

DATA NETWORKING

Flexible Communication Systems Development

The Space Dynamics Laboratory's (SDL) data networking team provides cost-effective data network systems and development services to Government and military agencies. Our network expertise ranges from low- to high-speed communication solutions, including technologies supporting over 1 Tbps data rates. SDL implements multiple platforms that support airborne and ground-based data communications.

In addition to network interfaces, SDL's systems typically include embedded processing capability for data analysis. Our platforms leverage COTS components when possible and are readily adaptable to meet customer needs. A typical architecture implements a Linux OS running on a multi-core CPU coupled to one or more field-programmable gate arrays (FPGAs) via PCIe. SDL's networking devices exemplify years of experience in digital design, high-speed networking, and hybrid embedded Linux/FPGA/PCIe architectures.

FEATURES

Flexibility

- Functionally adaptable for custom applications
- Physically adaptable to mission & environmental constraints
- Support for multiple network protocols
- Ground-to-air; ground-to-ground; air-to-air

Capability

- Platforms supporting data rates from 8 Kbps to over 1 Tbps
- Network analysis
- Cyber-resilient designs compliant with latest security requirements

Heritage

- Over 65 years of digital designs & hardware development
- Experts in embedded Linux/FPGA/PCIe architectures
- Hundreds of systems fabricated, tested & delivered

SDL couples data networking expertise with an excellent record of on-time, on-budget program execution. As a nonprofit University Affiliated Research Center (UARC), SDL provides data with unlimited use rights to Government customers and is flexible in our contracting options. SDL's quality management system is certified to the AS9100D standard, which is indicative of our commitment to high-quality engineering practices.

AIRBORNE SENSOR RECEIVER, RECORDER & SIMULATOR

SDL's family of airborne sensor receivers receive, record, and simulate various airborne reconnaissance sensors, including common data link (CDL) and asynchronous transfer mode (ATM) platforms such as Global Hawk and U2. Our systems translate these sensor protocols to Gb Ethernet for ground station consumption, supporting up to 15 TB of memory for up to 30 days of mission storage and playback. Airborne sensor receivers are built on a powerful and flexible Linux-based server, offering dual Intel CPUs in a 1U rack-mount configuration. Their PCIe sensor interface cards can be configured as needed to support multiple sensor types. Custom PCIe expansion cards can be implemented for full mission support.



FEATURES

- Dual 2.6 GHz multi-core CPUs
- 1U rack-mount configuration
- CDL & ATM PCIe I/O boards
- Up to 15 TB storage capacity
- Sensor data record & playback
- Expansion using PCIe add-in cards
- Flexible system with various expansion options

Sensors Supported

- ATARS (CDL)
- Global Hawk (CDL)
- ASARS (ATM)
- SYERS (ATM)

NETWORK APPLIANCES

SDL develops custom network appliances using advanced technologies to analyze, manage, and protect critical communication and infrastructure. These appliances are capable of operating in real time to identify multi-layered, multi-dimensional threats and anomalies. Technologies employed in these appliances may include, but are not limited to, FPGAs, CAMs, DPUs, NPUs, IPU, ASICs, P4, DPDK, ML, AI, hardware accelerators, custom software stacks, and multi-core processors.

SDL's network appliances support a broad spectrum of network technologies and protocols, and they support data rates ranging from 8 Kbps to beyond 1 Tbps. Some appliances are developed with COTS hardware, while others contain a combination of SDL-developed and COTS hardware. SDL develops the firmware and software to configure and control the appliances via CLI and/or GUI. Software development kits (SDKs) are provided to enable custom application development.



Questions? SDL welcomes all inquiries. For more information about data networking services, please contact:

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