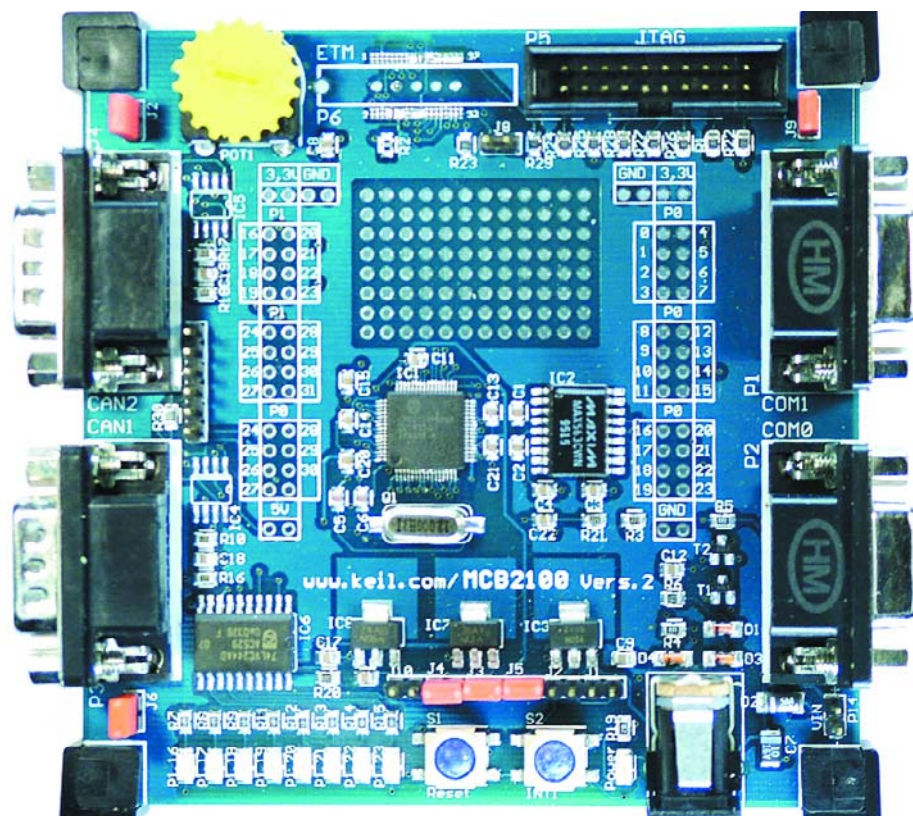


Low-cost ARM-7 kits from Hitex

Capitalising of the success of the Keil/Philips LPC900 8051 kits (see Elektor Summer 2003 Edition) Hitex UK has announced the Keil/Philips LPC2100 ARM-7 kits at £75. This is a remarkable price for a remarkable ARM kit.



ARM is the 32-bit IP core that is sweeping the 32-bit world like the 8051 did in the 8-bit world. Whilst the ARM core is not new, it has previously only been used as a core in ASICs and specialist parts, Philips have now released stand-alone ARM7 MCUs. The ARM LPC2100 range is designed to take over where the 8051 based LPC900 range leave off. In order to keep this transition as smooth as possible Philips are using the familiar Keil uVision3 system for both the LPC2100 and LPC900 development.

The basic LPC2100 kit contains the board and the Keil development package. The board sports an LPC2129 part with 16 kB RAM 256 kB Flash on board so no need of any additional memory. Code may run from either RAM or Flash. The LPC2129 has a wide range of peripherals on it including: ADC, GP-I/O, I²C, UARTs, CAN, SPI, Capture/com-

pare, PWM, two timers and a real-time-clock/calendar. One of the UARTs has all the signals required for MODEM control. This range of peripherals makes for a powerful single chip system. The board has, of course, a row of LED's and the traditional Keil 'Blinky' application, a patch area, both serial and CAN network are connectors fitted. The board is tracked for expansion connectors for the GPIO.

