

# Dedicated Systems' News

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## KONTRON CP6002 CPCI/PICMG 2.16 Intel® Core™i7 Rugged System/Peripheral SBC

### Inside this issue:

#### Page 2

- GNAT Pro High-Integrity Edition For VxWorks MILS Platform

#### Page 3

- Rugged DO-160 Avionics BusBox
- Seminar: DDS and Beyond

#### Page 4

- Conduction cooled ATRs for CPCI and VPX
- Training: An Introduction to COTS & Embedded Systems

The CP6002, a CompactPCI PICMG 2.16 compliant 6U CPU board, comes with various rugged levels, making it yet another addition to Kontron's rugged PICMG 2.16 portfolio. Based on the Intel® Core™ i7 processor and mobile chipset, the CP6002 features high computing and graphic performance with a low thermal power design and a complete set of data, communication and multi-media interfaces.

#### » Maximum Ruggedization

Designed to withstand even the toughest environmental conditions, the passively cooled CP6002 featuring up to 8 GByte of soldered RAM with ECC and a CompactFlash socket for industrial grade flash modules comes in the rugged levels – defined as R1 and R2. The R1 version is designed for standard application requirements in air-cooled environments. Air cooled Version R2 is available in extended temperature range from -40° C to +70° C. It is designed for high shock and vibration requirements as defined in VITA 47 EAC3/EAC6 (EAC6 requires special system components). The R3 version (available on project request) is fully conduction cooled and meets the VITA 47's ECC4 requirements.

The CP6002 features energy efficient embedded Intel® dual core processors. With the 2.53 GHz Intel® Core™ i7-610E and the LV 2.0 GHz Intel® Core™ i7-620LE, the CP6002 has extraordinary performance per watt values. Up to 8 GByte of soldered DDR3 1066 MHz memory with ECC provide the basis for demanding software applications. Based on the Intel® Mobile QM57 IO controller hub the CP6002 provides high graphics performance for VGA and two independent digital video outputs to the rear I/O as well as HDA audio capabilities.

#### » Comprehensive Versatility

The CP6002 offers comprehensive I/O capability with 4 x 1Gb Ethernet, 4 x rear IO SATA with RAID 0/1/5/10 functionality, a local SATA hard disk and SATA Flash disk connector, a CompactFlash socket as well as 6 x USB 2.0, 2 x COM, VGA and/or DVI. It can also accommodate a PMC/XMC slot and onboard 2.5" SATA HDD. A CP6002 with two PMC / XMC sockets is available for IO intensive applications. The CP6002 enables construction of a highly shock and vibration resistant systems with non-rotating, nonvolatile – write protectable - memory.

#### » Unique Security

The board provides safety and security via a trusted platform module, (TPM) 1.2, two redundant firmware hubs (failover) and IPMI (Intelligent Platform Management Interface) support (PICMG 2.9 R1.0).

#### » Long-term Availability

Delivering a stable product based on Intel®'s embedded product line the CP6002 ensures long-term availability.





## GNAT Pro High-Integrity Edition For VxWorks MILS Platform

A complete security application development environment for EALs 1 through 7

AdaCore, a leading supplier of Ada development tools and support services, announced the first major release of its **GNAT Pro High-Integrity Edition for MILS**. The High-Integrity Edition for MILS (Multiple Independent Levels of Security) product is a specialised security application development environment supporting the creation and security certification of applications at the high end for EALs (Evaluation Assurance Levels) 5 through 7, as well as applications at the lower bounds for EALs 1 through 4. This product contains several specialised run-time libraries that support different levels of certification, specialised tools to support security certification, and, as an option, the SPARK language tool set to facilitate both development and certification of applications to top security levels.

