

CGI SignalSense

For U.S. Federal



CGI SignalSense is a multi-domain signals and geospatial data fusion platform

Federal agencies, including intelligence, military and law enforcement operations, require clear signals communications to operate. Surveillance and intelligence rely on communications, while Precision, Navigation and Timing (PNT) signals from satellites enable precise operations for mission-critical facilities.

Foreign adversaries and criminal enterprises continue to deploy sophisticated technology to disrupt or jam these signals, threatening national security and various kinds of enforcement activities. The key to security is having the tools to quickly identify disruptions.

CGI SignalSense provides a powerful defense against these attacks, analyzing and interpreting signals in near real time to detect interference and jamming attempts, and to locate their source.

SignalSense works with a large variety of signals capabilities such as sensor networks, commercial ISRs, linked to artificial intelligence/machine learning tools to capture, predict, identify and categorize data. It produces pattern-of-life analyses and data visualizations to make it easier for analysts to separate meaningful signals from noise.



Federal use cases

While signals intelligence and communications are critical in many contexts, below are a few use cases where CGI SignalSense is ideally suited:

Infrastructure protection: The public services that comprise the critical infrastructure, including power grids, financial systems, hospitals and transportation networks, rely on PNT via the Global Navigation Satellite System (GNSS). They would be at risk of cascading failures if an adversary were to disrupt PNT signals for a long enough period of time—which could be just a few seconds. SignalSense can detect and geolocate PNT jamming attempts, even those that emanate from high altitude or space.

Maritime and border security: Drawing on a fusion of space-based sensors, SignalSense provides wide-area Intelligence Surveillance and Reconnaissance (ISR) in both the signal and geospatial domains to detect jamming or spoofing. This prevents criminals from concealing their activities at sea or along the border. For example, SignalSense could detect, alert and investigate “dark ships” who have turned off or disabled their Automatic Identification Systems (AIS) to hide illegal bunkering (ship-to-ship transfers) for illegal commodity transfers.

Law enforcement: Police and other law enforcement organizations, including federal agencies such as the FBI, need the ability to quickly detect and locate criminals over wide areas in cities and rural areas, who might use jamming equipment to hide. Some car theft rings, for example, have used relay theft and signal jamming to escape detection. The SignalSense platform can process multiple sensors from law enforcement drones, vehicles and backpacks to penetrate those defenses and help authorities locate domestic or transnational criminal enterprises.

Enforcing immigration and customs laws: SignalSense can be useful in the fight against illegal border crossings, drug smuggling and human trafficking by identifying and geolocating signals over wide areas of surveillance. The platform can utilize data from Android mobile phones and from drone-mounted or backpack-mounted devices to covertly identify unusual spectrum-emitting locations or Global Positioning System (GPS) jamming that criminals could use to prevent surveillance.

SignalSense provides:

- Spectral and geospatial intelligence interfaces to rapidly deliver sensor insights and inform mission data reprogramming.
- Anomaly detection and integrated third-party algorithms to analyze disparate inputs.
- A highly configurable and easy to use data integration suite to rapidly incorporate common geospatial data formats.
- Highly scalable and resilient cloud native architecture capable to be deployed to the cloud or to low size weight and power (SWaP) platforms, enabling processing of streaming or static data sets.
- Connectors to common commercial space-based signal capabilities to inform analysis.
- Electromagnetic spectrum (EMS) analysis and geolocation of signals over a wide spectrum, which the system can analyze with low latency.

SignalSense can work with your own data, or with data provided via API from third party providers in Receiver Independent Exchange Format (RINEX). CGI can also offer testing services so that you can understand the performance of your operations in the face of GNSS interference.

Scalable and cloud-ready

CGI SignalSense is built on a containerized platform able to process terabytes of signals data daily. This architecture enables the system to scale or contract depending on the number of spectrum monitoring locations that you deploy. CGI SignalSense can be deployed on premise or to the cloud and scaled according to the organization's needs.

The solution is also completely mobile if agencies need it to be. It can be deployed to localization equipment such as backpacks, vehicles or drones. There is even a mobile app that can leverage a phone's internal sensors, giving your operators a quick and easy way to detect presence of interference.



About CGI

CGI Federal Inc. (CGI), a wholly owned U.S. operating subsidiary of CGI Inc., is a leading technology and professional services company that serves federal agencies across defense, civilian, healthcare, justice, intelligence and international affairs. With nearly 8,000 professionals, we work with our clients to modernize government through innovative technology solutions, flexible delivery models and a commitment to achieve mission outcomes. For more information, visit www.cgifederal.com