Hitex has a range of working software examples for board that are available on their web site. There is a boot loader on the part so programming and booting via the serial port is workable. However, as with all ARM parts there is a JTAG interface and unique to Philips ARM-7 is Trace. Hitex have a range of JTAG debuggers starting from a parallel port wiggler £50 to the full industrial systems with trace costing a little more. Whilst on the subject of debug-

ging, the Keil development suite (uVision3) that comes with the kit has a full ARM-7 simulator. This is limited to 16 kB (but *not* time limited) and will be suitable for most modest applications. The part that is not limited however is the GNU C and C++ compiler suite that is part of the package. So you can build applications of any size with this kit. In addition to the full ARM simulation Keil have the JTAG-USB debugger called ulink. This is usually £215 but Hitex are offering a complete kit of the MCB2100 board with the Keil uLink debugger for £250. This kit also includes the Hitex Hi-top ARM simulator and the Hitex ARM examples.

This is a very powerful 32-bit industrial development system at a fraction of the cost. The ARM-7 parts are used in all manner of applications from set top boxes to medical systems and many mobile phones. As one industry commentator said ARM is the

8051 of the 32-bit world. Academics should contact Chris Hills as Hitex can do some very special arrangements for supplying complete ARM Development labs with sets of MCB2100 boards, JTAG debuggers and Keil development suites as well as a wealth of additional resources for special academic prices. Whilst the LPC900 kits are suitable for 6th form colleges upwards the ARM kits are more suitable for Universities.

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(047120-1)

Enigma-E Kit hits Bletchley Park Museum

The Enigma-E developed by Dutchmen Marc Simons and Paul Reuvers is a DIY construction kit that enables you to build your own electronic variant of the famous Enigma coding machine that was used by the German army during World War 2.

The kit works just like a real Enigma and is compatible with an M3 and M4 Enigma as well as the standard Service Machines. A message encrypted on, say, a real Enigma M4 can be read on the Enigma-E and vice versa. The M4 (4-rotor) Enigma was used by the German Navy while the M3 version was the standard for the Luftwaffe and Ground Forces (Heer).

The makers

Paul Simons and Marc Reuvers run a microcontroller software company and are enthusiastic volunteers of the 'Jan Corver' Dutch Radio Amateur Museum near Eindhoven, the Netherlands. Marc and Paul are known for their brilliant, reverse-engineering and firmware conversions resulting in the re-use (by licensed radio amateurs) of ex-government surplus radio equipment (PMR), with the proceeds going to the Jan Corver Museum.

Enigma-E is yet another demonstration of Paul and Marc's ingenuity when it comes to translating concepts (this time, electromechanical encryption) into real electronics. This time, quite unexpectedly, the interest in their product was even greater in the UK than in their home country. Enigma-E is built around a PIC16F873 and runs software written by Marc using assembler rather than C or another high-level language in order to squeeze maximum functionality from the limited memory space available of just 4 kB Flash.

The kit

The kit comes complete with PCBs and all components, but

users will have to add a battery and make or purchase their own enclosure. A great example of how the Enigma-E electronics can be turned in a 'Secret Agent style' portable unit complete with operating instructions secured to the inside of the lid may be seen in the photograph. The plug-board, originally a 'military-only' add-on to the commercial Enigma machine, is mounted vertically.

The kit also comprises a 60+ page documentation package with lots of information not only on the construction of the double-sided and through-plated PCBs (and plans for the wooden case) but also on various design aspects and a small historical background to the Enigma machine.

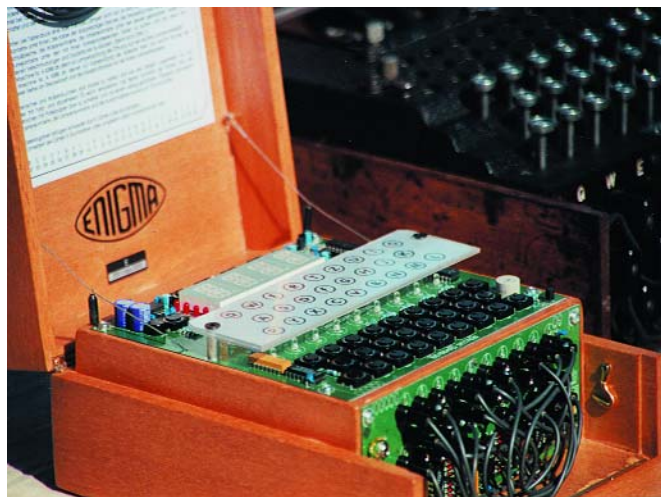
According to software wizards Marc and Paul, building the kit isn't difficult, but requires basic soldering experience. If you haven't soldered for a long time, or if you're new to electronics, you might want to practice first on some old electronic circuits. Alternatively, you could try to find an electronic enthusiast near you and ask for help.

