

Cockpit Modernization with Ethernet

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DEFENSE SOLUTIONS



Challenge

- SWaP-constrained, cluttered platform with many legacy systems, difficult to maintain
- Complex mission system with high pilot workload
- Custom hardware with limited upgrade options

Solution

- High performance modular COTS processing system with integrated Ethernet
- Converged network efficiently shares data between systems and sensors
- Simple Ethernet cabling with high speed Gigabit performance

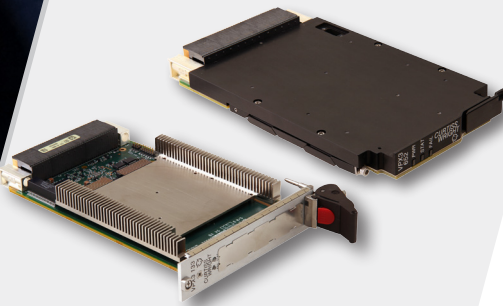
Results

- Greatly reduced system SWaP with room for future additions and upgrades
- Reduced pilot workload and improved situational awareness
- Greatly increased processing capacity enables new capabilities with software updates

Challenge

A customer contacted Curtiss-Wright with the need to upgrade a fleet of tactical aircraft. The aircraft incorporated a variety of sensors and computers for their combat mission, and throughout the years, the cockpits had become cluttered with several legacy systems. Each system was running its own processors and displays, adding weight and occupying limited space on the platform. The numerous links between systems each needed specialized cabling, and the constant crowding left no room for upgraded systems or modernized sensors.

In addition, pilots had to interpret information from a multitude of small displays in order to build a full picture of situational awareness. The complexity of this customer's mission system, and requirement for new hardware to interface with legacy hardware, made it a very difficult upgrade.



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VPX3-133 and VPX3-652

Solution

Curtiss-Wright worked closely with this customer to re-define their overall mission system hardware architecture. We provided a COTS processing solution based on high-performance SBCs and Ethernet networking, enabling high-performance links to sensors and radios. The result is a converged mission system that allows flexible movement of data and enables sensor fusion with software. Consolidating multiple systems reduced the number of single-function boxes, as well as the amount of cabling between boxes, freeing up much needed space. With our VPX3-652 Ethernet switch connecting all mission systems and sensors with Gigabit performance, the system now has capacity to carry high-definition imagery and low-latency sensor data. Our VPX3-133 and VPX3-1258 high-performance SBCs provided the processing capacity needed to replace numerous individual subsystems. With this configuration, our customer could now install a modern glass cockpit multi-function display that quickly combines information from multiple sensors and systems in one screen.

Results

Our customer's cockpit modernization improved pilot situational awareness while greatly reducing the workload required to execute their missions. The new system provides the capabilities of numerous legacy systems with significantly lower SWaP, providing the flexibility to add in new modules and sensors in the future as requirements evolve. Their new system is power efficient, easier to maintain, and more reliable, improving platform mission availability. New capabilities can be added via software that combines data from multiple sensors and systems and intelligently communicates the results to the crew. Not only that, the pilots now have no need to manually transfer data from one system to another, which reduces the rate of user data entry errors.

In addition, moving to a modular COTS architecture provided a highly cost-effective hardware platform with room for growth. The Curtiss-Wright product roadmap provides the option to upgrade individual modules as new technology becomes available, with drop-in replacement products that increase processing power and add new features.