

market are guaranteed. The current increase builds up multiplicity and creates a stronger division between power and mobile applications for industrial uses. Energy-efficient processor units are the basis to fulfil the requirements for small form factor mobile devices, providing basic computing such as internet on the go, e-mail, document viewing, process scanning, connectivity, streaming and upgradeability via downloadable applications, entering into industrial environments, where operating environments are much harsher. For portable devices, long battery life enabled by low basic energy consumption and elaborate battery management is an immediate cost-saving factor. In general, current-generation devices need to be intuitive and instantly usable, despite their richer and more complex functionality. Many previously external components can now be integrated into a single System-On-Chip. This tendency has resulted in a dramatic reduction in size and cost. With the Com-

puter-On-Module standard Qseven, all components of a PC system are available on a 70 x 70mm module. Based on the new Intel Atom E600 Series, it even fulfils automotive requirements with CAN Bus for data transfer, low power and improved graphics for e-car infotainment.

Future generations of even more powerful embedded multi-core processors with four and more physical cores will increase scalability up to top-range performance levels today. Even now, multi-core embedded ULV (ultra-low voltage) processors are available. They enable necessary functional and graphical extensions on small handhelds which until recently had been limited to AC-powered devices. When will the first real industrial pad appear on the market? With the benefits available today, multi-processor technology has now taken over the future of most electronic devices and continues to develop rapidly. ■

Microcontrollers under the regime of software

By **Stephan Zizala**, Infineon



■ What are microcontroller customers looking for? Performance and peripherals – yes of course; quality and reliability – no doubt about it; competitive prices – a must; but being able to provide an effective solution to cope with the growing complexity of embedded software – that will be the real competitive advantage. Surveys have shown that embedded software development is handled by increasingly large teams. But on the other hand the amount of projects finished in scheduled time is less than

50 percent. Software complexity and validation are two of the key issues in the embedded development community. Therefore an intelligent and flexible solution is needed. If all players on the market are using the same core, this would make the lives of compiler vendors much easier. But would this really significantly reduce complexity and development time for the embedded software designers? Probably not, as the main problem is due to the peripherals. With this in mind, tool-chains, libraries, auto-code generators and reference designs are getting more and more important. The future has to be microcontroller hardware which is optimized for software development, and not vice versa. Compilers and debuggers play an important role in making complex software manageable. Microcontrollers are no longer programmed in an assembly language, except for very time-critical tasks. Even most software for 8-bit MCUs is programmed in C or C++. On the other hand, designers – driven by productivity needs and challenging time-to-market – will pay for professional and powerful compilers and debuggers. But on the other hand, free tool-chains like the Infineon DAVEM Bench play a key role in the evaluation and development process:

You CAN get it...

Hardware & software for
CAN bus applications...

CAN bus diagnostics



NEW

PCAN-Diag

Handheld CAN bus diagnostics unit, 2-channel oscilloscope, measurement of CAN bit rate, termination, and bus load, symbolic message representation



PCAN-miniPCI

CAN interface for Mini PCI slots. Optionally with galvanic isolation. Available as Single channel or Dual channel version.



PCAN-Explorer 5

Universal CAN monitor, symbolic message representation, VBS interface, integrated data logger, functionality upgrades with add-ins (e.g. Instruments Panel Add-in).

www.peak-system.com

PEAK
System

Otto Roehrl-Str. 68
64293 Darmstadt / Germany
Phone: +49 6151 8173-20
Fax: +49 6151 8173-29
info@peak-system.com

-40°C / +85°C
Rugged CPU boards



PC/104 boards

CPC1600

PC/104-Plus Intel® Pentium® M

- Intel® Pentium® M processor up to 2.0 GHz
- 1 GB PC4200 DDR2 SDRAM soldered on board
- VGA, LVDS up to 2048x1536
- 16-bit ISA and 32-bit PCI buses
- Two Serial ATA channels, CF /I/I, 6 x USB 2.0
- Two Gigabit Ethernet ports
- 0°C to +70°C or -40°C to +85°C

CPC304

PC/104-Plus AMD® Geode™ LX800

- AMD® Geode™ LX800 processor; 500 MHz
- 256 MB soldered DDR SDRAM
- VGA, LVDS, LCD
- 16-bit ISA and 32-bit PCI buses
- IDE, CF /I/I, 2 x USB 2.0, 4 x COM ports
- Two 10/100-BaseT Fast Ethernet ports
- -40°C to +85°C

