line level audio source (e.g. CD or tape OUT, mixer, sound card, etc). Aerial can be an open dipole or Ground Plane. Ideal project for the novice wishing to get started in the fascinating world of FM broadcasting. 45 x 145mm.

Kit Order Code: 1028KT – **£23.95**

Assembled Order Code: AS1028 – **£31.95**

25 Watt FM Transmitter

Four transistor based stages with a Philips BLY89 (or equivalent) in the final stage. Delivers a mighty 25 Watts of RF power. Accepts any line level audio source (input sensitivity is adjustable). Antenna can be an open dipole, ground plane, 5/8, J, or YAGI configuration. Supply 12-14V DC, 5A. Supplied fully assembled and aligned – just connect the aerial, power and audio input. 70 x 220mm.

Order Code: AS1031 – **£134.95**



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Electronic Project Labs

Great introduction to the world of electronics. Ideal gift for budding electronics expert!

500-in-1 Electronic Project Lab

This is the top of the range and is a complete electronics course taking you from beginner to 'A' level standard and beyond! It contains all the parts and instructions to assemble 500 projects. You get three comprehensive course books (total 368 pages) – *Hardware Entry Course*, *Hardware Advanced Course* and a micro-computer based *Software Programming Course*. Each book has individual circuit explanations, schematic and assembly diagrams. Suitable for age 12 and above. Order Code EPL500 – **£149.95**

30, 130, 200 and 300-in-1 project labs also available – see website for details.

Number 1 for Kits!

With over 300 projects in our range we are the UK's number 1 electronic kit specialist. Here are a few other kits from our range.

- 1046KT – 25W Stereo Car Booster £29.95
- 3087KT – 1W Stereo Amplifier £6.95
- 3105KT – 18W BTL mono Amplifier £9.95
- 3106KT – 50W Mono Hi-fi Amplifier £23.95
- 3143KT – 10W Stereo Amplifier £10.95
- 1011-12KT – Motorbike Alarm £12.95
- 1019KT – Car Alarm System £12.95
- 1048KT – Electronic Thermostat £9.95
- 1080KT – Liquid Level Sensor £6.95
- 3003KT – LED Dice £7.95
- 3006KT – LED Roulette Wheel £9.95
- 3074KT – 8-Ch PC Relay Board £24.95
- 3082KT – 2-Ch UHF Relay £30.95
- 3126KT – Sound-Activated Relay £8.95
- 3063KT – One Chip AM Radio £11.95
- 3102KT – 4-Ch Servo Motor Driver £15.95
- 3155KT – Stereo Tone Controls £11.95
- 1096KT – 3-30V, 5A Stabilised PSU £32.95
- 3029KT – Combination Lock £7.95
- 3049KT – Ultrasonic Detector £14.95
- 3130KT – Infra-red Security Beam £13.95
- SG01MKT – Train Sounds £6.95
- SG10 MKT – Animal Sounds £5.95
- 1131KT – Robot Voice Effect £9.95
- 3007KT – 3V FM Room Bug £6.95
- 3028KT – Voice-Activated FM Bug £11.95
- 3033KT – Telephone Recording Adpt £8.95
- 3112KT – PC Data Logger/Sampler £18.95
- 3118KT – 12-bit Data Acquisition Unit £49.95
- 3101KT – 20MHz Function Generator £69.95

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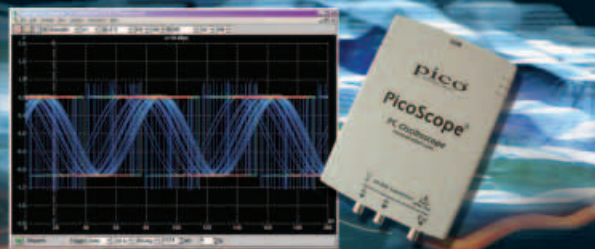


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PicoScope 3000 Series PC Oscilloscopes

The PicoScope 3000 series oscilloscopes are the latest offerings from the market leader in PC oscilloscopes combining high bandwidths with large buffer memories. Using the latest advances in electronics, the oscilloscopes connect to the USB port of any modern PC, making full use of the PCs' processing capabilities, large screens and familiar graphical user interfaces.

