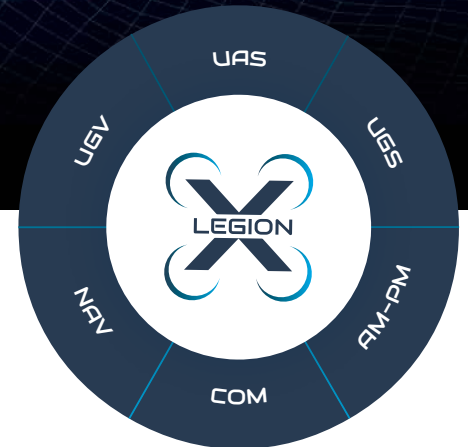


Legion-X

Multi-domain autonomous network combat solutions
for unmanned heterogeneous swarms





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Empowering combat units with autonomous systems is critical for maintaining a tactical edge in multi-domain warfare, with multiple robotic systems requiring the support of a comprehensive networked swarming solution. Operation and management of an array of AI-driven heterogeneous autonomous swarms provides enhanced capabilities to improve situational awareness, combat effectiveness and mission success against peer adversaries.

Elbit Systems has field-proven technology and real-world operational experience in designing, integrating and deploying reliable and scalable robotic and autonomous systems. Featuring sophisticated core capabilities and advanced technologies, Elbit Systems offers comprehensive, intelligent multi-layered solutions for one-to-many autonomous swarms/platforms performing tactical operational missions or in human-machine teaming.

Solution Overview

Legion-X is an autonomous networked combat solution based on robotic platforms and heterogeneous swarms. The innovative modular solution provides a comprehensive, all-in-one system for planning, operation and management of all types of unmanned platforms and missions that enables tactical superiority at all echelons, enhancing efficiency and transforming capabilities in multi-domain warfare. Legion-X provides an advantage in peer/near peer adversary combat scenarios, enabling coordinated deployment of swarms of connected, heterogeneous autonomous platforms and payloads.

Designed to support a wide range of human-machine teaming (HMT) operations, Legion-X enables connectivity and control of air, sea (surface and sub-surface) and land (terrain and sub-terrain) unmanned platforms that extend the range and reach of warfighters and enhance performance in all domains of the modern battlespace. Legion-X can be integrated with any ROS-compliant platform.



Operational capabilities

Legion-X enables control and coordination of a networked group of heterogeneous autonomous systems that can act as a cohesive unit and individually, as part of an overall combat network system. The advanced control solution enables combat teams and expeditionary units to deploy, operate and manage connected human-machine formations and missions in a multi-domain environment. Legion-X supports various mission types: ISR, maneuvering force protection, robotic vanguard, Forward Operational Base (FOB) protection, urban warfare, logistic support and medical evacuations.

Optimal platform management: Legion-X minimizes human engagement with a single point of mission control for units of autonomous systems. The systems can communicate among themselves as heterogeneous swarms and perform individually, capable of receiving information and instructions remotely.

Battlespace coordination and systems integration: Legion-X enables seamless integration of advanced robotic platforms with sophisticated tactical radios and data links, providing robust, continuous and fast connectivity on-the-move that is secured and immune,

with no single point of failure and no dependence on GPS. Communication is based on private LTE, 5G Software Designed Radio (SDR), or any other tactical cloud.

Maximize mission effectiveness: Legion-X supports planning, control and execution of collaborative, synchronized human-machine teaming (HMT) missions with varying levels of autonomy from remote control to fully autonomous capabilities. The solution increases survivability, lethality and combat tempo in a multi-domain environment.

Platform-agnostic and open architecture infrastructure

The Legion-X infrastructure is a cloud-based, distributed software for autonomous systems operation. Elbit Systems' fast and modular E-CiX open-architecture framework comprises commoditized existing building blocks using industry standards and offers its capabilities in "as a service" model. E-CiX includes a rich adaptor layer that allows Legion-X to be platform-agnostic, including a variety of adaptors for C⁴I systems. Agile and scalable, the infrastructure easily interfaces with new or legacy C⁴I systems, can accommodate third-party

applications and provides the development environment for future growth and modularity supported by cloud technologies and cost-saving COTS hardware.

The architecture of the Legion-X autonomous management software is based on a platform manager with advanced AI and a decision management system (DMS) on the edge for platforms connected to a central autonomous management software application for mission planning and execution.

Operational use cases



FOB protection

Legion-X supports heterogeneous fleets of surveillance sensors and interceptors for FOB perimeter coverage, incorporating robotic platforms and drones with aerial observation and firing capabilities and advanced networked sensing technologies. The solution enables deployment of autonomous systems for patrolling and monitoring missions along the base, providing real-time situational awareness for effective incident control and response 24/7 in all terrain and weather.



Tactical force protection

A heterogeneous solution that includes swarms of UAS and UGV to detect, recognize, track and intercept low flying aerial threats (dark drones) and ground threats (humans and vehicles) including drones with no RF signature, low EMI signature, and GNSS-denied navigation capabilities. The multi-layered tactical force protection solution incorporates a variety of autonomous technologies for ground and aerial detection and interception capabilities, non-kinetic and kinetic.



Scan and discover

Autonomous swarms of UAS that can search designated areas of interest for threats, with hours-long continual watch and real-time 3D mapping with target recognition and highlighting capability. The system enables uninterrupted sustained and autonomous overwatch, calculating optimal task performance and asset management. The swarm can designate CAT 2 targets in a congested and contested near-peer combat environment.



Urban warfare

Highly maneuverable search and strike solutions with exterior and indoor operational modes for observation, detection, and urban fighting based on human-machine collaboration. The solution incorporates swarms of ground robotic platforms with weapon stations and heterogeneous drones for street surveillance and search and destroy missions. The solution can be operated directly or with a pre-determined mission plan, for exterior scanning, breaching, interior mapping, human threat identification and classification, and man-in-the-loop firing procedure approval.



**ROBOTIC & AUTONOMOUS
COMBAT SYSTEM**

Legion-X

Multi-domain autonomous network combat solutions for unmanned heterogeneous swarms

Key Features

- Single operator for one-to-many swarms/platforms
- Suitable for all unmanned platforms
- Control of heterogeneous combat swarms
- Autonomous mission management tool
- On edge autonomous platform control management
- Operational in congested and contested combat environments
- Open architecture
- Supports unlimited Concept of Operations (CONOPS)
- Coordinated strike after human confirmation

Key Benefits

- Optimal management in multi-domain environment
- Supports HMT formations
- Platform agnostic
- Reduce cognitive load from the warrior
- Robust connectivity on-the-move
- Enhanced survivability and lethality
- Enhance combat mass
- Decrease risk and casualties
- Increase mobility and sustainability
- Increase combat tempo, efficiency and effectiveness
- Improve decision-making at all levels



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