



IRON BEAM

A HIGH-POWER LASER WEAPON SYSTEM

RAFAEL Advanced Defense Systems has provided pioneering innovations for the global defense industry for more than seven decades, and has accumulated over 20 years of extensive experience and in-depth knowledge regarding Directed Energy (DE) and, in particular, High Energy Lasers (HEL). In the last few years, RAFAEL has achieved significant technological breakthroughs which have allowed the development of a complete HEL weapon system. RAFAEL serves as the National Laser Warfare Center of Excellence, and the National HEL Lethality Infrastructure. Working closely with the Israeli Ministry of Defense, the company was selected as the Prime Contractor for the development of IRON BEAM.

The Need for a New Type of Defense System

Rapidly multiplying and increasingly sophisticated threats have resulted in the critical need to successfully, and in near-real-time, engage airborne threats with C-RAM (Counter Rockets, Artillery, and Mortars) as well as C-UAV (Counter Unmanned Aerial Vehicles including C-mUAV) capabilities. Mini-UAVs have become a substantial emerging threat for both military and civilian installations, with swarms of mini-UAVs increasingly being used for surveillance and attacks, often with explosive

warheads. Current Kinetic interceptors systems are insufficient for comprehensive defense against some of these threats. Therefore, new solutions are being designed and developed to meet the needs of evolving battlespaces. Whether fixed or mobile, they will require a modular configuration, and should be operable either as stand-alone systems or as part of an integrated air defense system.

The Advantages of HEL Interception Technology

High Energy Laser interception systems provide unique benefits that can meet these evolving needs. HEL interceptors can quickly and effectively engage and neutralize a variety of types of threats – including small and short-range ballistic threats such as small-caliber mortars, rockets, artillery, and UAVs of various sizes. These interceptors engage the various types of threats with pinpoint accuracy using an unlimited magazine – while causing limited collateral damage, and at almost zero cost per intercept. They are expected to play a critical role in future warfare – protecting deployed and maneuvering forces and strategic assets, as well as populated and urban areas, from multiple threats.

RAFAEL's HEL History



Tested infrastructure for field tests & risks mitigation

Capabilities Proven

- 2009 - ATGM interception
- 2010 - Mortars interception
- 2012 - Production of BD 500mm
- 2014 - Fast maneuver tracking and interception
- 2015 - UAVs interception
- 2018 - Drones interception by LITE BEAM
- 2020 - Initial integration to Iron Dome
- 2021 - Initiation of IRON BEAM FSD project



BD 300MM
2004-2011

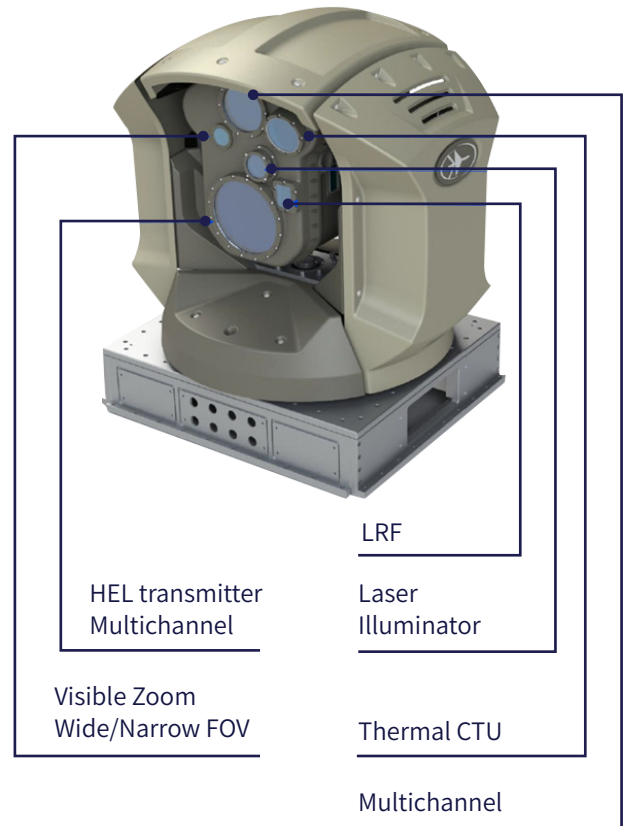


BD 300MM
2012-2020

RAFAEL's Advanced HEL Systems

RAFAEL's development strategy includes the use of a unique, multi-disciplinary team that develops all systems from all aspects. The company has its own state-of-the-art Beam Directors that demonstrate exceptional capabilities, especially in the areas of target recognition, tracking, and atmospheric effect mitigation. Utilizing the same system architecture enables system size and power to be easily adjusted for the required purpose. RAFAEL's systems can be integrated on a variety of platforms as well as on stationary systems. They are designed to operate in diverse dynamic scenarios – from protecting a strategic asset to defending maneuvering forces. Two of RAFAEL's HEL systems – IRON BEAM and LITE BEAM – are described below.

Channels Optical Director Beam



IRON BEAM

- IRON BEAM is a 100kW class HEL interceptor for C-RAM and C-UAVs
- It is expected to become the first operational system in its class
- It can be used as a complementary HEL interceptor for any multilayer air defense array
- The system neutralizes targets from a distance of a few 100 meters up to several kilometers

LITE BEAM

- LITE BEAM is a 7.5kW HEL interceptor for C-mUAVs and ground targets, e.g., IEDs and UXOs
- The first proven prototype is already available
- It can be integrated with any detection or C-UAV system
- It neutralizes targets from a distance of a few 100 meters up to 2000 meters



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