- High performance: **10GS/s** sampling rate & **200MHz** bandwidth
- **1MB** buffer memory
- High speed **USB 2.0** interface
- Advanced display & trigger modes
- Compact & portable
- Supplied with PicoScope & PicoLog software



PicoScope	3204	3205	3206
Bandwidth	50MHz	100MHz	200MHz
Sampling rate (burst)	2.5GS/s	5GS/s	10GS/s
Sampling rate (single shot)	50MS/s	100MS/s	200MS/s
Channels	2+Ext trigger	2+Ext trigger/Sig gen	2+Ext trigger/Sig gen
Oscilloscope timebases	5ns/div to 50ns/div	2ns/div to 50ns/div	1ns/div to 50ns/div
Timebase accuracy	50ppm	50ppm	50ppm
Spectrum range	0 to 25MHz	0 to 50MHz	0 to 100MHz
Buffer memory size	256KB	512KB	1MB
Resolution / accuracy	8 bits / 3%		
Range	±100mV to ±20V		
PC Connection	USB2.0 (USB1.1 compatible)		

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TEKTRONIX 2247A 4 Channel 100MHz	£275
TEKTRONIX 2235 Dual Trace 100MHz Delay Sweep	£125
TEKTRONIX 485 Dual Trace 350MHz Delay Sweep	£300
WATSU SS5711 4 Channel 100MHz Delay Sweep	£150
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PHILIPS 3065 2+1 Channel 60MHz Dual TB/Delay - Autoset	£150
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HITACHI V223 Dual Trace 20MHz	£60
HITACHI V222 Dual Trace 20MHz	£50
HITACHI V212 Dual Trace 20MHz	£50
FARNELL DTV12-14 Dual Trace 12MHz	£40

STORAGE

PHILIPS PM3320 Dual Trace 200MHz 250MS/s	£300
LECROY 9400 Dual Trace 125MHz	£325
TEKTRONIX 468 Dual Trace 100MHz Delay Sweep Digital Storage	£200
VELLEMAN HP55 1MHz 5MHz Sampling, Handheld Unused	£60

ANALYSERS

ADVANTEST R3265A 10kHz-8GHz	£4500
TEKTRONIX 499P 30kHz-2GHz	£2250
HP8590A 50Hz-2.0GHz Built In Tracking Gen	£2500
HP 8560A 50Hz-2.0GHz	£2950
HP 8569A 10MHz-22GHz	£950
HP 8565A 10MHz-22GHz	£750
HP 853A with 8559A 100kHz-2GHz	£1100
HP 1621 with 8559A 100kHz-2GHz	£750
HP1627 with 8558B 100kHz-1500MHz	£800

HP 182T with 8557A 10kHz-350MHz	£300-£400
HP 140T with 8555A 10MHz-18GHz	£500
ADVANTEST TR4131 10kHz-3.5GHz	£950
WAYNE KERR SSA1000A 150kHz-1GHz	£950
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MARCONI 2370 30Hz-110MHz	£500
HP 8754A Network Analyser 4-1300MHz	£500
MARCONI 6500A Amplitude Analyser with head	£750
HP 334A Distortion Analyser 5Hz-600kHz	£100

SIGNAL GENERATORS

HP 8350B Sweeper with 83592B 10MHz-20GHz	£1500
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HP 83525B RF Plug-in for 8350 0.01-8.4GHz	£500
HP 83580A RF Plug-in for 8350 2-20GHz	£900
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HP 8660C Sig Gen 2.6GHz	£750
HP 86603A Plug-in for 8660C 1-2600MHz	£500
HP86631B Auxiliary Section for 8660C	£500
HP86632B Modulation Section for 8660C	£500
MARCONI 2017 0.01-124MHz Low Phase Noise	£500
MARCONI 2019 Synthesised AM/FM 80kHz-1040MHz	£325
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HP 8656A Synthesised 0.1-990MHz	£400
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HP 8620C Sweep Osc with 8620B 2-18.6GHz	£500
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HP 86220A Plug in 10-1000MHz	
HP 86230B Plug in 1.5-4GHz	
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HP 86240A Plug in 2-8.5GHz	
HP 86240C Plug in 3-6-8GHz	
HP 86245A Plug in 5.9-12.4GHz	
HP86250B Plug in 8-12.4GHz	
HP 86250D Plug in 8-12.4GHz	
HP 86250A Plug in 12.4-18GHz	
MARCONI 172015 AM/FM 10-520MHz	£95
MARCONI 172016 AM/FM 10kHz-120MHz	£95
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WAVETEK 23 Synthesised Function Gen 12MHz	£275
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ANALOGUE 2030 Synthesised Multi Function Waveform	£250
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THUNDER TG503 Sweep Func Gen 0.0003Hz-3MHz	£150
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PHILIPS PM5131 Function Gen 0.1Hz-2MHz	£75
FEEDBACK FG601 Func Gen 0.001Hz-1MHz	£60
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BECKMAN UC10A Universal Counter 120MHz	£60
LEADER LDC3043 Digital Counter 100MHz	£125

