

## Application Feature



## Stackable Modules Enable High-Performance, Pilot Worn Tactical Display

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### Application Overview

The advanced Pilot Worn Tactical Display (PWTD) is a powerful video processing solution designed to provide a pilot with a single viewing source of flight-dynamic and ground symbology. The PWTD also provides for rapid target recognition and easy hand-off to sensors and weapons systems. The display monacle provides a color display with several-hundred stabilized points similar to that shown on a Tactical Situation Display.

### Customer Requirements

For this critical application the customer had a number of technical requirements, including:

- Processing bandwidth capable of performing overlays of real-time video from multiple sources
- Intel® Core™2 Duo processor with full driver support for the specified operating system
- PCI interface to support high-speed transfer of video and data packets
- SATA interface for connection to solid-state drives (SSDs) for program boot, data logging and configuration data
- LVDS video output
- Able to function on a noisy 28V aircraft power system
- Small and rugged
- Industry-standard expansion interface for connecting to an existing I/O module

In addition to the technical functionality, the customer provided business and environmental requirements including:

- Full industrial temperature operation: -40° to +85°C
- MIL-STD-202G shock and vibration compliance
- IPC-A-610 Class 3 construction for extended durability
- US-based ITAR-compliant manufacturer
- Extended product life, greater than 5 years
- RoHS compliant

### Solution

The VersaLogic application team provided a solution using stackable PCI-104 modules consisting of a VersaLogic Wildcat (VL-EPMp-34E) single board computer (SBC), a VL-EPM-PS1 power supply module, and a customer-supplied custom I/O module. All three modules connect through a rugged PCI stackable expansion bus and create an integrated stack measuring 107 mm x 96 mm x 50 mm high.

When power is applied, the system boots from a program image stored on an internal SSD. A second removable SSD is used to hold mission-specific information. The Intel Core 2 Duo CPU manages processing of the video and overlay data, which is transferred over the PCI bus. The video output is sent from the graphics controller on the Wildcat SBC to the pilot monacle via the on-board LVDS connector.

Clean conditioned and regulated power is supplied to the entire system solution using the VersaLogic in-stack power supply module that connects directly to the aircraft's 28V power bus.

VersaLogic application engineers supported the customer closely during the development and deployment process. Development time was reduced by the availability of off-the-shelf products for prototyping.

Key to achieving the customer's business and environmental goals with VersaLogic was the design and manufacturing of products in the U.S. Both the Wildcat and power supply modules are RoHS compliant and support extended temperature operation of -40° to +85°C. The VersaLogic policy of 100% environmental stress screening (ESS) and 100% functional testing of all products reduced the cost of customer failures in production as well as field mortality.

Compliance to the MIL-STD-202G specification for shock and vibration is standard for these products; however, the VersaLogic team made additional modifications to enhance vibration protection, such as installation of latching connectors, replacement of jumpers with zero-ohm resistors, and conformally coating key components.

## TOMCAT



- Very low power – 2.7 watts
- Fanless operation
- Fast Ethernet
- Extended temperature -40° to +85°C

## TIGER



- Intel Atom™ Z520PT processor
- 3D graphics
- Gigabit Ethernet
- Extended temperature -40° to +85°C

## WILDCAT



- Intel Core 2 Duo processor
- High-performance graphics
- Dual SATA
- Gigabit Ethernet
- Extended temperature -40° to +85°C

VersaLogic's performance range of rugged, small form factor single board computers for defense and aviation

VersaLogic's record of on-time production deliveries, Product Lifecycle Management, and its Product Longevity Guarantee benefited the customer by reducing inventory costs and ensuring future product availability.

### Wildcat (single board computer)

Designed to support embedded applications where high reliability and long-term availability are required, the IPC-A-610 Class 3-compliant Wildcat SBC provides high performance in a very compact size. Operating at up to 2.26 GHz, the second-generation Intel Core 2 Duo processor allows ample processing headroom to execute the applications' real-time video functions.

Intel's GS45 + ICH9M chipset offers graphics core speeds up to 533 MHz for high-end graphics and advanced 3D rendering, and the LVDS flat panel video interface support flexible display configurations.

Standard on-board features include gigabit Ethernet, an SO-DIMM socket for up to 4 GB DDR3 RAM, four USB 2.0 ports, one serial port, dual SATA interface, and support for HD audio. VersaLogic's SPX expansion interface creates additional access to cost-effective plug-in I/O solutions.

### VL-EPM-PS1 (in-stack power supply)

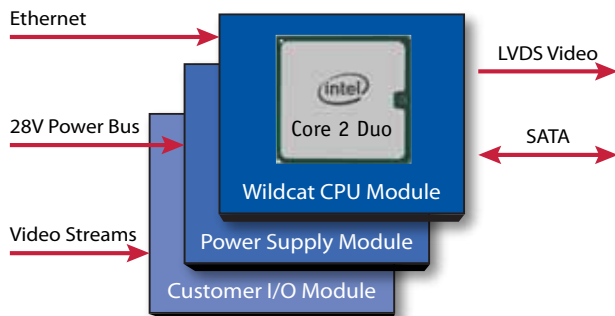
Even at +85°C this in-stack power supply module provides up to 25 watts of clean, regulated power. It operates over a wide +9 to +40 V<sub>DC</sub> input range and produces standard output voltages of +5V and ±12V delivered through the PCI connector to the SBC and I/O boards. Auxiliary terminal blocks provide output power for sensors and other ancillary circuitry.



### About VersaLogic Corporation

A leading supplier of industrial computers since 1976, VersaLogic focuses on high-quality board-level products for embedded OEM applications. Its 5+ year production life guarantee and outstanding warranties demonstrate a commitment to service. Product platforms include EBX, PC/104™, PC/104-Plus, PCI-104, EPIC, SUMIT™, and SPX™. For five consecutive years, VersaLogic has received the coveted *Platinum* level vendor rating based on independent user surveys by technology research firm VDC Research Group, Inc. VersaLogic is registered to the ISO 9001:2008 standard. For more information, visit [www.VersaLogic.com](http://www.VersaLogic.com).

VersaLogic VL-EPM-PS1  
Power Supply Module



System Interface Control Unit