

BC Automation

RadioDecay SPA™ – Energy-Symbolic Signal Architecture

Tech Primer - 07/09/25

Physics becomes protocol. No wires, no RF — just secure decay-traceable data. RadioDecay SPA™ is a specialized variant of the SPA™ framework that uses the physics of radioactive decay to encode symbolic telemetry. There are no signals to jam, no emissions to intercept, and no power draw needed for transmission.

By embedding timestamped, tamper-evident control states into the decay pattern of low-energy sources, RadioDecay SPA™ offers a new kind of signal layer: entropic, stealth-grade, and unspoofable.

It is designed for use in air-gapped, power-constrained, or mission-critical environments where traditional communication cannot operate or be trusted.

PROBLEM: Not all environments allow signals to exist.

- Spacecraft, nuclear, or shielded systems can't emit RF
- Telemetry needs to persist even when power fails
- TrustLabel™ requires ground-truth records, not just cloud logs
- Traditional networks introduce traceability and latency gaps
- Vulnerable legacy backhails are avoided by design

SOLUTION: Let nature signal for you.

- RadioDecay SPA™ embeds control state into the unique entropy of a decay curve
- Signals are initialized by pairing radioactive material with a passive detector node
- Timestamped SPA metadata is encoded without the need for active emission
- Readouts are verified via decay chain observation and drift pattern analysis

OUR IMPACT: Verification, even when silent.

RadioDecay SPA™ operates without emissions or infrastructure, and when paired with a modular RTG (radioisotope thermoelectric generator), it becomes a self-contained, symbolic telemetry node:

- No external power required
- No wired or wireless signal paths
- No maintenance over multi-decade life spans

It enables telemetry and trust in the harshest, most restricted environments.

Applications include:

- Deep space probes
- Subsurface or containment environments
- Cold chain pharma and black-box logistics
- Strategic or sacred infrastructure

Together with Quantum SPA™ and Quantum IO™, RadioDecay SPA™ forms part of BC's symbolic edge tier, designed to operate when signals are restricted and power is scarce. RadioDecay SPA™ already exists today, forming a silent, persistent layer of symbolic telemetry beneath traditional systems.



95+

clients served

625+

unique processes automated

\$3.8B+

client dollars saved

"A huge asset to any company looking to improve their cost and reliability."

Chris Whitehair
SVP Global Operations at SunOpta

"[BC Automation's] solutions are most thorough and comprehensive."

Ned Mitenius
Founder & Sr Consultant at Periscope Consulting

Let's Transform Your Manufacturing Together.



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