

Digital Radio Frequency Memory (DRFM) & Axellio SensorXpress

What is Digital Radio Frequency Memory (DRFM)?

Digital Radio Frequency Memory (DRFM) is an advanced electronic warfare (EW) technology that captures incoming Radio Frequency (RF) signals, digitizes them, stores them briefly, and retransmits them with modifications. It enables radar deception, jamming, and electronic counter-countermeasure (ECCM) testing by manipulating signals with nanosecond precision.

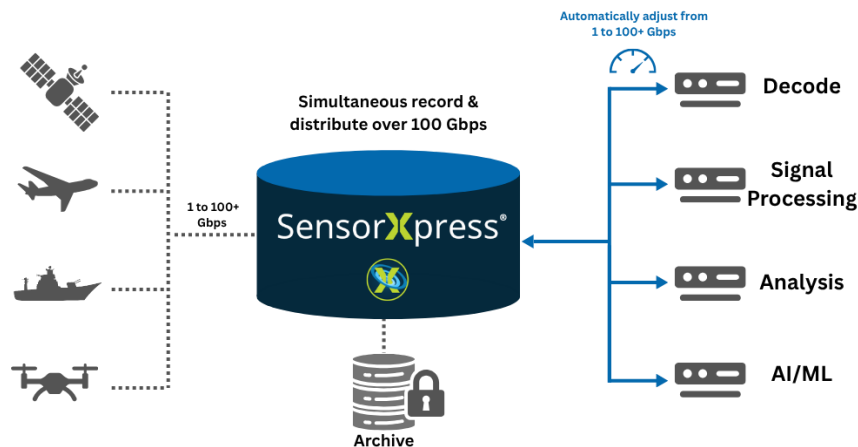
Common DRFM applications include:

- **Self-protection jamming systems** for aircraft, ships, and ground vehicles
- **Radar test and simulation environments** (hardware-in-the-loop)
- **Miniaturized expendables** for last-minute missile defense to protect ships and aircraft
- **Countermeasure systems** for spoofing surveillance and tracking radars

As threats grow more agile and radars more advanced, DRFM systems must operate with higher bandwidths, lower latency, and smarter signal processing capabilities.

How Axellio SensorXpress Can Support DRFM

SensorXpress® enhances DRFM operations by acting as the high-performance data backbone for RF capture, analysis, and replay. It addresses modern EW demands by combining extreme performance with tactical flexibility.



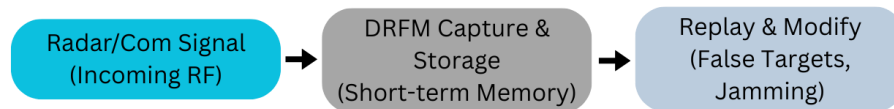
- **High-Speed RF Data Capture & Replay:** SensorXpress can ingest, timestamp, and store multi-gigahertz RF signals with lossless performance, enabling accurate capture and replay for EW missions.
- **Integration with DRFM Payloads:** Acts as the bulk storage and retrieval system for deception libraries, supporting quick loadout of DRFM deception profiles.
- **Multi-Sensor Fusion:** Synchronizes and correlates RF, cyber, radar, EO/IR, and comms data for integrated EW operations and test environments.

- **Analytics and AI/ML Integration:** Provides the data backbone for AI/ML-driven optimization of DRFM deception and adaptive EW strategies.
- **Edge Deployability:** Ruggedized, compact SensorXpress nodes support forward-deployed DRFM and EW missions while linking to rear-echelon analysis centers.

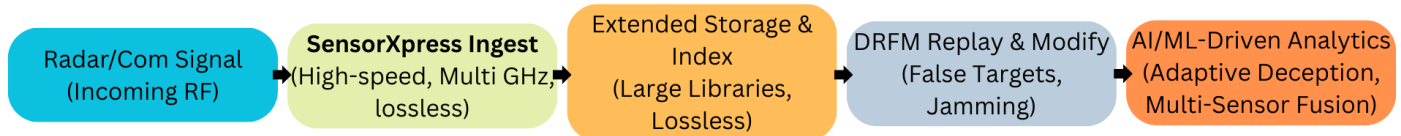
Its SWaP-optimized architecture allows it to be deployed in airborne, naval, or ground platforms, bringing real-time replay and analysis to the tactical edge. Meanwhile, its networked design allows for centralized analysis and long-term data warehousing at command centers.

Schematic: DRFM Before and After Adding SensorXpress

Before SensorXpress



After Adding SensorXpress



SensorXpress Advantages

- High-speed RF ingest (multi-GHz, lossless)
- Long-duration storage & retrieval of deception libraries
- Time synchronization across multiple sensors
- Enables AI/ML-driven adaptive DRFM
- Ruggedized, edge deployable platform

Conclusion

SensorXpress enhances DRFM effectiveness by enabling high-speed capture, storage, replay, and analytics of RF and multi-sensor data. It strengthens both operational EW missions and the test & evaluation ecosystem, positioning Axellio as a critical enabler for next-generation electronic warfare.

About Us



Axellio mission is to control data overload in timeseries analysis systems that monitor for threats to our infrastructure through innovative storage and distribution solutions. Axellio innovative software solutions simultaneously capture, store, analyze, and distribute any streaming data exceeding 100 Gbps in a scalable but extremely small footprint.

www.Axellio.com