ENPULSION
SPACECRAFT TECHNOLOGY

Nano Lark

The **Enpulsion Nano Lark** is the next-generation FEEP system based on the flight-proven success of our legacy Nano propulsion system. Incorporating lessons learned from a large number of acceptance test campaigns and in-orbit performance verifications, we updated the system's electronics design, thermostructural concept, and software functionality. As a result, the Nano Lark features increased reliability, radiation tolerance, and environmental resilience.

RAD-TOLERANT ELECTRONICS

All EEE components of the Enpulsion Nano Lark are procured in lot-controlled batches. Selected sets of these batches are subjected to radiation testing, so that each thruster can be traced back to a fully representative qualification model. Critical EEE components were selected and integrated to be more tolerant to TID and SEE.

PROTECTIVE CASING

The propulsion system is assembled into a protective casing that shields the electronics from the hazardous space radiation environment, facilitates handling during integration, and allows side mounting.

SAFE AND INERT SYSTEM

The Nano Lark contains no moving parts and the indium propellant is in its solid state at room temperature. Avoiding any liquid and reactive propellants as well as pressurized tanks significantly simplifies handling, integration, and launch procedures.

FLIGHT HERITAGE

The Enpulsion Nano Lark is an updated version of our original Nano propulsion system, which has more than 200 units in space.* It is directly building on its heritage, leveraging the proven design and component selection.
**as per January 2025*

VERSATILE PERFORMANCE

Thrust can be controlled through the electrode voltages, providing excellent controllability over the full thrust range and a low thrust noise.

PROPERTIES AND PERFORMANCE

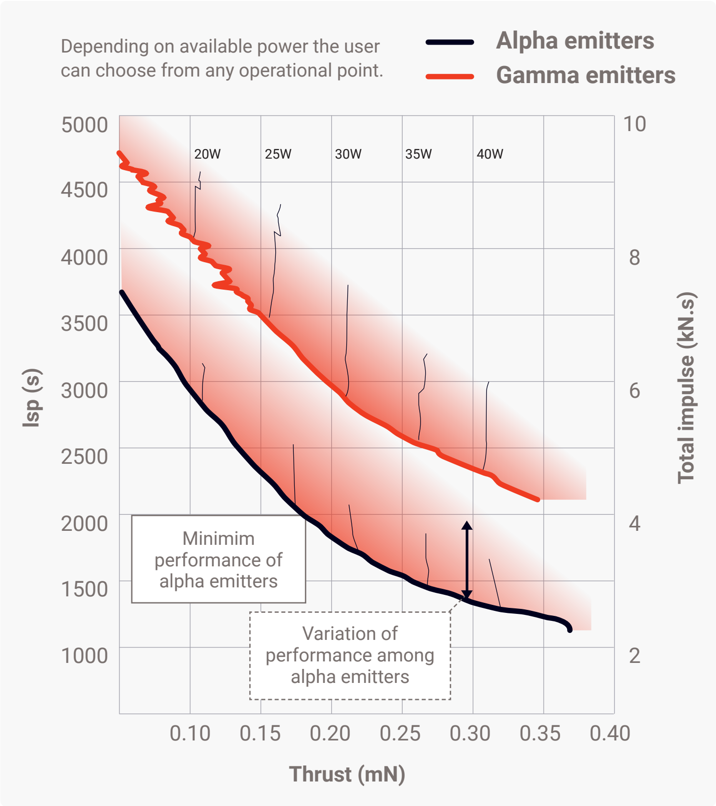
While the required power to operate the Nano Lark starts at around 15 W, at higher power levels one can choose between high-thrust and high-specific-impulse operation. The propulsion system can operate at an Isp range of 1,500 to 4,500 s. At any given thrust point, higher Isp operation will increase the total impulse, while also increasing the power demand. The Nano Lark can be operated along the full dynamic range throughout the mission. This means that high Isp and low Isp manoeuvres can be included in a mission planning as well as high-thrust orbit manoeuvres and low-thrust precision control manoeuvres.

Since the founding of the company in 2016, we have delivered to customers hundreds of thrusters, more than 200 of which are currently in space. We have, therefore, developed an empirical understanding of the intrinsic variation of the performance and parameters of emitters in these thrusters in their production process and in their application in different types of missions. Currently Enpulsion offers an Emitter Selection Service which allows you to select between two distinct types of crown emitters:

Alpha (α) emitters provide the best balance between price, performance, and guaranteed delivery times. This is the perfect solution for commercial constellation applications.

Gamma (γ) emitters are hand-picked for their guaranteed peak performance and are especially appropriate for your missions in deep space, exploration, and others where emitter output needs to be taken to extremes

DYNAMIC THRUST RANGE[1]	50 TO 350 µN
NOMINAL THRUST	350 µN
SPECIFIC IMPULSE	1,500 TO 4,500 s
PROPELLANT MASS	220 g
TOTAL IMPULSE[2]	More than 4,000 Ns
POWER AT NOMINAL THRUST	45 W incl. neutralizer
OUTSIDE DIMENSIONS	98.0 x 99.0 x 95.3 mm
MASS (DRY / WET)	<1280 / <1500 g
TOTAL SYSTEM POWER	15 – 45 W
HOT STANDBY POWER[3]	4 - 7 W
COMMAND INTERFACE	RS422 / RS485
SUPPLY VOLTAGE	12 V



1 The Nano Lark can be operated at a wide range of thrust and specific impulse, depending on the power level available. The operational envelope is based on total system power including typical heater and neutralizers consumption. Performances shown above correspond to maximum thrust to power curves for different grades of emitters.
2 Strongly depends on emitter option. See performance map for selection options.
3 Depends on accommodation and resulting thermal environment