Bletchley Park

Bletchley Park was the place where during WW2 the German armed forces top secret codes used for radio communication were broken by a team of mathematicians (including Alan Turing and Dilly Knox), providing the Allies with vital information towards their war effort.

The world's first programmable computer (all valved and called Colossus) and other technologies we take for granted today were initiated at The National Codes Centre Bletchley Park.

Thanks to the efforts of the Bletchley Park Trust, the historic buildings were saved from demolition and the park converted into a museum. Bletchley Park now provides attractive weekday and weekend programmes, theme exhibitions, lectures and much more that make



Enigma-E electronics housed in a beautifully tooled wooden case, with its electromechanical ancestor in the background.

an excellent day out for anyone, young and old, interested in cryptography, not necessarily within a historic framework. The Enigma-E Kit can be purchased at £119.99 in the Bletchley Park Shop.

(0471 22-1)

Web pointers

Enigma-E homepage:
www.xat.nl/enigma-e/

'Station X', the Bletchley Park Museum homepage:
www.bletchleypark.org.uk/

(left to right) Marc Simons, Paul Reuvers and Christine Large (MD, Bletchley Park), photographed (quite appropriately, we'd say) during the 'Wizards, Widgets and Weird Inventions' exhibition, at the same time celebrating the delivery the first batch of Enigma-E kits and a few demo units to the Museum.

Photograph: Dave Whitechurch, Bletchley Park Museum.



Ethernet enabled DOS controller

At only US\$ 98 per unit, JK microsystem's new picoFlash is a 186 compatible DOS computer with Ethernet whose performance rivals competitor's Ethernet-enables products for a fraction of the cost.

Slightly larger than a credit card, the picoFlash is a fully programmable, compact single board computer ideally equipped for data acquisition, industrial control and communications applications. Standard units feature a fast, 40-MHz RDC R8822 microprocessor, NE2000 compatible Ethernet, 512 k DRAM and 512 k Flash memory, two serial ports, 16 bits of I/O, hardware clock/calendar and a socket to expand non-volatile memory using M-systems DiskOnChip products. The preloaded royalty-free DOS operating system and Flash file system provide a fast

yet convenient environment for embedded development. Along with a watchdog timer, 5-V DC power, RS485 serial port capability, LCD support and aggressive pricing, the picoFlash single-board computer covers many embedded Ethernet designs for the OEM market.

Available development kits are US\$ 219 and include a picoFlash controller, necessary cables, Borland C/C++ version 4.52 compiler, driver libraries and documentation. Free technical support from JK microsystems' engineers is available via email or the new online Support Forums at <http://forums.jkmicro.com>

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95616, USA.

Internet: www.jkmicro.com

(047076-3)



Two into one does go

Alphasense claims to have introduced the smallest two-gas electrochemical sensor, onto the world market.

The D2 dual Carbon Monoxide and Hydrogen Sulfide sensor represents a significant development of the established "D" Family of sensors.

The D2 size, measuring only 14.5 mm (diameter) by 11.5 mm (height), encloses the companies well-proven electrochemical technology for both CO and H₂S measurement. The design of this miniature sensor ensures that the CO measurement is not influ-

enced by the presence of H₂S in either the atmosphere being monitored, or in multi-component calibration gas mixtures.

The advance made by Alphasense in sensor packaging provides Original Equipment Manufacturers (OEMs) with the opportunity to design lighter and smaller multigas instrumentation, now being demanded by users. A further major advantage for volume instrument manufacturers, is a significant reduction in the cost per measured gas provided by the D2 dual gas sensor.

The 'D Family' continues to grow

— not just with the introduction of this unique dual gas sensor, but also by two additional single gas versions. Both Chlorine and Nitrogen Dioxide are now available in this miniature size, adding to Carbon Monoxide and Hydrogen Sulfide, with more sensor types planned over the coming year, giving OEMs the ability to further reduce size and price for their next generation of instruments.

