



Welcome

The year is rushing past even faster than usual and it's time for another update from Bluewater Systems.

As many of you will have read I handed over the reigns of Bluewater to new CEO Sarosh Dubash at the start of April. I am sure that under Sarosh's guidance Bluewater will enjoy continued success and growth. I will still be actively involved with Bluewater on a daily basis but will focus my attentions more on the company's core engineering projects. These have become significant of late, with Rig 200, more Snapper modules and a move into digital vision. In addition I will continue to help people in NZ / Aus reap the benefits of the latest technologies coming from ARM and ARM's partners.

With Rig 200 we have distilled most of our knowledge into a single product. With this in our customers' hands a vast array of applications can be developed quickly and easily. I look forward to seeing the uses to which this technology will be put in 2008.

I hope that your projects are going well and that 2007 is proving a profitable and fulfilling year.

Simon Glass, Founder

Company News

Bluewater has continued its growth through 2007 with the company now employing 13 fulltime staff. To accomodate the new faces we have taken additional office space on level 6 of the Price Waterhouse Coopers building in Christchurch. Be sure to come in and say Hi if you are every in the city.

During the year we have completed a number of designs for customers around the world. One of the more interesting and challenging of these has been the development of an on-board vehicle tracking and monitoring system. Using a wide range of technologies such as Bluetooth, GPS, GPRS and accelerometers, the device has

benefited from being able to incorporate our Snapper CL15 module. Now in full production and with potential customers around the world, it has been great to see another Kiwi company crack a major overseas market with a product that we helped to create.

In addition to this we have also been busy completing an extension to the Australian Dept. of Defence contract that we won in late 2005 and helping a number of Australasian based organisation develop products that are now going out into their respective marketplaces.

Staff Additions

Carl Smith

Carl joined Bluewater's software development team in April and brings with him a wealth of embedded software and design experience from Navman and Allied Telesyn.

Goran Balvan

Goran has joined Bluewater hardware development team as the lead hardware design engineer and brings many years of knowledge from companies such as Navman and Humanware.

Ryan Mallon

Having recently completed his Masters in Computer Science, Ryan worked with us on a short-term contract over the summer but impressed us so much that we offered him a fulltime position in the software team.

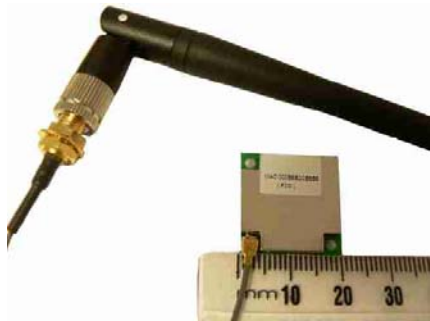
Embedded Technology Insight

WiFi

WiFi (or 802.11x) is the wireless equivalent of the ubiquitous Ethernet and is becoming more and more popular in embedded products. Until recently it has been difficult to embed the higher speed (802.11g) version into the products we design.

Earlier this year we located a suitable module with drivers for Linux which works well. It comes as a small module (20x20mm) with a micro antenna connector and is ideally suited to small systems. Power consumption is low, making it in keeping with the ARM technology that we use.

WiFi 802.11g has now been embedded into several designs including the new Rig 200 platform.

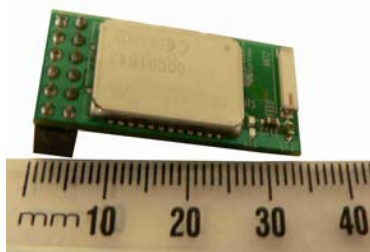


The WiFi option for Rig 200 is a very compact 802.11g module that is connected to a base PCB and to an external antenna

Bluetooth

While Bluetooth is mostly used in cellphones (to communicate with a headset or laptop), it also has uses in embedded systems. It can operate as a secure wireless link between two points, to replace USB or Ethernet, for example. Bluetooth typically operates at around 1Mbps, but 2Mbps and 3Mbps modules are now available which use USB rather than serial for the microcontroller connection.

Full software support for Bluetooth is present in Linux and WinCE, allowing serial data transfer, private area networking (PANs) and audio. A Bluetooth module option is available for Rig 200, which provides an easy way of trying out this technology in an embedded environment.



The above Bluetooth module is designed to be used as a snap-on option for Bluewater's Rig 200 development board. No antennae is needed

GPS

Global Positioning System (GPS) is a technology which allows a device to position itself anywhere on the planet where the sky is visible, typically to within a few metres of accuracy. GPS operates by using a network of satellites which broadcast very accurate timing information. By comparing the information from a number of satellites, a GPS receiver is able to pinpoint its location.

Bluewater has used GPS in several projects, often with an external antenna option to allow mounting on a vehicle or suitable enclosure position. Rig 200 includes GPS as a part of the Location Plus module.



The Location Plus module for Bluewater's Rig 200 provides a full GPS solution with an on-board or optional external antenna

NAND Module

As part of an internal R&D project, Bluewater has developed a very interesting and unique storage device. It is a solid state NAND storage module, holding up to 16GB per module. Modules can be stacked together to create very large, robust storage arrays with fast, reliable access.

An FPGA implementation of Bluewater's NAND RAID controller operates within a Snapper 255 module (or other module with FPGA) to provide the main control. Small low-power logic devices on each module manage the communication throughout the stack.

So far this technology has been used in the DDS XM-100 where two separate stacks provided a highly reliable RAID arrangement for the data. As the demand for storage capacity exceeds the available chip sizes, we see a good market for this sort of technology particularly in harsh environments where hard discs are not suitable.



