D-ORBIT
NEW SPACE SOLUTIONS

INORBIT NOW

SERVICES FOR SATELLITE PRECISE DEPLOYMENT AND TECHNOLOGY IOD

Matteo Zeni – CDW 2025

CIRCULAR ECONOMY IN SPACE

ENABLING AN EFFICIENT AND WASTELESS USE OF SPACE RESOURCES

OPTIMIZE SATELLITE
BUSINESS AND PERFORMANCE

DISPOSE DEFUNCT
SPACECRAFT

RECYCLE AND ORBITAL
MANUFACTURING

IN-SITU RESOURCES
(i.e. asteroid mining)

SUSTAINABLE
SPACE SETTLEMENT

D-ORBIT

PIONEER IN SPACE LOGISTICS

360
people and growing

19
missions

17
ION launched

180+
payloads in space

- Commercial customers in 4 continents
- Presence in Italy, UK, Portugal and USA
- Leading player in the Space Logistics market

OUR CUSTOMERS

POSITIVE CUSTOMER EXPERIENCE DRIVING REPEAT BUSINESS

New Space

astrocast · planet. · SpacePNT · VEOWARE · EBAD Ensign-Bickford Aerospace & Defense · CRYPTOSAT · KP LABS · albaorbital · STARFISH SPACE · AAC CLYDE SPACE · ISISPACE · WYVERN · SpaceQuest · T4i TECHNOLOGY FOR PROPULSION AND INNOVATION · VISIONA Tecnologia Espacial · spire · HYPERION TECHNOLOGIES · SPACEMIND · HPS · PICOSATS · APOGEO SPACE · OneWeb · K2 SPACE · ENDUROSAT · GLUSOSPACE · telePIX · CYSEC · deimos SPACE · TRL11 · OUTPOST · Odyssey SpaceWorks · Zenno Astronautics · ROCKETSTAR · PRIVATEER · KEPLER · STELLAR PROJECT · PLANIS · Space DOTS · aws · Pale Blue

Traditional Space

beyond gravity · AIRBUS DEFENCE & SPACE · arianeGroup · elt ELETTRONICA GROUP · eutelsat · OHB · AVIO · UNIBAP · ST Engineering · ORBCOMM · LOCKHEED MARTIN · HB TECHNOLOGY · excellence and passion in automatic control design · EICAS Automazione S.p.A.

Institutional

esa · CASIS · EPFL · Technische Universität Berlin · ASI Agenzia Spaziale Italiana · UK SPACE AGENCY · UKRI UK Research and Innovation · ZENTRUM FÜR TELEMATIK · UNIVERSIDAD DE CHILE

CUSTOMERS' DISTRIBUTION

PRODUCTS AND SERVICES

ADDRESSING THE NEEDS OF TODAY WHILE DESIGNING THE TECHNOLOGY OF TOMORROW

Space Transportation Services: solutions to address the needs of the small satellite market in terms of launch and deployment, operations on payloads, including testing of new technologies in orbit.

Satellite as a Service: a model that allows customers to leverage the capabilities of satellite technology without having to invest in and operate their own satellite infrastructure.

Space Cloud Services: an innovative space cloud-based technology that will enable close to real-time data computing and data storage directly in orbit.

In-Orbit Servicing: services powered by proprietary robotic servicing vehicles designed to achieve multiple mission objectives throughout their lifespan (e.g., inspection, assembly, refurbishment, refueling, and debris removal).

Mission Exploitation Services: Aurora, a cloud-based mission control software suite designed to control a single satellite or a complete constellation through a control web interface.

SPACE
TRANSPORTATION
SERVICES

SPACE TRANSPORTATION SERVICES

FROM RIDESHARE TO LAST-MILE-DELIVERY

ION Satellite Carrier is our proprietary orbital transfer vehicle designed to **transport satellites to space and release them into precise, independent orbital slots**, enabling to start their space mission quickly and in optimal operational conditions.

ION is equipped to launch a combination of CubeSats of any form factor, up to 64 CubeSat units in total, or **microsatellites up to 200 kg of mass**.

