

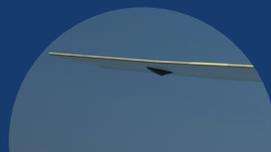
At a Glance

- Physical mitigation devices
- Simplifies cyber assessment and authorizations, saving time and money
- Ruggedized, flight ready designs
- Compatible with commercial-off-the-shelf ethernet tools
- Protects avionics bus from: malicious traffic, LRU failure, signal transients, untrusted bus monitors, etc.

Use Cases

Utilizing Vegas and/or Vampire during test, maintenance, system upgrades, or other MIL-STD-1553 data bus operations, users can be confident their data bus is protected. Compatible with many COTS MIL-STD-1553 analysis tools, users are provided the flexibility to process and analyze data based on their platform's needs.

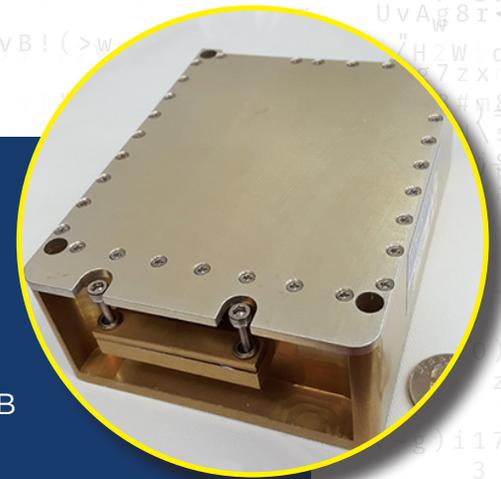
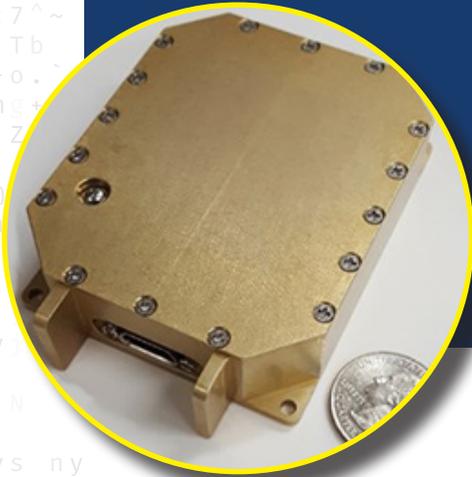
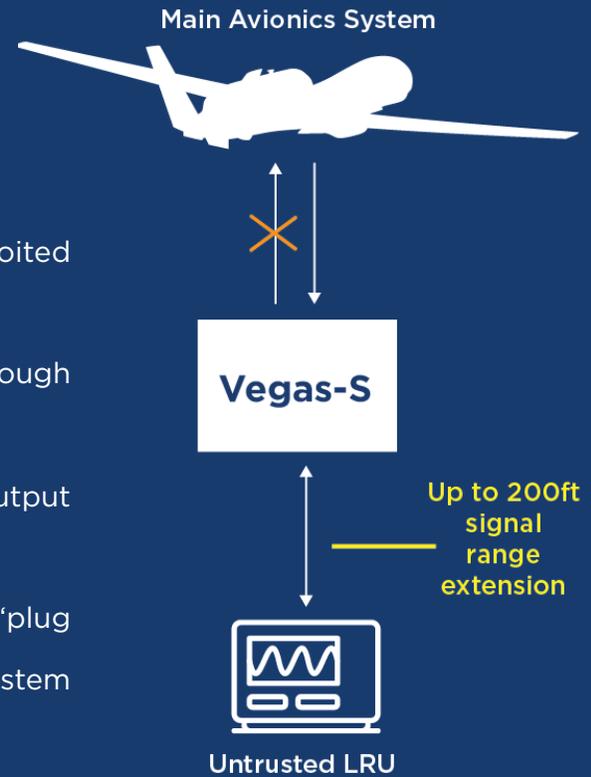
- For novice users who want to have a visual representation of MIL-STD-1553 bus traffic. Vampire implementation allows for capture of MIL-STD-1553 bus traffic which is then demodulated and sent via UDP packets, over Ethernet in real time.
- For advanced users interested in more complex data analysis and anomaly detection. Vampire allows users to detect bus anomalies via bus response time analysis, or an in depth post-operation data analysis via SD card data capture.
- For those performing test/maintenance where desired equipment is not authorized for use. Vegas protects the MIL-STD-1553 bus, allowing for reduced or eliminated equipment authorization timelines.



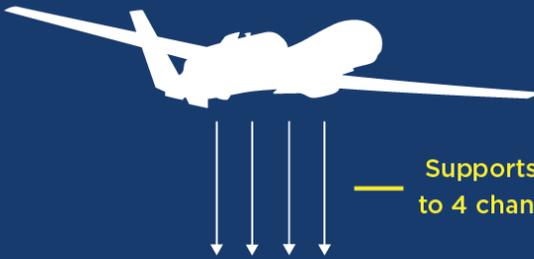
Vegas-S

Data Diode

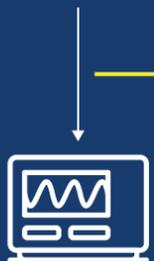
- One directional data flow, acts as a physical firewall
- No loadable firmware or software — cannot be exploited by cyber attacks
- Repeater — extends cable length limits through reconditioned MIL-STD-1553 signals
- Extremely low input to output latency
- Simplified integration — “plug and play” module eases system integration



Main Avionics System



Vampire



Future LRU
Bus Characterizer
Anomaly Detector

Vampire

Data Recording

- Log up to 10 hours (256 GB SD card required)
- Read only bus monitor — protects bus from untrusted devices
- MIL-STD-1553 to ethernet — receives MIL-STD-1553 bus data and sends demodulated packets over ethernet via UDP
- UDP — open standard offers users flexibility, uses less bandwidth, operates over ethernet in real-time

Technology developed by Air Force Research Laboratory (AFRL), U.S. Patent 10,432,730 and U.S. Patent 10,296,477 | Device information released via PA Case Numbers 88ABW-2020-1622 and 88ABW-2020-1828.



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