DIGITAL MULTIMETERS etc

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SOLARTRON 7150Plus As Above + Temp Measurement	£100
DATRON 1065 5 1/2 digit Autocal AC/DC Resistance IEEE	£95
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FLUKE 77 Series 2 3/2 digit Handheld	£45
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SOLARTRON 7045 4 1/2 digit Bench	£60
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AVO 8 Mk5 with Leads etc.	£50
RACAL 5301A True RMS RF Millivoltmeter	£125
RACAL 5300 True RMS Millivoltmeter 5Hz-20MHz usable to 60MHz	£30
RACAL 9300B as 9300.	£40
GOODWILL GV7427 Dual Chan AC Millivoltmeter 10mV in 12 ranges 10Hz-1MHz Unused	£75
KENWOOD VT176 Dual Chan Millivoltmeter	£40

POWER SUPPLIES

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FARNELL L730-2 0-30V 0-2A Twice	£110
FARNELL B0320 30V 20A Variable No Meters	£110
FARNELL B3010 30V 10A Variable No Meters	£55
FARNELL L730-1 0-30V 0-1A Twice	£75
FARNELL L30-2 0-30V 0-2A	£55
FARNELL L30-1 0-30V 0-1A	£40
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RACAL 9916 Counter 10Hz-520MHz	£75
RACAL 9906 Universal Counter 200MHz	£95
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RACAL 1991 Counter/Timer 160MHz 9 digit	£195
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Super design. Regulated output and efficient circuit. Dual scale meter, compact case. Reads up to 200 Megohms. Kit includes wound ferrite transformer, drilled and punched case, meter scale, PCB & ALL components. (Needs PP3 battery).

KIT 848...£32.95

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An excellent kit for this project based on the EPE March 97 Design. Our Full Kit includes all components, hardware and an improved Magenta pcb. All hardware and electrodes are included. Designed for simple assembly and testing, providing a high level controlled dual output drive.

KIT 866 .. £32.90

Inc. 4 electrodes

Set of 4 Spare
Electrodes £8.50

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Stable Sensitive Pulse Induction detector. Easy to build and use. No ground effect - works in sea water. Detects Gold Silver, ferrous and non-ferrous metals. Kit includes Headphones, coil and all Hardware

KIT 847 ... £63.95

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Two Ultrasonic PEST Scanners. KIT 812 produces regular high level pulses of 32kHz. KIT 867 produces Random pulses and can work with an optional slave unit to give two separate ultrasound sources. Both kits need 9V supply.

Kit 812 ... £14.81 psu . 3.99

Kit 867 ... £19.99 867Slave £12.51

MOSFET MKII Bench PSU 0-25V 2.5A

Based on Mk1 design, with switching pre-regulator for high efficiency. Panel meters for A and V. Toroidal transformer. Variable Volts 0 - 25 AND Variable Current limit from 0-2.5A.

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- Full kit with ALL hardware and electronics.
- As featured in EPE Feb '03 (KIT 910)
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- Spins and reverses when 'cornered'.
- Uses 8 pin PIC chip
- ALSO KIT 911 - As 810 PLUS programable from PC serial port leads and software CD included.

BRAINBOT



KIT910...£16.99

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PIC PIPE DESCALER

- SIMPLE TO BUILD**
 - SWEEP FREQUENCY OUTPUT**
 - HIGH POWER**
 - AUDIO & VISUAL MONITORING**
- An affordable circuit which sweeps the incoming water supply with varying frequency electromagnetic signals. May reduce scale formation, dissolve existing scale and improve the way salts in the water behave. Kit includes case PCB coupling coil and all components. High coil current ensures maximum effect. LED and piezo monitor.