The stackable NAND Flash module developed by Bluewater allows products with large amounts of solid state storage to be developed

Introducing the Rig 200

Rig 200 is a combined development kit and application board. It is aimed at supporting sophisticated software and hardware development, whilst its low cost allows it to be used in small quantities as a prototype, demonstrator or working model.

Rig 200 is designed to allow customers to use Bluewater's Snapper CPU modules (Snapper 255, Snapper 270 and Snapper CL15) for software development without needing to immediately develop a custom application board.

Once the software or hardware is proven using a Rig board, customers can then move to create a custom application board, knowing that the previous development done using Rig can move over to the new platform with very little or no change. This dramatically reduces the risk of a non-functional board, and also reduces the cost of development as proven circuits can be used. It also allows software development to proceed in parallel with hardware development, rather than being started only when a rev0 board is available.

Rig 200 is available at a low cost, so that it can be used in low-volume as a product prototype. This can significantly reduce the time taken to provide a working model thus assisting with concept testing, investor confidence and market development.

Rig 200 is a small board around the size of a computer CDROM drive (199 x 140 mm). It is available with a high quality metal enclosure which provides access to common features while providing a robust case for the board.



The Rig 200 provides a fully featured development kit including popular technologies such as WiFi, GPS and memory card support

Rig 200 includes a number of option boards. These are typically very small expansion boards which offer a particular function, such as Bluetooth or WiFi which is not required for all projects, and would be overly costly to include on the basic board.

Rig 200 also includes a carefully-specified expansion module interface. Various Rig 200 modules are available which provide useful expansion options in the areas of wireless, general I/O and storage. The module interface can be used as a means of connecting custom logic and includes a full system memory bus and access to FPGA pins (if fitted on the Snapper module).

www.bluewatersys.com/rig

The DDS-XM100 Data Storage Solution

Following on from the success of the NEC DSU that was developed by Bluewater to replace aging legacy tape back up units for Telecom New Zealand, we have been busy working on improvements to the unit and recently released the DDS-XM100 series.

The DDS-XM100 series is a modern, solid state data storage unit designed specifically to replace outdated magnetic tape and disk storage systems, such as those used with a wide range of telephone exchanges. The DDS-XM100 series can be configured to deliver up to 48 GB of solid state storage and connect to a wide range of devices via standard SCSI, Pertec or Kennedy interfaces.

In addition to offering data storage, DDS XM100 units can be easily networked to remove the need to transport the data physically. They also have external flash memory storage that enables the data to be loaded and archived on to 4GB removable SD cards.

Developed using our Snapper 255 module as the core of the unit and with stackable solid state memory, and external SD card storage the DDS-XM100

is extremely flexible technology. This combined with easy installation, operation and low requirement for maintenance, are crucial factors in the decision to buy the units by overseas telecommunication companies. Units have already been sold for use in New Zealand, Jamaica, the Philippines and Bhutan with strong interest from Sri Lanka, Thailand, and South America.



The DDS XM-100 uni showing the front panel with display and removable storage

www.bluewatersys.com/dd

RealView MDK v3.11

The new release of RealView MDK includes significant enhancements including:

New Features

- The New ARM RealView v3.11 compiler
- MicroLib optimized C library offering a >50% reduction in library code size
- Source Code browser allowing the display of variables and their definitions

Device Support

- STMicroelectronics STM32 - New Cortex-M3 based device families
- ARM Cortex-M1 - processor for FPGA implementation
- Luminary LM3Sxx - full simulation of devices and peripherals
- Atmel SAM7SE/X/XC - full simulation added
- NXP LPC2368/78 - full simulation

A full range of the devices supported is at: <http://www.keil.com/arm/chips.asp> and you can download a demonstration version of this kit at: <https://www.keil.com/arm/demo/eval/arm.htm>

We can lend you a U-Link 2 also during the evaluation period - please contact us for details.

Eclipse Plug-ins

ARM signalled with RVDS v3.0 that they are moving over to an IDE based on Eclipse. If you have not seen Eclipse, it might be worth a look - it is the IDE of choice for many large corporates. You can download it free of charge at: <http://www.eclipse.org/>

ARM has recently made available an ARM Flash Programmer plug-in for Eclipse which automatically creates flash algorithms and handles sending of images to a target. It can also export information on the flash device for close integration with RealView Debugger. This may save an hour or so of manual effort next time you work with a new ARM device.

There is also an ARM Assembler Editor plug-in for those who write large amounts of assembler code.

<http://www.arm.com/eclipse/index.html>

RVDS Tutorial

ARM has released a 33 page tutorial for RVDS 3.1 which describes how to use the command line tools and how to create and debug with Eclipse IDE and RealView Debugger (RVD). It only takes a short while to work through and may help to increase your productivity further.

<http://www.arm.com/support/tutorials/17674.html>

How many ARMs in an iPhone?



The degree to which ARM is now playing a major role in today's advanced mobile phones was emphasised when the new Apple iPhone was released in June. Touted as a major step forward in cellphone technology and functionality, the iPhone runs a cut down version of Apple's desktop OSX operating system and uses at least 3 ARM processors inside its tiny case.

So which ARM cores are used in the phone and what is the main CPU? No definitive answers have been forthcoming from Apple but the main processor has been seen to be a custom designed ARM11-based ASIC from Samsung. With Samsung providing Apple with their NAND flash needs (25% of the total world market) the choice of supplier may not be so surprising.

In addition to the main processor it is likely that the iPhone also utilises an ARM processor for both its WiFi (Marvel ARM 9 chipset) and baseband (Infineon ARM7 chipset) functionality, giving at least 3 ARM cores. Another will also be utilised in the Bluetooth controller, making a grand total of 4.



Are there really 4 ARM cores in the new iPhone?



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