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(047076-4)

The internet site for all professionals and hobbyists
actively engaged in electronics and computer technology

www.elektor-electronics.co.uk

Smaller, low-current SPI serial EEPROMs

Microchip's 8-Kbit 25XX080A/B and 16-Kbit 25XX160A/B are SPI bus-compatible serial EEPROM devices with a maximum clock speed of 10 MHz, a write time of 5 milliseconds, and a write current of 3 milliamps. These devices all feature self-timed ERASE and WRITE cycles, built-in write protection, and high reliability with 200-year data retention and one million erase/write cycles. They are available in small packages, such as the MSOP, alongside standard packages including TSSOP, PDIP and SOIC.

The 25XX080A/B and 25XX160A/B are available in two voltage ranges ("AA" in 25AA080B denotes 1.8 - 5.5V and "LC" in 25LC080B denotes 2.5 - 5.5V). Both industrial temper-

ature grade (-40°C to +85°C), and extended temperature grade (-40°C to +125°C) devices are available. In addition, both 16- and 32-byte page sizes are available. The 'A' versions (25LC080A and 25LC160A) feature 16-byte page size, while the 'B' versions (25LC080B and 25LC160B) feature 32-byte page size.

Microchip's SEEVAL® 32 Serial EEPROM Designer's Kit supports these new devices assisting system integration and hardware/software debug.

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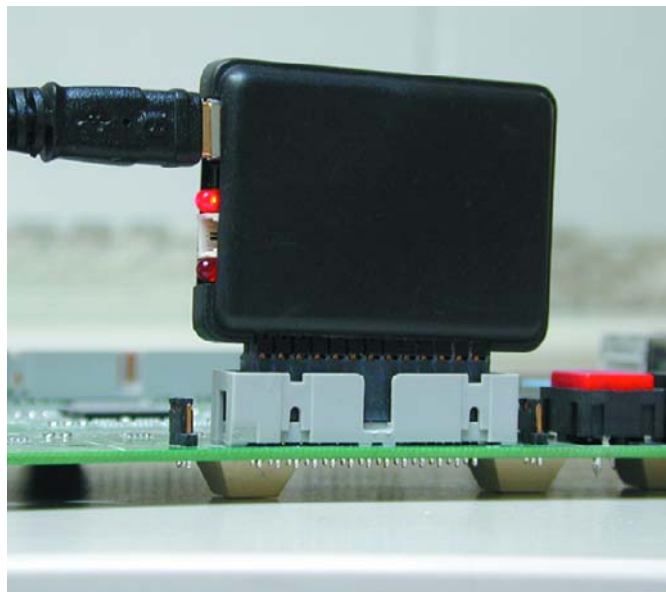
USB BDM debugger for Coldfire

Crossware has developed a USB BDM (background debug mode) debugger for Motorola's ColdFire family of chips.

The USB debugger provides significant advantages over a parallel port BDM interface by ensuring that the data transfer rates from the PC to the debugger are super fast. In addition, advanced synchronisation techniques have been used to optimise the data transfer from the debugger to the target board. Crossware has developed the small yet powerful and fast BDM debugger using the C8051F320 microcontroller from Cygnal (now part of Silicon Laboratories), which features a USB controller and requires no external crystal. The miniature debugger plugs directly into the target board minimising signal delays and ensuring that it will be compatible with the next generation of ColdFire chips running at up to 200 MHz.

The USB debugger is driven by new version of Crossware's source level debugging software, which integrates seamlessly with the rest of its ColdFire Development Suite. The user interface is unchanged and so developers can simply replace their existing parallel port interface with the new USB debugger and immediately benefit from the improved performance. In addition, developers can also move to platforms such as the newer generation of notebook PCs, which do not have a parallel port.

The debugger evolved out of a new version of Crossware's 8051 Development Suite. This version featured Code Creation Wizards to allow the USB controller and other peripherals of the C8051F320 to be rapidly configured. Using this as starting point, and by combining its thorough knowledge of both the C8051F320 microcontroller and



the ColdFire BDM interface, Crossware has been able to leverage the complementary features to create a super fast USB BDM debugger.

(047076-6)

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