CPC306

PC/104-Plus DM&P Vortex86DX

- DM&P Vortex86DX processor; 600 MHz
- 256 MB DDR2 SDRAM
- 16-bit ISA and 32-bit PCI buses
- IDE, CF /I/I, 4 x USB, 2 x RS-232, 2 x RS-485/422
- Ethernet controller 10/100 Mb/s
- 72 Digital I/O, 8/2 Analog I/O
- -40°C to +85°C

firstly they make evaluation for customers easy and cheap, and secondly – acting as a catalyst – they set the minimum performance limit a commercial tool-chain must exceed, i.e. they help drive innovation in this field.

Software libraries are other helpful ingredients to make embedded software development more manageable, as they offload the developers from optimizing standard algorithms. Thus DSP libraries like the TriCore DSP library or low-level drivers are widespread. But a real breakthrough to effective embedded software development was the move from static libraries to a GUI-based microcontroller configuration tool like DAVE. Introduced almost a decade ago, it is still widely used and highly appreciated for configuring low-level drivers, especially for powerful peripherals. With the items mentioned so far, software developers still need to have a deep understanding of the microcontroller hardware. To overcome this, auto-code generators like DAVE Drive will play a key role in the future. DAVE Drive offers immense benefits for code generation for energy-efficient electric drives. Embedded software developers just select the right control algorithm for their chosen motor control topology and configure its parameters. The automatic code generator does the complete mapping to the specific microcontroller hardware. To support the increasing design complexity, powerful compilers and debuggers,

IP libraries and auto code generators will be complemented by reference designs such as the Infineon application kits for motor control, or the IO-Link kit for connectivity: They are optimally suited to allow software developers to test their software in real application setups including power stages, sensors, transceivers, or even a small motor. This eliminates the time to wait for the development of the target hardware. Even one step further, the software can be optimized and tested with such reference designs. The final hardware then can be optimized to the software, e.g. by selecting the microcontroller out of a family which fulfils the performance and cost needs. We expect that this trend will even accelerate. More and more powerful peripherals for analog-to-digital conversion, communication, connectivity etc will be integrated into microcontrollers. The main driver for this is cost, while microcontroller vendors will continue to differentiate on those peripherals. But the key topic in the future will be making the microcontroller hardware more flexible and configurable. This will enable platform solutions covering a much wider application range than is currently the case, supported by most microcontroller vendors. On the other hand this will make microcontrollers much more complex. And this is why GUI-based configuration tools, auto-code generators and reference designs will become even more important than they are today. ■

Product News

Hall.Stand A5.181

■ e2v: communications processor for extended-reliability applications

e2v has announced the availability of their P2020 extended-reliability version of Freescale's P2020 QorIQ™ integrated processor, for high performance power-sensitive applications in aerospace, defence and demanding outdoor environments. The P2020 integrated communications processor incorporates Dual Power Architecture e500 processor cores, operating at up to 1.2 GHz for extended-reliability environments including communications, networking and computation-intensive applications operating over temperatures from -55 to 125°C.

News ID 12611

Hall.Stand A5.542

■ ROHM: microstep motor drivers offer selectable excitation modes

ROHM Semiconductor expands its line-up of stepper motor drivers with its new BD63843EFV, BD63847EFV and BD63860EFV families offering selectable excitation modes - full-step to sixteenth-step with 1.0A or 2.0A

output current and full-step to eighth-step with 2.5A output current. The new microstep drivers enable designers to optimize motor torque, noise and vibration for a wide range of applications. Full-step mode is ideal for sets requiring large current for high torque, while eighth or sixteenth-step mode features a smooth output waveform for lower noise and vibration.

News ID 12618

Hall.Stand A5.260

■ Rutronik: high-speed data transfer with X-200 series from Swissbit

The X-200 series from Swissbit is an industrial 2.5 solid-state drive for new applications in the embedded and industrial segment. It features robust, tried and proven dimensions with high-speed data transfer. It is available in capacities from 4GB to 64GB, with writing and reading speeds of 90MB/s and 105MB/s respectively at distributor Rutronik now. The SSDs are also available in various temperature ranges: 0 to 70°C T_{Ambient} commercial standard temperature or -40 to +85°C T_{Ambient} for the industrial temperature range.

News ID 12619