

# The Embedded Newsletter

Autumn 2002

## USB Special

I have been saying for some time that USB is the ideal interface mechanism both for development tools and also for applications that require a micro and a PC to communicate. So I thought this was a good opportunity to show what's available.

### USB RomEmulator



A new product, the RomEm demonstrates that as well as being low cost, USB can knock the socks off the parallel port for transfer speed. This loads 1 Mbyte in around 1.5 seconds and as the memories we use get bigger and bigger the difference between that and the COM: ports average speed of 100Kbytes/sec makes all the difference when waiting to test that latest program change. Prices start at less than £400 with the largest size being 1MByte.

### Using USB in Applications

Getting the micro end of a USB link running is one thing but how do you write the PC end? Well, Jungo USB WinDriver makes it easy by providing an interactive shell for initial testing, a simple API for controlling the USB link and a debug monitor for detailed application tests. It can support normal pipes (the standard communications channels between the PC and the micro), Isochronous channels for fast guaranteed bandwidth and Plug and Play operations.

*See over for more USB...*

### Support for XScale

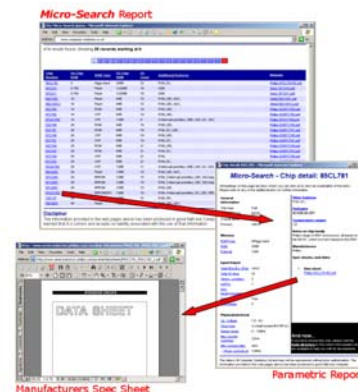
The Abatron BDI2000 now supports the latest Intel ARM based processors providing breakpoints and debugging information either for the ARM development system or for GDB and the GNU cross compiler GCC.

### Website Major Upgrade

Well, we have spent the whole summer beavering away on the website to provide you with more and better information arranged in a way that you can easily explore.

### New Micro-Search Format

By moving our database onto the web server and using ASP we have been able to significantly improve the layout and functionality of the Micro-Search report generator.



If you have not tried **Micro-Search** go along and you will find a number of useful selection criteria such as single chip or low power. Choosing one of these provides a table of 8051 chips with their data sorted by memory availability in the first case and power consumption in the second. Each chip's data can then be displayed and its spec sheet picked up if you need it.

*See over for more Web News...*

### USB makes Logic Analyser Portable

Our LA4000 series Logic Analyser can record data at up to 500MHz and can examine up to 160 channels. Up to now we have relied on an ISA card interface for the fast data transfer it needs to download this mass of data. Now it is available with a USB interface with no loss of performance. Using USB with only a cable connection makes it much easier to move between computers or to use with a portable.



### Talk to CAN via USB

The Peak PCAN-USB module can be used to monitor and debug CAN transactions. Alternatively, using VB or C++ and it's simple API, a PC will control a CAN network. Again USB makes for portability and speed.

### USB Interface for ICE

The iSYSTEM range of 8, 16, 32 bit BDM and JTAG ICE can now use USB or Ethernet interfaces in place of the conventional LPT: port. When loading the contents of the 400KByte trace buffer into the computer this is important as it increases performance by a factor of 8\* over the parallel port transfer rate.



### Programming the USB target

If you wish to implement anything more than a simple USB application on your target you are going to need both an RTOS and a USB stack. We can supply these for either Linux, Embedded x86, ARM, MIPS or PowerPC.

As well as supplying core USB communication links we can provide class drivers that control specific types of devices such as printers, mice and scanners.

### Micro-Search exceeds 500,

But a database is only as good as the quantity and quality of its data so we have been working on increasing our coverage as fast as the manufacturers add new chips we will have the details on our web site.

The **Micro-Search** database now has over 540 8051 family microprocessors with full parametric descriptions and pointers to their spec sheets.

### On Chip Peripherals

New **Micro-Search** reports allow you to quickly identify those chips that have either two serial ports or communication peripherals on chip such as I<sup>2</sup>C, CAN or SPI.

### Improved Navigation

If you have followed our web site's development you will know that it has exploded from 50 pages to over 1000 pages (85% of it in the information zone). Expecting you to know your way around has ceased to be an option! With our latest drop-down menu system you can now find your way to any product with a slide of the mouse and one click. But we hope you will still browse those areas of the site where we have collected useful engineering data to help you in the design phase of your project.

### Embedded Web

This is the area where we have put some of the most useful web links for your embedded design work; for your use of PCs; for creating websites and just for fun. It's had some major new categories added which we think you will find useful.

### Information Zone

The information zone is where we supply a whole range of useful information for embedded engineers and over the next few newsletters we will be announcing more new features. But if you keep an eye on [www.computer-solutions.co.uk/info/](http://www.computer-solutions.co.uk/info/) you will be able to explore the Beta versions as soon as they are available – keep watching that space.

## RomEm - fast loading with USB

The RomEm® system allows you to quickly download your code from a PC via a USB, test your target system and make corrections instantly. Ultimately, it will help you to complete the debug process much more quickly.