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KIT 790 £29.90

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- 16 Character x 2 Line display, pcb, programmed PIC16F84, software disk and all components to experiment with standard intelligent alphanumeric displays. Includes full PIC source code which can be changed to match your application.
- Learn how to drive the display and write your own code.
- Ideal development base for meters, calculators, counters, timers - just waiting for your application
- Top quality display with industry standard driver, data and instructions

KIT 860...£19.99

PIC STEPPING MOTOR DRIVER

PCB with components and PIC16F84 programmed with demonstration software to drive any 4 phase unipolar motor up to 24 Volts at 1 Amp. Kit includes 300 Step Hybrid Stepping Motor. Full software source code supplied on disc. Use this project to develop your own applications. PCB allows 'simple PIC programmer' 'BEND' software to be used to reprogram chip.

KIT 863.....£18.99

8 CHANNEL DATA LOGGER

From Aug/Sept '99 EPE. Featuring 8 analogue inputs and serial data transfer to PC. Magenta redesigned PCB - LCD plugs directly onto board. Use as Data Logger or as a test bed for developing other PIC16F877 projects. Kit includes led, programmed chip, PCB, Case, all parts and 8 x 256k EEPROMs

KIT 877.....£49.95

SUPER PIC PROGRAMMER

Magenta's original parallel port programmer. Runs with downloaded WINDOWS 95 - XP software. Use standard Microchip .HEX files. Read/Program/Volts wide range of 18,28, and 40 pin PICs. Including 16F847/876/877, 8278, (Inc. 'A' versions) + 18xx OTPs.

KIT 862. £29.99 Power Supply £3.99

ICEBREAKER



PIC Real Time In-Circuit Emulator

With serial lead & software disk, PCB, Breadboard, PIC16F877, LCD, all components and patch leads.

KIT 900...£34.99 PSU £3.99

ICEBreaker uses PIC16F877 in-circuit debugger functions.

Featured in EPE Mar '09 Ideal for beginners & experienced users. Windows (95 to XP) Software included

20W Stereo Amp.

EPE May '05 - Magenta Stereo/Mono Module

Wide band Low distortion 11W / channel Stereo 20W Mono. True (rms) Real Power



Short Circuit & Overheat Protected. Needs 8 to 18V supply.

Latest Technology - Stable, Reliable, high performance IC with local feedback.

KIT 914 £11.90

(includes all parts & heatsink for stereo or mono)

Magenta BrainiBorg

A super walking programmable robot with eyes that sense obstacles and daylight.

BrainiBorg comes with PC software CD (WIN95 & XP) with illustrated construction details, and can be programmed to walk and respond to light and obstacles on any smooth surface.

Kit includes all hardware, components, & 3 motor/gearboxes. Uses 4 AA batteries (not supplied).

KIT 912 ... £49.99 (Kit with CD Rom & Serial Lead)

KIT 913 ... £58.95 (As 912 but Built & Tested Circuit board)

EPE PIC Toolkit 3

As in EPE Apr/May/Jun '03 and on PIC Resources CD

- Magenta Designed Toolkit 3 board with printed component layout, green solder mask, places for 8,16, 28 (wide and slim), and 40 pin PICs, and many Magenta extras. Also runs with WinPic800 prog. Software.
- 16 x 2 LCD, PIC chip all parts and sockets included.
- Follow John Becker's excellent 'PIC toolkit 2' series.

KIT 880 ... £34.99 (With 16F84 Chg)

KIT 880 ... £39.99 (With 16F877 Chg)

OR - Built & Tested £49.99 & £55.99

EPE TEACH-IN 2004

COMPLETE 12 PART SERIES FROM NOV03 Additional Parts as listed in 'misc.' Section (pass RF modules, Lock, and Motorbox)

All parts to follow this Educational Electronics Course. Inc. Breadboard, and wire, as listed on p752 Nov 03'

KIT920...£29.99

KIT921...£12.99

Reprints £1.00 per part.