Extra services include mission analysis and design, platform engineering, software development, acceptance testing, and transportation.

ION SATELLITE CARRIER

ACCESS TO SPACE, SIMPLIFIED AND GUARANTEED

Easy integration: guaranteed access ports during launch integration.

Low tumbling rate: the tumbling rate upon release is kept below 6deg/s.

Precision deployment: each satellite is deployed independently, following a command from the ground, with personalized attitude, pointing and impulse.

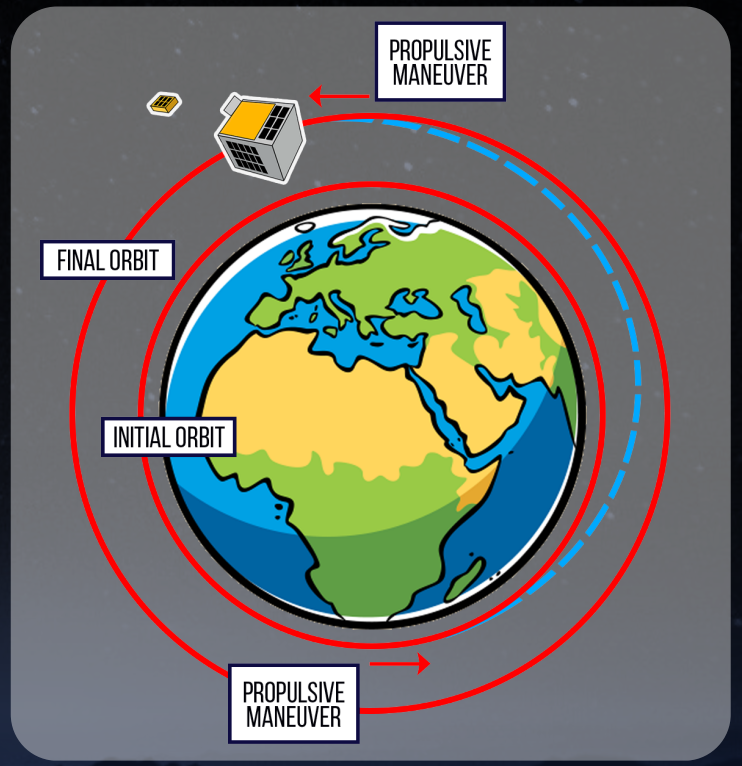
Fast dispersion: up to 85% faster dispersion for constellations, with wider spacecraft separation, faster signal acquisition, and a stable collision-free formation.

Guaranteed deployment: a triple fault-tolerant mechanism guarantees the release of all satellites that may not be released nominally before the end of the mission.

