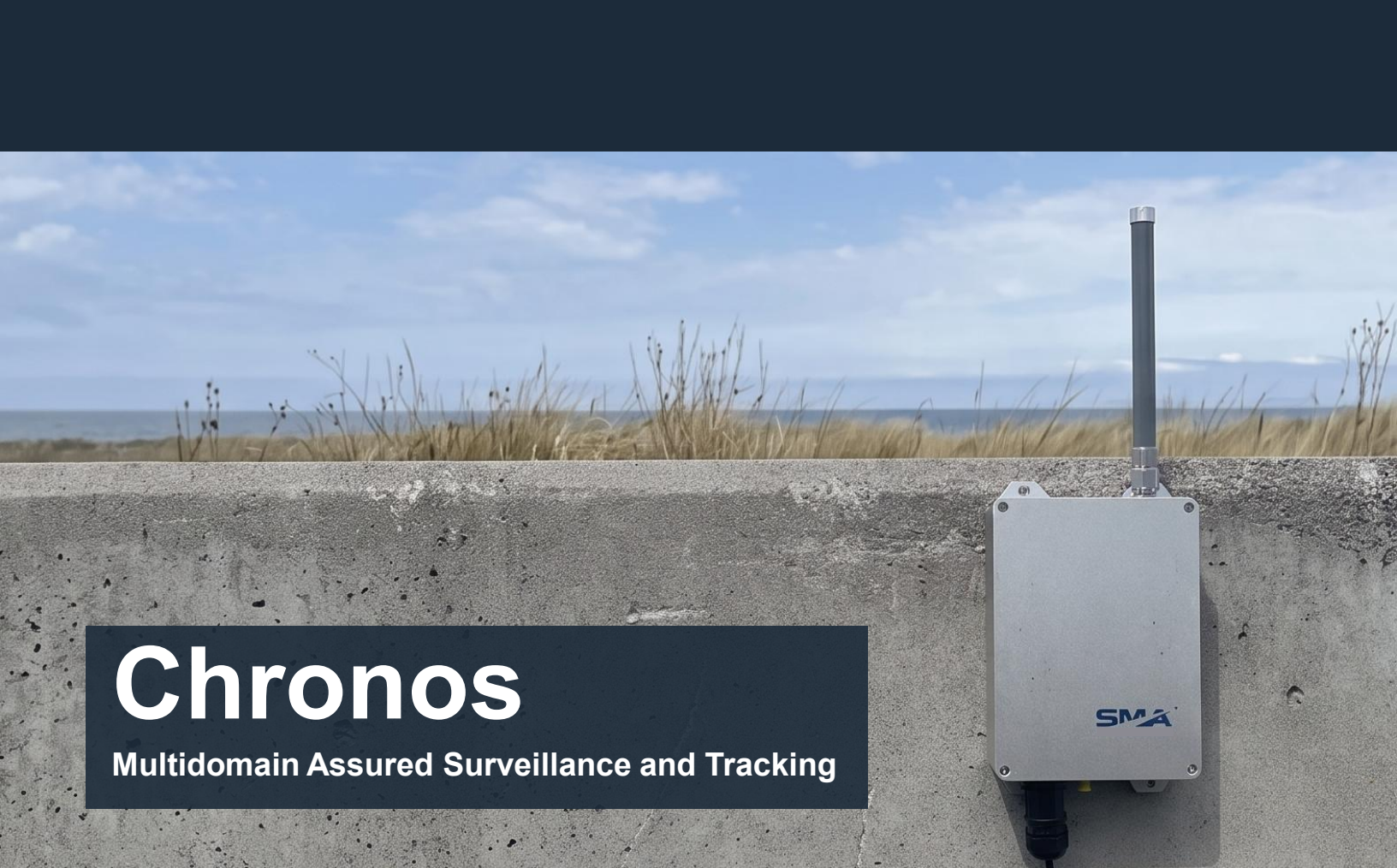




Chronos

Multidomain Assured Surveillance and Tracking

Trusted Situational Awareness of Cooperative Traffic in GPS-Denied Environments

Unified awareness across sea and air

Chronos is a flexible multidomain sensing platform designed to improve and validate situational awareness across air, maritime, and unmanned operations.

