CASE STUDY

Flexible, Secure Data-at-Rest Storage for ISR Applications

CURTISS-WRIGHT

DEFENSE SOLUTIONS

Challenge

- Removable storage
- Protection for critical data-at-rest
- High storage capacity
- SBC and storage interoperability

Solution

- 3U VPX FSM module
- FIPS 140-2 encryption
- 1 TB capacity
- Modified COTS product

Results

- High capacity 3U VPX secure data at rest storage
- Environmentally qualified storage
- Encrypted storage to protect ISR data
- Compatibility with SBC

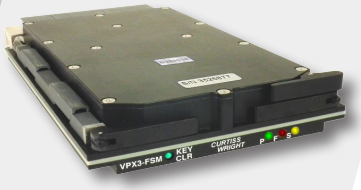
Challenge

An industry leader in the design, development and deployment of Intelligence, Surveillance and Reconnaissance (ISR) sensors required a removable storage device for their VPX system. The device needed to be 3U VPX form factor, high capacity and incorporate encryption to secure the data at rest. Interoperability between the single board computers (SBC) and the storage was desired in order to mitigate schedule risk associated with the system integration.

The ISR sensor would be deployed. This would require the storage device to be removable for transport to a secure site where the data would be offloaded. The removal of the storage device needed to be quick, easy and could not require special tools. In addition, the module had to be small enough in size that it could be transportable by hand.

Deploying the sensor required the data to be secured. The customer wanted advanced encryption such as FIPS 140-2 encryption. The storage device needed to support internally generated keys. This would ensure the sensitive data was protected at rest and could be transported to the field station for offload without the fear of losing the data.

The type of sensor being deployed would produce large amounts of data at a high data rate. In order to store the data a high capacity would be needed. The customer was looking for 1 TB of storage capacity per single board computer (SBC).



VPX3-FSM

During the integration process the customer determined that some minor modifications to the 3U VPX module would be needed in order to provide the complete storage system capabilities. The interoperability issues that appeared during the system integration threatened the overall schedule of the program. These issues needed to be addressed in order to deliver the system on time.

Solution

The ideal solution for this customer's project was Curtiss-Wright's Flash Storage Module (FSM). The FSM is VITA 48.2 compliant 3U VPX industry standard format. The FSM provides rugged, removable storage with the assurance of FIPS 140-2 validation. A direct-attached SATA storage device, the FSM, is designed for embedded computers met the demands of this program. The 3U VPX form factor enabled the customer to meet their SWaP-constrained system requirements.

The FSM has been validated by NIST for FIPS 140-2 Level 2 encryption (certificate #1885). The AES256-bit encryption used on the FSM can be seeded by keys that are either internally generated via a FIPS-compliant random number generator (RNG), or externally supplied by the user. This flexibility allows system designers to respond to changing program security requirements. With the unique feature of FIPS 140-2 validated encryption, the FSM protects sensitive data in deployed systems.

The high-throughput of the sensor made it necessary to have a high capacity storage device. The FSM offered 1 TB of storage capacity which was required to gather all of the sensor data that was being generated. With Direct attached SATA connection a 1 TB FSM could be dedicated to a single SBC.

In order to mitigate schedule risk a slight modification to the FSM was made to support interoperability with the SBC. The FSMs design was flexible enough that the modification was able to be made without significant hardware or software changes. This saved significant integration time.

Results

The rugged, 3U VPX, 1 TB, FIPS140-2 validated direct attached storage module met both the customers capacity and encryption requirements while mitigating program associated with system integration. The COTS storage module was tested by Curtiss-Wright for interoperability with the SBC it received data from, ensuring easy integration and faster time to market for the customer. The 1 TB capacity of the module and FIPS 140-2 encryption enabled the customer to securely capture the large volume of sensitive data produced by the ISR sensor. The module is equipped with tool-less wedge locks enabling the removal of the storage module so that it can be transported to a ground station for analysis.

Images courtesy of Defenselmagery.mil

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