**GNAT Pro High-Integrity Edition for MILS** contains the GNAT Pro development environment with compile system, testing tools, and graphical user interface components, to support high-productivity software development. It provides specialised run-time libraries, corresponding to Ada language subsets for those features that can be certified to different EALs. For EALs 1-3, the High-Integrity Edition for MILS provides a full Ada run-time library and development environment for the creation and testing required for these lower-level security certification requirements. For EAL 4, it provides a Ravenscar-compliant run-time library originally created to be certifiable to the DO-178B airborne avionics safety standard. This safety standard has been shown to meet the security assurance requirements for EAL 4. Finally, the Zero Foot Print (ZFP) run-time library is provided, which supports security certification to EALs 5 through 7.

Security certification at EALs 5-7 requires semi-formal or formal approaches. General software application languages are typically not appropriate at these levels. As an option, **GNAT Pro High-Integrity Edition for MILS** provides the SPARK Pro tool set to support these top levels. The SPARK language is a fully deterministic and verifiable subset of the Ada programming language augmented by pre- and post-condition constructs that more fully specify the application's logic and information flow. SPARK and the SPARK Pro tool set have been demonstrated in practice to meet the requirements for top security application development. The High-Integrity Edition for MILS thus provides a complete environment for applications that need to be certified at EALs 5-7.

"AdaCore has a long history in providing solutions for developers of high-integrity applications," said Robert Dewar, President and CEO of AdaCore. "GNAT Pro has been used for avionics systems on aircraft, such as the new Boeing 787, which need to meet the highest level of safety requirements in DO-178B. Developers of high-security applications require the more stringent security objectives be met. To satisfy this need, we have introduced the GNAT Pro High-Integrity Edition for MILS. This product, integrated with the SPARK Pro language and tool set, offers a unique security solution, allowing developers using a MILS architecture to create and certify applications that can meet all EALs from lowest to highest."

"Wind River VxWorks MILS platform provides a robust MILS architecture, enabling the creation of MLS (Multi-Level Secure) systems in which multiple applications from different domains execute securely on a single instance of silicon," said Chip Downing, Director of Aerospace and Defense at Wind River. "GNAT Pro High-Integrity Edition for MILS adds the capability to accelerate the certification of Ada applications at high assurance levels on the VxWorks MILS foundation for a very powerful combination for developing secure applications."

### DDS and Beyond: High Performance Networking for Complex, Distributed and Safety-Critical Systems

2nd June 2010; 9.30am—12.30pm; Technology Park Mawson Lakes; Adelaide

The DDS standard is constantly evolving to address end user requirements. An ever increasing array of complementary tools and networking technologies are emerging as a result of continued uptake and popularity of DDS. DDS is rapidly becoming the high-performance Enterprise Service Bus (ESB) for real-time Service-Oriented Architectures (SOA).

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for the full agenda and registration details.



## Rugged DO-160 certified Avionics BusBox

The Avionics BusBox 2000 (AB2000) series of products are small, lightweight, conduction cooled, embedded computers for rugged environments. These off-the-shelf computers have many built-in standard peripherals and interfaces for various avionics databases, as well as PMC expansion capability. With the addition of application software, the AB2000 provides a readily available Commercial Off-The-Shelf (COTS) solution to challenging interface, bridging and control problems. The AB2000 is available in many configurations to meet a variety of needs.

Typical applications for the AB2000 include data and protocol conversion, databus and network bridging, data servers, data recorders, communications, power controllers, federated controllers and multiple net-centric applications. The AB2000 delivers outstanding performance for applications on the ground and in the air. They are ideal for helicopter, fixed wing and ground mobile platforms.

At the heart of the AB2000 a user programmable PowerPC® processor runs the software application and controls the various standard (serial, Ethernet, USB, and discrete) and avionics databus (MIL-STD-1553, ARINC 429/708/717, etc.) interfaces. The high level of functionality implemented in the hardware interface circuitry assures full use of the PowerPC processor for the software application.