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Magenta's Super Heterodyne Bat detectors. Our best selling kit 861 now includes a drilled case and front panel label. The MkIIb and digital MkIII are supplied built & ready to go

KIT 861 .. £34.99

MkIIb .. £49.95

Soft Zip Up Pouch for kit 3...£5.99

MkIII .. £89.95

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Also available are similar boards for the 8051, AVR and dsPIC, each at the same great price of £99 - please telephone or see our website for further details.

EasyPIC3 Starter Pack features:

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- On-board I/O devices including switches, LEDs, seven-segment displays, potentiometers and RS-232 interface. Now also features USB and PS/2 keyboard interface connectors.
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- All I/O lines available for off-board expansion.
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Kit supplied with PCB and all electronic components with clear English instructions.

- Car must be fitted with air flow and EGO sensors (standard on all EFI systems) for full functionality.

- Recommended box UB3 HB-6014 £1.40



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KJ-8750 £6.50 + post & packing

The circuit board may measure just 70(L) x 17(W)mm, but it can transmit signals over a kilometre in the open. It has flexible power requirements, with 6 to 12VDC input voltage (a 9V battery would be suitable). It is quick to build, and fun to use. Kit supplied with circuit board, electronic components, and clear English instructions.

- Recommended box UB5 HB-6015 £0.83



Starship Enterprise

Door Sound Simulator

KC-5423 £11.75 + post & packing

Emulate the unique sound made when the cabin doors on the Starship Enterprise open and close. It can be triggered by switch contacts, which means you can use a reed magnet switch, IR beam or PIR detector. Kit includes PCB with overlay, case, all electronic components and clear English instructions.

- Requires 9-12VDC power

NEW FOR '06



For all you Trekkie fans

Universal High Energy Ignition Kit

KC-5419 £27.75 + post & packing

A high energy 0.9ms spark burns fuel faster and more efficiently to give you more power! This versatile kit can be connected to conventional points twin points or reluctor ignition systems. Kit includes PCB, case and all electronic components with clear English instructions.



We stock an extensive range of quality automotive kits

NEW FOR '06

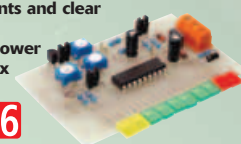
Voltage Monitor Kit

KC-5424 £6.00 + post & packing

This versatile kit will allow you to monitor the battery voltage, airflow meter or oxygen sensor in your car. It features a 10 LED bargraph that lights the LEDs in response to the measured voltage, preset 9-16V, 0-5V or 0-1V ranges complete with a fast response time, high input impedance and auto dimming for night driving. Kit includes PCB with overlay, LEDs, all electronic components and clear English instructions.

- Requires 12VDC power
- Recommended box UB5 HB-6015 £0.83

NEW FOR '06



Tempmaster Kit

KC-5413 £11.75 + post and packing

Need accurate temperature for a wine cooler or beer brewing heater?

This project turns a regular fridge or freezer into a wine cooler by accurately controlling the temperature to make it suitable for wine storage. A much cheaper option than commercial units. Kit supplied with PCB, case, mains plug & all electronic components.

Australian to UK mains adaptor required.

Use PP-4020 £2.95

NEW FOR '06

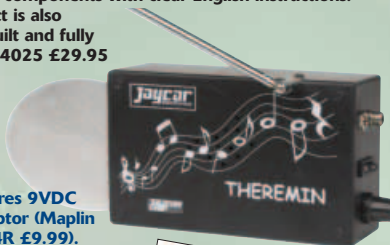


Theremin Synthesiser Kit

KC-5295 £14.75 + post & packing

The Theremin is a strange musical instrument that was invented early last century but is still used today. The Beach Boys' classic hit 'Good Vibrations' featured a Theremin. By moving your hand between the antenna and the metal plate, you can create unusual sound effects. Kit includes a machined, silkscreened, and pre-drilled case, circuit board, all electronic components with clear English instructions.

- This product is also available built and fully tested AM-4025 £29.95



Requires 9VDC wall adaptor (Maplin #GS74R £9.99).

Battery Zapper MkII

KC-5427 £29.00 + post & packing

The circuit produces short bursts of high level energy to reverse the damaging sulphation effect in wet lead acid cell batteries. This improved unit features a battery health checker with LED indicator, circuit protection against badly sulphated batteries, test points for a DMM and connection for a battery charger. Kit includes machined case with screenprinted lid, PCB with overlay and all electronic components with clear English instructions.

