NEXT-GENERATION EMERGENCY LOCATOR TRANSMITTERS

KEY SECOND-GENERATION ELT ADVANTAGES

SUPERIOR NETWORK ARCHITECTURE AND COVERAGE

SHARPENED ACCURACY AND LOCATION PERFORMANCE

ENHANCED DISTRESS MESSAGE CONTENT

FUTURE-PROOF

HIGHER RESILIENCE AND REDUNDANCY

IMPROVED SEARCH AND RESCUE OPTIMIZATION

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SUPERIOR NETWORK ARCHITECTURE AND COVERAGE

First-Generation ELT

Second-Generation ELT

GNSS   GLONASS

Limited coverage

Message latency up to 1 hour

Near-instant global coverage

Message latency under 10 seconds

First-Generation (LEOSAR/GEOSAR):

- Utilizes Low Earth Orbit (LEOSAR) and Geostationary (GEOSAR) satellites.

- Limited coverage over polar regions and subject to orbital blind spots and delays.

- Message latency can take up to **an hour**.

- Limited real-time tracking.

Second-Generation (MEOSAR):

- Utilizes Medium Earth Orbit Search and Rescue (MEOSAR) satellites integrated with GNSS constellations (GPS, Galileo, GLONASS).

- Near-instant global coverage, including the poles and oceans.

- Message latency typically under 10 seconds.

- Continuous coverage with high-speed message relay.

Advantage: *The Second-Generation's MEOSAR network enables global, near-instantaneous distress signal reception, even in the most remote locations, which significantly shortens response time and improves survivability.*

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SHARPENED ACCURACY AND LOCATION PERFORMANCE

2nd Generation Accuracy: ~10 meters

1st Generation Accuracy: ~1km+

First-Generation:

- If GNSS is included (not standard), the latitude / longitude is quantized — typically to 4-or-5-bit resolution, limiting positional precision to 1 km or more.

- Fixed 15-hex-character ID with minimal flexibility for future expansion or richer data.

- Antiquated encoding scheme provides coarse location, does not include altitude, velocity, error correction, or redundancy making it more susceptible to loss or corruption.

Second-Generation:

- 12–to-15 bits or more of resolution per coordinate affords far superior location accuracy of ~10 meters.

- Includes velocity, altitude, and timestamp, improving SAR coordination.

- Supports repeating, rotating, or multi-burst encoding for better decoding chances with redundant and error-corrected location data.

- Uses a modern TDMA burst structure that works with MEOSAR satellites in real time.

- **Faster and more accurate location of survivors after a crash.**

Advantage: *Second-Generation technology pinpoints the crash site within seconds which facilitates faster SAR deployment, directly improving survival outcomes and reducing search costs.*

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ENHANCED DISTRESS MESSAGE CONTENT

First-Generation

HELP

Second-Generation

HELP

First-Generation:

- Limited to 112 bits of data - Broadcasts basic beacon ID and (optionally) GNSS coordinates.

- Does not include essential location data (e.g., altitude, velocity, accuracy) that severely impacts search and rescue response times.

- One-way transmission; no return link or system verification.

- No error correction or message interleaving – if a satellite misses it then it must wait for the next satellite to pass.

Second-Generation:

- Up to 252 bits of data - Supports richer message protocols (RLS-enabled): aircraft ID, GNSS location, status, optional flight tracking breadcrumbs.

- Return Link Service (RLS) provides beacon acknowledgment—users know the alert was received.

- Developed specifically for the ICAO GADSS (Global Aeronautical Distress and Safety System) mandates with high-fidelity, real-time tracking.

Advantage: *Second-Generation technology offers two-way communication capability, allows aircraft to verify signal receipt, and provides SAR teams with far more contextual data to aid with their rescue.*

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FUTURE-PROOF

First-Generation
Phasing out

FUTURE READY ✓ ✓

Second-Generation

First-Generation:

- Developed in the 1970s to meet basic 1-way ELT requirements of a transmission *after* a crash occurs.

- Older error-prone transmission is akin to a fax machine's modulation scheme.

- Becoming increasingly obsolete due to its antiquated timing and structure which makes it highly susceptible to data collisions – a real concern in today's real-time distress tracking world.

Second-Generation:

- Developed in the last decade with Full Operational Capability (FOC) in 2024, designed specifically to meet ICAO GADSS Distress Tracking requirements.

- Designed to be reliable and secure with Time-Slotted transmissions akin to modern cell phones.

- Supports 2-way communication via Return Link Service (RLS), a critical part of the industry's next generation ELTs.

Advantage: *Second-Generation technology was developed to specifically overcome the issues with the First-Generation network, providing secure, reliable, and instantaneous links that support the ELT industry's technology roadmap.*

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HIGHER RESILIENCE
AND REDUNDANCY

First-Generation

Second-Generation

First-Generation:

- Vulnerable to delayed alerts and missed signals due to satellite geometry.