- Up to 1024Kbyte EPROM's can be Emulated
- Use in Byte, 16 or 32 bit Word modes
- Fast loading (1MByte in 1.5 second) through USB port

RomEm combines low cost with the convenience of USB interfacing. Because it interfaces via the USB port you can use it with either a portable or a static Lab PC. And USB means that it can be used with the latest operating systems such as XP. For those on a tight budget a parallel port version is also available but the OS's supported is limited.

**Devices supported:** Emulates 2716 up to 27080 EPROMS with a single unit. Configurations are available for 1MBit (128K x 8), 4MBit (512K x 8) & 8MBit (1024K x 8). Cascade RomEm units for more memory or for different word sizes.

32 pin DIP (.600) header is standard but a 28 pin cable option is also available.

**Access time:** Better than 100 ns.

**Reset:** A reset line is provided to connect to your target system. This can provide a normally high, low, or high-Z reset.

**Word modes:** 4 USB units can be run in parallel and the software allows their memory to be loaded as bytes, 16 or 32 bit words.

**Software supplied:** Available in two styles: a Windows GUI Application and a Windows Console-Mode command line version. The Windows GUI can be used to control up to 4 USB RomEm devices simultaneously. The command line software can be used for either USB or Parallel port devices. This simple command interpreter can be utilized interactively, or via batch files for automatic operation after assembling or compiling. Commands include Load, Fill, Write, Edit, and Dump. The EPROM type is software configurable and on line help is available for all commands. Full documentation with examples is included.

	USB Version	Parallel Port Version
Voltage	Emulates 5V, 3.3V or 2.7V via internal jumper options, or can be varied to anything in between via a potentiometer.	Emulates parts in a 5V system only.
Power	Includes a wall adapter, which can supply the regulated emulation voltage to the target system. Once loaded the PC and power supply can be removed as a Lithium battery provides sufficient power to maintain the memory image.	Operates via the supplied wall adapter, via an internal 9V battery (not included), or via your target system's 5V. In the first two cases, RomEm can also supply a regulated 5V for your target Vcc. Once loaded the PC and power supply can be removed if the 9V battery or target is providing power to maintain the memory image.
OS	Windows 98/SE/ME/2000/XP	DOS or Windows 95/98/SE/ME

RomEm with USB or parallel emulator available as 128Kbyte, 512Kbyte or 1024Kbyte

# PCAN-USB

## USB to CAN-Adapter for PCs

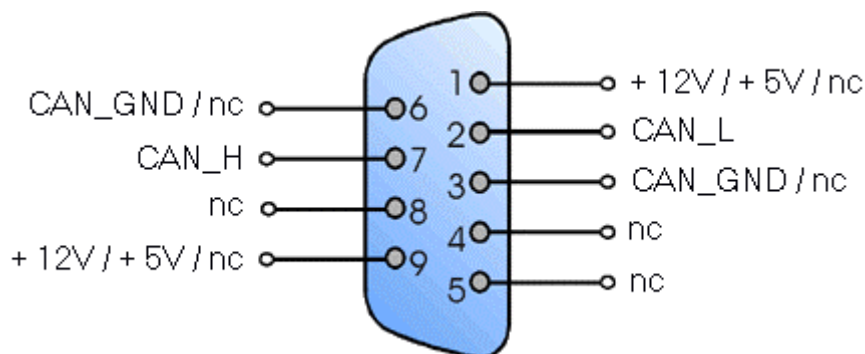


The PCAN-USB allows a simple and cost-effective connection to CAN-networks. It requires no external power supply. The USB adaptor supports the CAN-2.0A (standard frames) and 2.0B (extended frames) specification with a maximum baudrate up to 1MBaud. The small USB to CAN converter is ideal for use with laptops or notebooks. The PCAN-USB is distributed with Windows drivers and source code for PC based program development.

The PCAN-USB includes the SJA1000 CAN-controller and the 82C251 driver. The CAN-bus connection is via a 9-pin SUB-D plug, whose pin assignments correspond to the CiA-recommendation DS 102-1 (see figure below). The power supply for the PCAN-USB is taken from the USB port. The PCAN-Lite software package is included to drive the USB module from within Windows 98/ME/2K/XP. It provides simple interfaces to C++, VB, Pascal and Delphi. An active X component is also available. An optional set of VxD drives is available for time critical applications. The PCAN-Explorer Lite program provides a simple Windows based user interface for monitoring and controlling Can messages.

### Technical data

- Baudrate settings up to 1MBaud
- Equipped with Philips CAN-controller SJA1000
- Supports CAN specification 2.0A (standard frames) and 2.0B (extended frames)
- Hardware reset of the SJA1000 from software possible
- Constructed with space-saving port adapter
- CAN-Transceiver 82C251 (optional Low-Speed TJA1054)
- Connection via 9-pole DIN assignment according to CiA-recommendation DS 102



Pin assignment of the CAN-bus connector according to CiA-recommendation DS 102-1.