ORBITAL MANUEVERS

CHANGE OF ALTITUDE AND PLANE

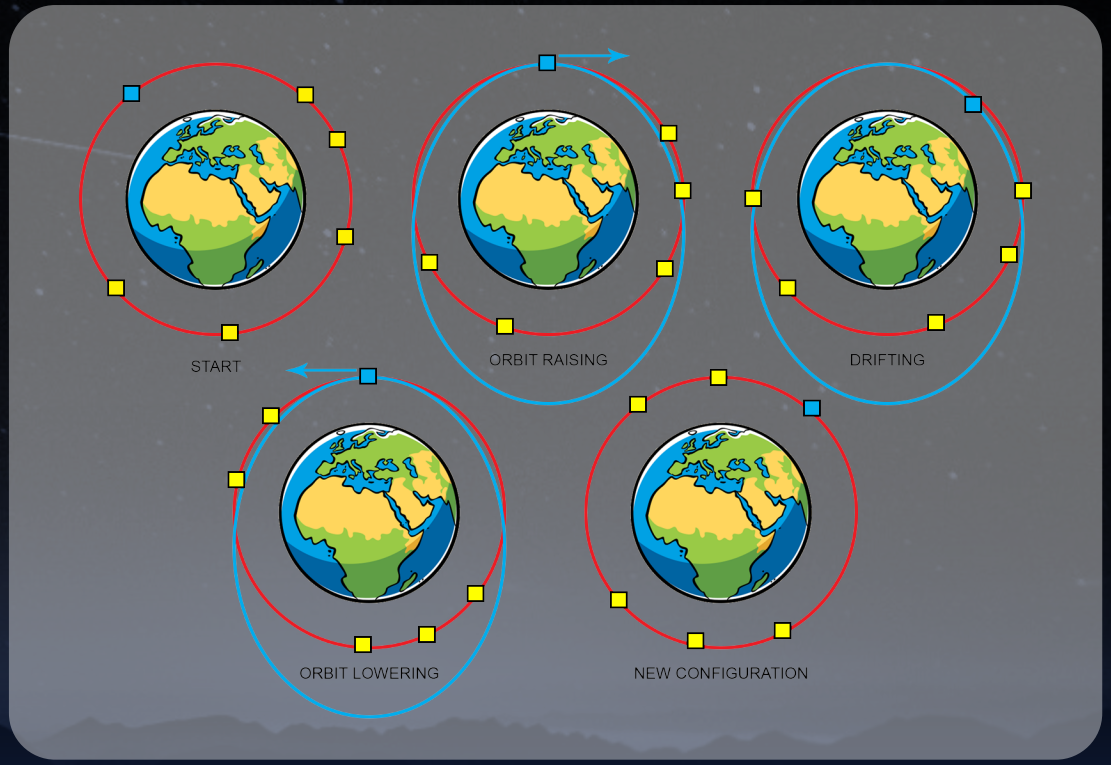
Using its internal propulsion, ION Satellite Carrier can modify its relative position with respect to other satellites within an orbit. With an orbit-rising maneuver, ION moves itself into a higher, slower orbit, and then drift for a few days or weeks, until it is aligned with the new orbital slot. An orbit-lowering maneuver, circularizes the orbit, placing ION into the desired new configuration.



ORBITAL MANUEVERS

TRUE ANOMALY PHASING

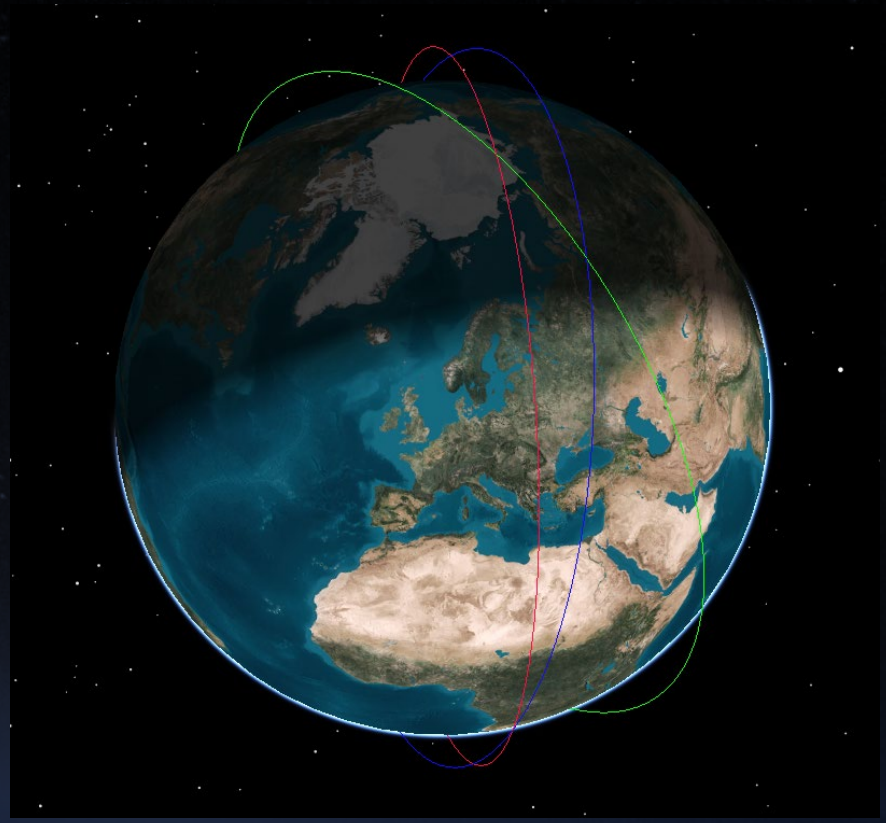
Using its internal propulsion, ION Satellite Carrier can modify its relative position with respect to other satellites within an orbit. With an orbit-rising maneuver, ION moves itself into a higher, slower orbit, and then drift for a few days or weeks, until it is aligned with the new orbital slot. An orbit-lowering maneuver, circularizes the orbit, placing ION into the desired new configuration.