- Search and Rescue (SAR) alerting dependent on ground stations with slower confirmation.

- The network's satellites have narrowband receivers which limit them to decoding only 1 transmission at a time.
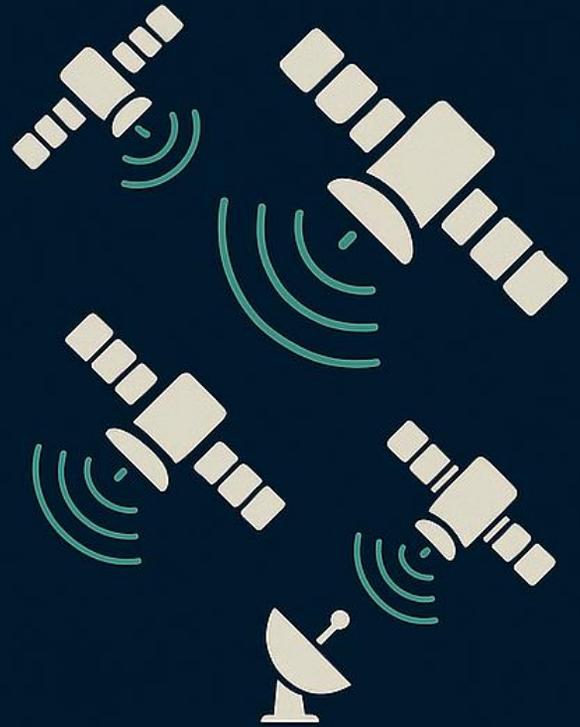
Second-Generation:

- MEOSAR network provides multi-satellite detection with overlapping coverage, reducing single-point failures.

- Alert messages received by multiple satellites simultaneously and routed via redundant ground stations.

- Supports many simultaneous transmissions by using internal GNSS to synchronize transmissions.

Advantage: *Second-Generation technology provides superior resilience and ensures that no distress alert is lost – even during satellite or station outages or during multiple simultaneous transmissions – a reality in the age of distress tracking. Operators gain peace of mind with layered redundancy.*

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SEARCH AND RESCUE OPTIMIZATION

First-Generation

Second-Generation

First-Generation:

- Search and Rescue (SAR) crews must often conduct wide-area sweeps due to poor location data and delays.

- Higher cost and lower efficiency in SAR operations.

- *Reduces* the perceived commitment to safety of operators that continue to utilize antiquated first-generation technology.
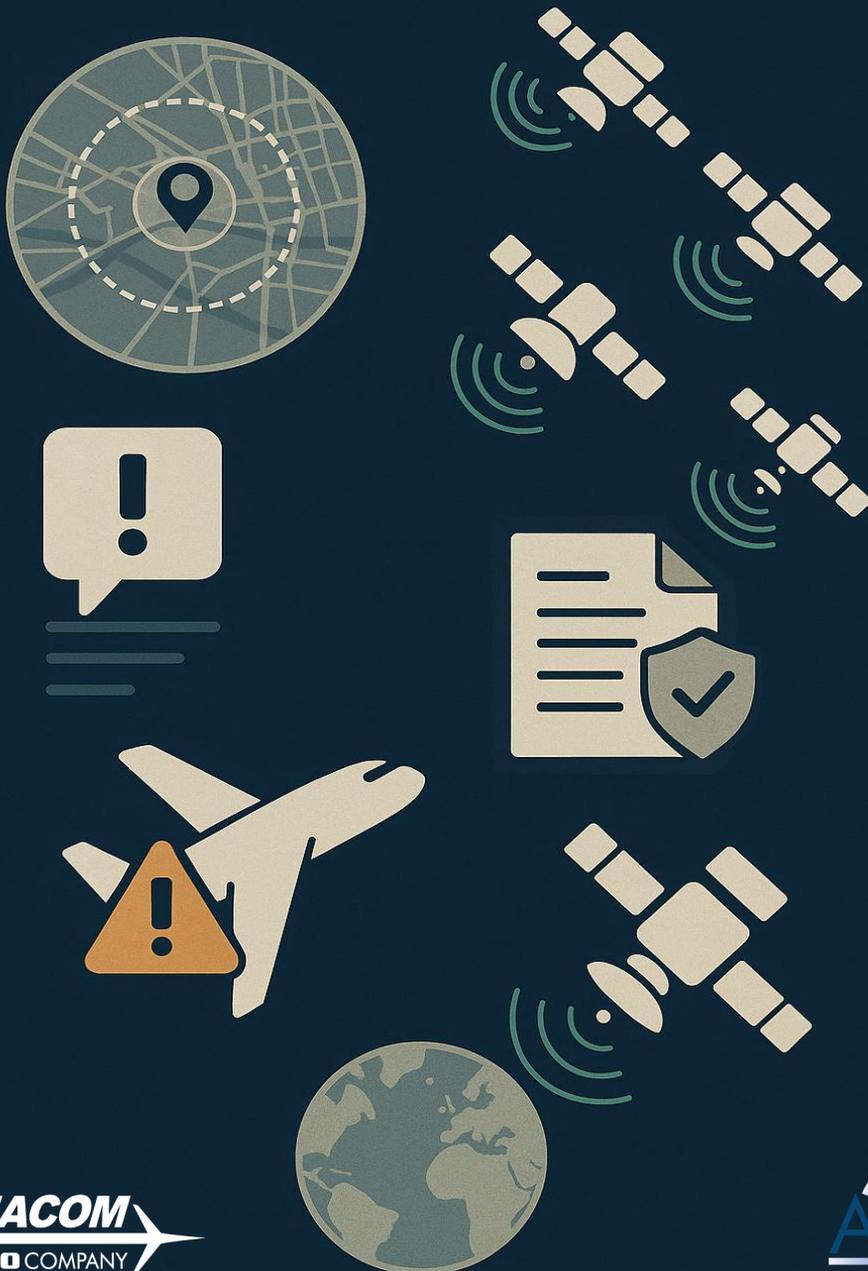
Second-Generation:

- High-precision GNSS location narrows SAR zone to a few hundred meters.

- Live tracking breadcrumbs with precise location details in the message help reconstruct final flight paths.

- Operators selecting Second-Generation technology are demonstrating their commitment to passenger safety.

Advantage: *Second-Generation technology allows SAR operations to become surgical instead of sweeping – reducing time, fuel, risk, and cost while dramatically increasing rescue rates and demonstrating a commitment to safety.*

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2ND GENERATION ELTS: SAFE, RELIABLE, & FUTURE PROOF

The 2nd Generation ELT network is not merely a technology refresh – it is a fundamental transformation in the way aviation safety is ensured. From real-time alerting and pinpoint accuracy to global redundancy and future mandate compatibility, second-generation ELTs eliminate critical vulnerabilities that have long plagued older systems.

For operators, regulators, and aircraft OEMs alike, adopting second-generation ELT solutions is a smart investment in safety, compliance, and operational readiness. As the global aviation landscape evolves—with extended operations, increased automation, and greater expectations for traceability—the MEOSAR-based 2nd Generation ELT system delivers unmatched advantages no airline or operator can afford to overlook.

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PROVEN MEMS TECHNOLOGY: ENHANCING SAFETY AND ELIMINATING NUSIANCES

GOODBYE FALSE ACTIVATIONS

PRECISE, MULTI-AXIS DETECTION

PROVEN IN-SERVICE RELIABILITY

Dukane's 2nd Generation ELT with Distress Tracking leverages field-proven MEMS (Micro-Electronic Mechanical System) technology to detect crashes in lieu of a traditional g-switch crash sensor. This technology provides a solution that is more durable in a harsh aerospace environment and eliminates nuisance activations.

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CONFIGURATION, EVENT, AND FAULT LOGGING

Dukane's 2nd Generation ELT with Distress Tracking is complemented by an easy-to-use user interface via the ELT's Maintenance Port. A Microsoft Windows-based application provides a direct link to the ELT via a USB port.
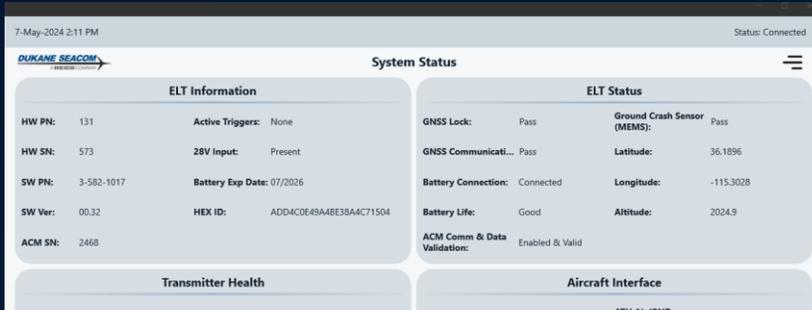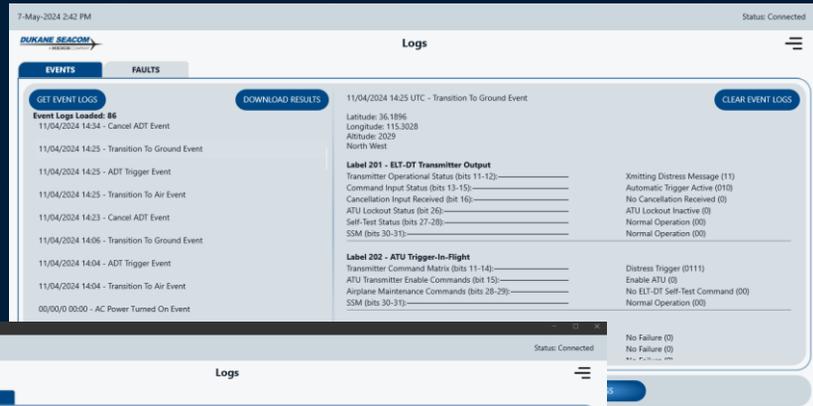