### BASE MODEL SPECIFICATION

- PowerPC processor
- 64 MB SDRAM
- 16 MB Flash
- Real Time Clock (with 650+ hours of backup)
- 2 RS-232/423/422/485 (selectable)
- 1 Ethernet (10/100) port
- 2 USB 2.0 host ports
- 16 Avionics Discrete I/O
- IRIG A/B AM/DC TTL receiver
- Voltage and temperature monitoring
- Flash drive (512 MB standard)
- Conduction cooled PMC site
- Power: 28 VDC nominal
- MTBF: 350,000+ hours

### AVAILABLE INTERFACES

- **MIL-STD-1553**  
Up to 4 dual redundant channels  
BC/RT/MON (Single or Multi-Function)
- **ARINC 429**  
Up to 12 channels (Rx/Tx)
- **ARINC 708**  
Up to 4 channels
- **ARINC 717**  
Up to 2 channels  
Biphase/Bipolar
- **Avionics Discrete I/O**  
Up to 48 programmable Input/Output

### APPLICATION EXAMPLES

The versatility of the AB2000 lends itself to many different applications. As a protocol converter, it can aid in the integration of commercial and military avionics. For example, acting as a MIL-STD-1553 Bus Monitor and an ARINC 429 transmitter, the AB2000 could make navigation data from a military system available to a commercial device. The Ethernet port may be used in a variety of applications including an Ethernet-to-avionics bridge, an avionics data server, or a remote control/monitoring interface for avionics devices. Aircraft data can be monitored and recorded to the on-board Flash storage. This is useful in maintenance applications where flight data can subsequently be analysed to detect potential problems.

### ENVIRONMENTAL

Extended Temperature  
Conduction or convection cooled  
DO-160, MIL-STD-810, MIL-STD-461

### MECHANICAL

Compact enclosure: 139mm x 186mm x 63 mm  
Weight: 1.6Kg  
Horizontal & vertical mounting



## Conduction cooled ATRs for CPCI and VPX

Elma's unique manufacturing methods enable them to provide a wide range of standard sizes that can be easily modified to meet project requirements. This rugged ATR platform for 3U VPX or cPCI boards features machined card guides that accommodate wedge locks to transfer heat from the boards to the platform walls within the machined slots. Special grade aluminium joined by a dip-braising process assures optimal conductivity for the pay load. This design also ensures that the ATR meets MIL-STD 810F for shock and vibration.

Elma's proven design techniques and COTS manufacturing approach meet MIL-STD 810, 461, 167, 901 and 704. The COTS ATR platform meets ARINC 404A, ARINC 600 and IEEE 1101.2 specifications and accepts 3U cPCI or VPX boards.

The MIL grade components qualify the ATR platform to meet harsh military and avionics applications which operate in harsh, high-altitude environments. The new lightweight ATR platform is ideal where a lower weight is crucial. It operates in a -40°C to +70°C operating temperature range for exceptional thermal performance.

The fully assembled and wired ATR platform is shipped with either a CompactPCI or VPX backplane, from 5 to 15 3U slots, and power supply designed to meet the application environment. Payload boards can also be supplied to meet a range of project requirements, from a Single Board Computer, to storage and Ethernet switches.

- Wide range of standard sizes can be easily modified to suit your requirements: - ½ to 1 ½ ATR long & short - 5 to 15 slots for 3U cPCI or VPX boards - Standard backplane; customs available
- Low weight, ideal for avionics applications
- High quality dip-braised, aluminium construction assures optimal conductivity
- Meets MIL-STD-810F for shock & vibration
- Payload boards can be integrated & tested
- COTS, convection cooled units available



### An Introduction to COTS & Embedded Systems

#### A 1 day training course about current and upcoming COTS architectures

Dedicated Systems Australia offers a 1 day training course for

- System integration and software engineers tasked with end-of life upgrades of deployed computer systems.
- System integration and software engineers tasked with designs of new deployed computer systems.
- Project Managers wanting a broad overview of prevailing industry trends in COTS technologies and platforms.

Participants will obtain:

1. An understanding of current and emerging COTS technologies and standards.
2. An appreciation of the drivers which lead to COTS solutions or in-house designs.

A detailed agenda is here: <http://www.dedicatedsystems.com.au/training/an-introduction-to-cots-embedded-systems/>