It combines everything you need for enhanced situational awareness of cooperative traffic into a single operating picture.

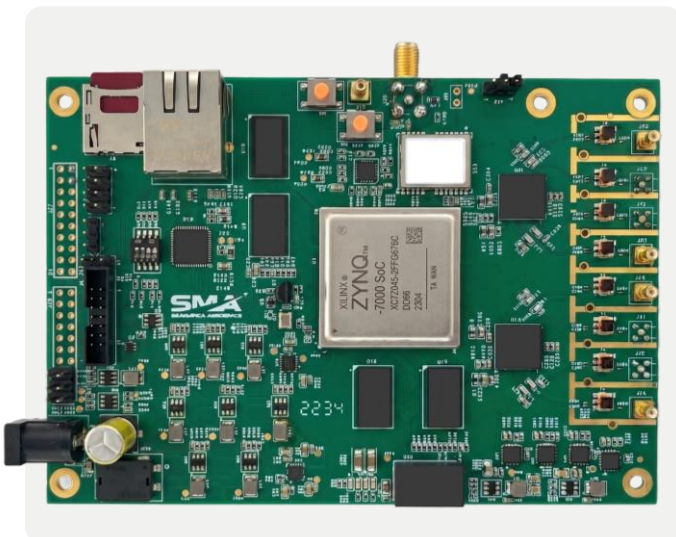
Available in passive and active configurations, Chronos provides scalable surveillance while minimizing unnecessary transmissions and dependence on existing infrastructure.



Supported Modalities

Chronos supports simultaneous tracking and validation across multiple frequencies, enabling **detection of a wide range of cooperative traffic protocols.**

Current configurations supports Automatic Dependent Surveillance-Broadcast (ADS-B), Mode A/C transponder messages, Automatic Identification System (AIS), and RF-based Remote ID. **With further development, Chronos can be configured to any frequency or protocol as needed.**



Core Technology

Chronos uses a configurable SDR architecture to process signals across the 0.07 to 6 GHz frequency range. This allows one platform to handle multiple protocols simultaneously through configurable RF front-ends, eliminating the need to integrate separate sensors from multiple suppliers.

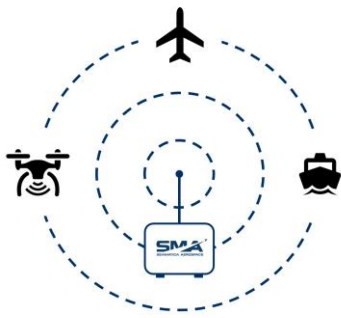
At the heart of Chronos is an SoC architecture combining FPGA fabric with an embedded processing system. The FPGA fabric enables ultra-precise time-stamping (<10 ns precision) and phase synchronization (3° precision).

Passive and Active Operation

When operating within range of a secondary surveillance radar operated by an Air Navigation Service Provider, Chronos **passively detects both radar interrogations and Mode A/C replies from transponder-equipped aircraft**. Using Seamatica's patented technology, **a single standalone Chronos station can process these signals to determine each aircraft's identity and three-dimensional position** without requiring access to ANSP surveillance data.

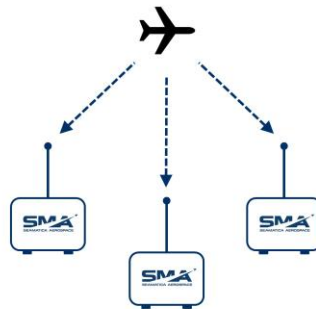
Active Chronos builds on the proven passive platform by adding an integrated transmission capability. This allows the system to **operate independently of nearby surveillance infrastructure and actively detect cooperative aircraft where conventional SSR coverage is limited, unavailable, or unreliable**.