Quickly access the system status and configuration options.
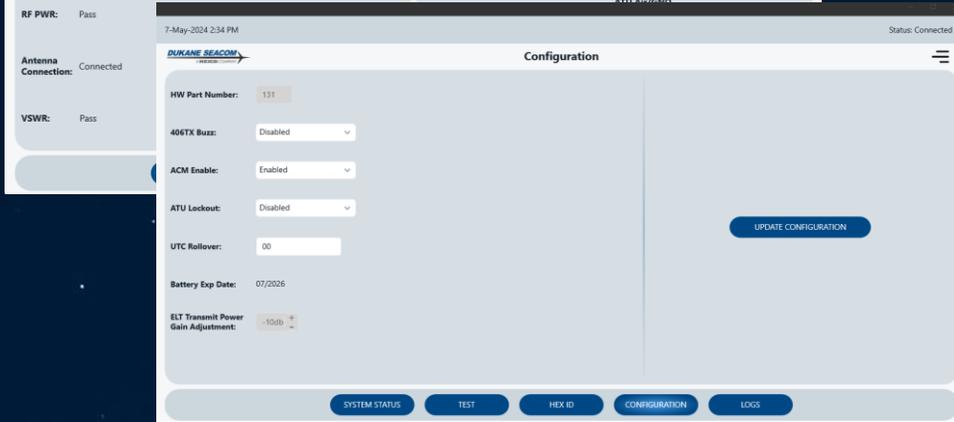
Initiate Self-Tests, Yearly Tests, etc. and view results immediately.

Quickly view EVENTS with timestamps for ELT transmissions, power changes, configuration updates, air-to-ground transitions, etc.

System FAULTS are logged with timestamps for GNSS faults, antenna faults, battery life fault, etc.

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THE WORLD'S FIRST AND ONLY CERTIFIED SECOND-GENERATION ELT WITH DISTRESS TRACKING
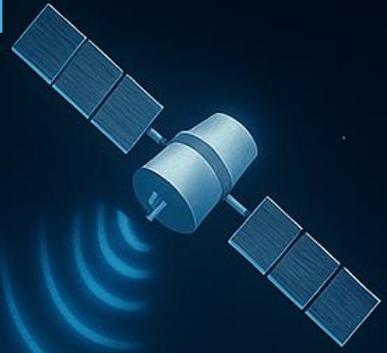
Dukane Seacom's new DK-406-DT is a state-of-the-art, crash survivable distress tracking ELT solution that was designed and tested to meet current and future requirements for ELTs worldwide including the GADSS requirement for in-flight distress tracking and automatic inflight triggering.

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DUKANE'S 2ND GENERATION ELT-DT KEY FEATURES

- World's first and only 2nd Generation ELT with Distress Tracking

- Ultra-reliable and field-proven MEMS crash sensor with configurable trigger axis

- Meets GADSS requirements for automatic in-flight triggering

- Meets DO-227A thermal runaway containment requirements with NO venting

- Meets Class 1 ELT requirements

- Robust aluminum housing with military-grade connectors

- Self-contained GNSS receiver

- 121.5 MHz homing transmission

- ✓ TSO-C126c Certified
- ✓ TSO-C142b Certified
- ✓ Class-1 ELT Certified
- ✓ 5-year Battery Life
- ✓ Integrated GNSS

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MARKET ACCEPTANCE

COSPAS/SARSAT has installed and upgraded ground stations worldwide to receive 2nd Generation distress signals.

The global infrastructure significantly improves the speed, accuracy, and reliability of Search and Rescue (SAR) operations.

Dukane Seacom's 2nd Generation Distress Tracking ELTs (ELT-DTs) have been exclusively selected by leading business aircraft manufacturers, including Gulfstream and Bombardier. Hundreds of ELT-DT units have been delivered, demonstrating strong confidence in our solution and widespread industry acceptance.

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Visit our website at www.DukaneSeacom.com or visit www.GADSS2.com to learn more about 2nd Generation ELT technology and other benefits of our Distress Tracking ELT.

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