ORBITAL MANUEVERS

RAAN SHIFT

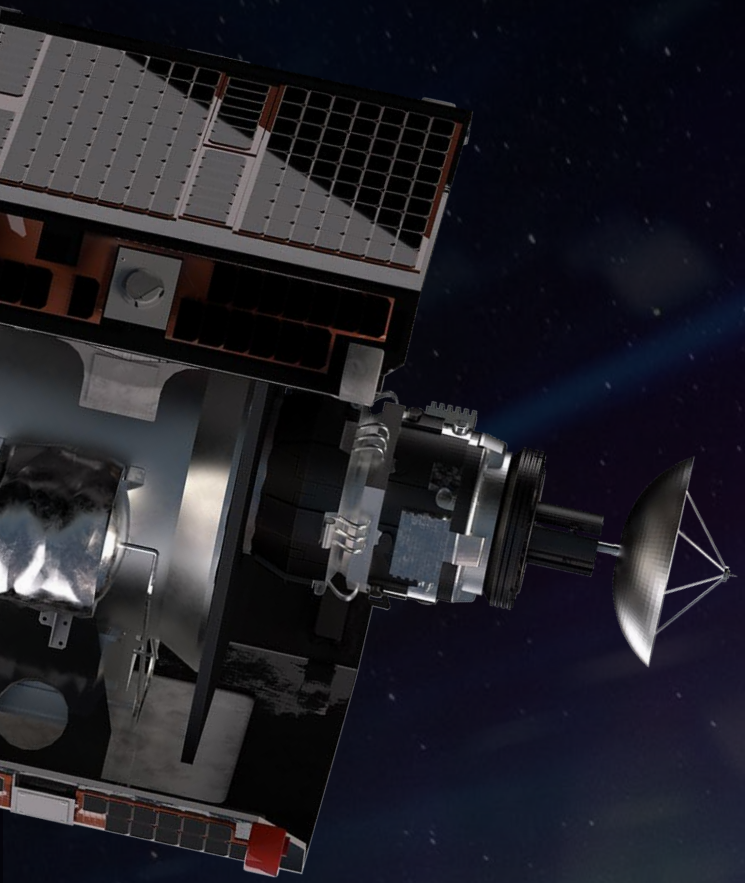
ION Satellite Carrier can change the right ascension of ascending node (RAAN) of its orbit thanks to its propulsion module. The procedure exploits the Earth's oblateness (J2 effect), which torques a satellite orbit. A change in altitude or inclination induces a differential precession of the phasing orbit with respect to the initial trajectory. Once achieved the required RAAN separation, the vehicle performs a counter-maneuver to inject itself into the desired orbital slot.



Original Orbit RAAN Drifting Orbit New Orbit

HOSTED PAYLOAD SERVICES

PERFORM YOUR EXPERIMENTS IN OPTIMAL OPERATIONAL CONDITIONS



A plug-and-play platform to test almost any kind of payload in space, that leverages ION:

Standard, well defined interfaces: Plug-and-play CubeSat mechanical interface, standard 3.3 / 5 / 12 / 28V electrical interface.

Access to host resources: Uplink, downlink, memory, and more.

Wide coverage: A network of ground stations provides multiple daily access opportunities.

Attitude control: Ability to point the platform to perform your tasks with optimal exposure to sun, darkness, Earth, and horizon.

Launch flexibility: Multiple launch options in LEO, SSO every year, with possibility to switch launch in case of delay.

Multi-orbit: Repeat your experiment at different altitude and planes.

Flexible pricing: Pay what you use.