Passive Operation



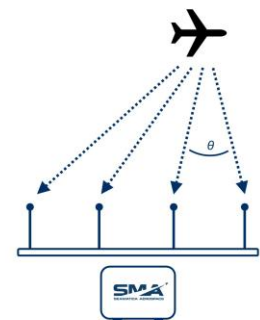
Omni-directional

In addition to receiving and processing ADS-B, AIS, and Remote ID, Chronos can leverage local secondary surveillance radars to intercept transponder replies to independently determine aircraft position.



Multilateration

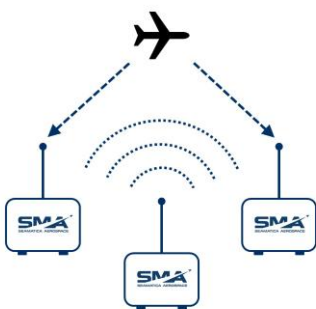
Multiple Chronos stations networked into a scalable wide area MLAT (WAM) system. Expanding coverage while minimizing infrastructure, maintenance, and operating costs.



Phased Array

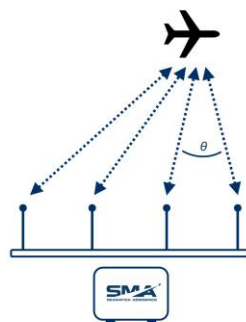
A phased-array architecture provides precise tracking using directional sensing, angle-of-arrival measurements, and improved target localization from a single station.

Active Operation



Multilateration

Unlike the passive version where an SSR is needed for Mode A/C transmissions. A station in the system will interrogate the aircraft while other stations are set to receive. Active Chronos also employs a listen-whisper shout interrogation procedure to reduce frequency band congestion.



Phased Array

With a phased-array architecture, 3D position can be tracked with just one ground-based or airborne station.

Specification

Range:

- Passive Chronos: **150km+**
- Active Chronos: **100km**
- AIS: Ground level vs. elevated
 - 10ft = ~3nm
 - 1,000ft = ~30nm
 - 40,000ft = 200nm

Precision

- Range : **50m**
- **Bearing:** Phased array: **5°**
Multilateration: **< 5°**

Size, weight and Power

- **20 x 14 x 5 cm**
- **<0.5kg**
- **5W**

Detect

Receive cooperative traffic beyond conventional coverage

Chronos detects cooperative air, maritime, and unmanned traffic, supporting **gap filler surveillance** in remote, terrain-masked, or infrastructure-limited environments.

Chronos' **rapidly deployable** design provides an **independent operating picture** for defense and security, UAS operations, disaster relief, search and rescue, and wildfire response.

Verify

Establish an independent position reference

Chronos uses **multilateration** and **phased-array** bearing measurements to independently determine the origin of transmissions without relying on their reported position.

For **assured positioning, navigation, and timing**, known active Chronos ground stations act as reference beacons for an onboard passive Chronos receiver, supporting APNT when GNSS is unavailable or untrusted.

Validate

Confirm reported position and flag inconsistencies

Chronos compares independently derived RF position against the target's reported location from ADS-B, AIS, or Remote ID to confirm consistency and **flag discrepancies and possible spoofing**.

For transponder-equipped aircraft, Chronos fingerprints ANSP SSR interrogations to independently derive the aircraft's position and cross-check it against its ADS-B-reported location.

Flexible Deployment

The Chronos platform is compact, lightweight, and highly portable, allowing rapid deployment across a wide range of operational environments. Its flexible architecture supports installation across multiple platform types.



Ground Station

Suitable for fixed, mobile, or temporary sites.

Ready to install with or without power/network infrastructure.



UAV

Extends line of sight coverage and enables elevated sensing over remote and obstructed environments.



USV

Mobile maritime platform for extended offshore surveillance.



Aircraft

Delivers enhanced situational awareness and extend surveillance coverage for crewed and UAV operations.



EFB-ready



Weatherproof



Rapid-Deploy