- Suitable for 6, 12, and 24V batteries.
- Requires 9-12VDC power

NEW FOR '06



Battery Zapper Add-On Kit

KC-5428 £17.50 + post & packing

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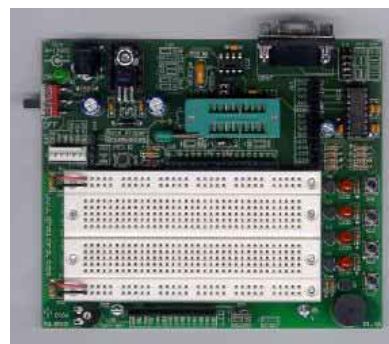
A range of New PIC development boards priced from just £4.00 !

We have a range of 5 new PIC project boards - all available as bare PCB's or as pre-built boards with components. They all have space for the PIC microcontroller, (from 8 to 40 pins). Support circuitry includes the 5V power regulator, decoupling components, reset circuitry and a crystal oscillator. Included are basic I/O components including, LEDs, push-buttons, and a piezo buzzer plus RS232 drivers and DB9F serial connectors. All boards have a large circuit prototyping areas for your designs. The boards all feature a compatible 6 pin in circuit programming connector.

The most comprehensive board (lower left) offers a ZIF socket and breadboard area, plus LCD connection which is ideal for experimental and educational users.

Ideal for use with WIZ-C Lite (below).

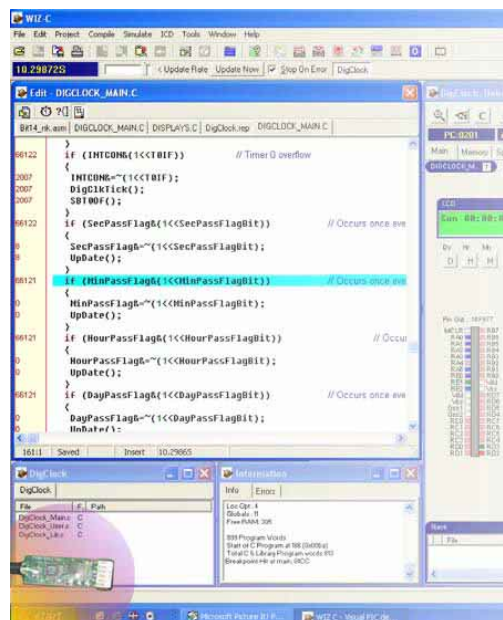
See www.fored.co.uk for further details



Serial+ Programmer (Right). New programmer handles 12C, 12F, 16C, 16F, 18F devices from 8 to 40 pins includes In Circuit Serial Programming connector and In Circuit Debugger function. Fully built and tested at just £35.00

WIZ-C Lite – complete ANSI C Compiler for the PIC together with RAD front end

Lighting fast C development at an affordable price



- WIZ-C is more than a C Compiler for the PIC – it is a complete development environment with rapid access to library components with point and click set up.
- Ideal for beginners, includes full tutorial manuals and an introductory manual to the C language.
- Syntax highlighting editor.
- Full ANSI C Compiler
- Large libraries included for displays, ports, data transfer, keypads, graphics, bootloader and C standard functions.
- Extensive simulation capabilities, very rapid program execution, includes simulation of LCD, LED' switches, I2C, RS232 terminals etc. Inspect C variables in C format
- Logic analyser can display waveforms of PIC pins and internal registers simplifying debugging.
- Includes assembler to allow you to develop assembler projects in their own right, or as part of C projects
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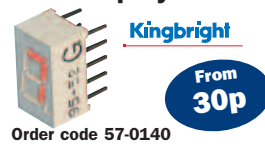
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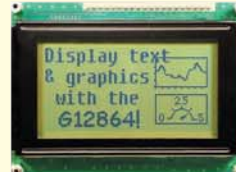


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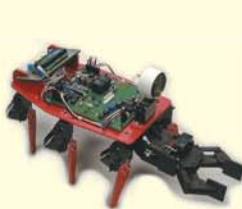
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