ALEC Codec for Satellite IoT

Maximize Payload Efficiency • Minimize Transmission Costs

The Satellite IoT Challenge

Satellite connectivity enables truly global IoT coverage, but comes with unique constraints: **every byte transmitted costs money, drains power, and consumes precious spectrum.**

Cost per Byte	Payload Limits	Power Budget
$0.001 - $0.01 per byte	12-100 bytes typical	TX = 80-90% of total

Traditional compression (gzip) makes small payloads BIGGER. ALEC makes them smaller.

Why ALEC for Satellite IoT

Feature	Satellite Benefit
80-95% Compression	Fit 5-10x more data in same payload. 100-byte message → 10-20 bytes.
Small Message Optimized	Designed for 12-100 byte payloads. No overhead bloat like gzip/zstd.
Delta Encoding	Only transmit changes. Stable sensors = minimal satellite time.
2KB Footprint	Runs on terminal MCUs (Cortex-M0+). No cloud dependency for encoding.
Priority System	P1 (critical) always transmitted. P5 (routine) batched when bandwidth available.

Expected Impact

Transmission Costs	Battery Life	Data per Pass
-70 to -90%	**3-5x longer**	**5-10x more**

Satellite IoT Use Cases

Agriculture	Maritime	Oil & Gas	Environment
Remote soil, weather sensors	Container tracking, fleet monitoring	Pipeline, well monitoring	Wildlife, climate sensors

Network Compatibility

ALEC Codec integrates with major satellite IoT networks and protocols:

- **LEO Constellations:** Kinéis, Iridium SBD, ORBCOMM, Myriota, Astrocast
- **GEO Networks:** Inmarsat ELERA, Thuraya M2M, IsatData Pro
- **Hybrid LoRaWAN/Satellite:** Lacuna Space, Wyld Networks, EchoStar Mobile

Let's Explore a Partnership

David Martin • hello@alec-codec.com • alec-codec.com
Switzerland • SDK available for evaluation