IOD/IOV SERVICES

RELIABLE AND RESPONSIVE TESTING OF INNOVATIVE TECHNOLOGIES IN SPACE

Innovative space technologies need to be tested and proven in space to be ready for the market. Today, this is a complex activity, requiring a minimum of two years and a significant investment.

D-Orbit IOD/IOV service enable companies and research entities to **test a payload in space within 6-12 months**.

Access to host resources: Uplink, downlink, memory, pointing and more.

All included: mission management, integration, launch, operations, and download of the results of the test in orbit.

D-Orbit ensures compliance with the latest standards in **Space Situational Awareness** and **Space Debris Mitigation**.

OUR HERITAGE

17 ORBITAL TRANSPORTATION MISSIONS TO DATE AND A GROWING DEGREE OF COMPLEXITY

2020-1

3 IONs LAUNCHED

First successful commercial orbital transportation mission in the space industry

Successful testing in orbit of innovative plug-and-play system for hosted payloads

- 38 Satellites deployed
- 17 Hosted payloads

2022-3

10 IONs LAUNCHED

ION performs the first RAAN shift maneuver in orbit ever performed by an OTV*

First launch featuring two IONs

- 60 Satellites deployed
- 25 Hosted payloads

2024-5

4 IONs LAUNCHED
(4 more launches scheduled for 2025)

80% of passengers onboard are recurring clients

- 9 Satellites deployed
- 13 Hosted payloads

* Note: Orbital Transfer Vehicle

SATELLITE
AS A SERVICE

SATELLITE AS A SERVICE

YOUR SHORTCUT TO SPACE

D-Orbit helps the customer to get the data that they really want defining the best upstream solution.

The customer can rely on a proven and regularly launched infrastructure, in shared or dedicated missions, fully operated by D-Orbit.

Leveraging on their variety platforms developed, launched, and operated, D-Orbit is offering a new service to give a short-cut access to space.

Our platforms, from 200 kg to 2 tons mass, are designed to operate in LEO or GEO and can host different payloads with a wide range of requirements

SPACE CLOUD
SERVICES

SPACE CLOUD COMPUTING

USING ION AS CLOUD INFRASTRUCTURE NODES

Allows both satellite operators and companies that use satellite data to **process** in **real-time data acquired in orbit** for analytics services, information insights and **other edge computing** or **AI/Machine learning** applications optimising assets in orbit, **currently 30-60%** of data is lost in commercial satellites due mainly to their bandwidth limitations. D-Orbit service enables customers to download significantly more processed information that can be sold immediately.

Takes advantage of the **reduced latency** provided by an **orbital cloud computing infrastructure**, significantly **reducing traditional bottlenecks** to accessing space data.

Customers can **test and validate data-processing applications** on **D-Orbit's proprietary in-orbit cloud computing platform.**

More than a **dozen AI applications** tested in-orbit and approximately **fifteen companies** signed up to test the service.

USE CASES

WHO CAN BENEFIT FROM SPACE CLOUD SERVICES?

DYNAMIC TASKING

Typical problem: How to optimize satellites operations to predict and avoid space collisions?

EARLY WARNING SYSTEMS

Typical problem: How to be reactive and alerted as soon as an event starts on a designated hotspot (*e.g. first responders to fires protected regions*)?

IMPACT MEASUREMENT SOLUTION

Typical problem: How to effectively report on key performance indicators to assess a financial intervention for positive change *(e.g. creation and monitoring of Maritime Protected Areas)?*

EARLY MONITORING

Typical problem: How to monitor and detect changes on critical infrastructure in large remote areas (*e.g. detect leak in oil exploitation*)?

D-Orbit provides the infrastructure and ecosystem to revolutionize the way we manage and utilize space data.

OUR PARTNERS

Launchers

AVIO

arianespace
arianeGROUP

SPACEX

isaraerospace
technologies

INTERSTELLAR TECHNOLOGIES

HyImpulse

Key Industrial Partners

arianeGROUP

AIRBUS
DEFENCE & SPACE

AAC CLYDE SPACE

Marubeni

PORSCHE

beyond gravity

ENDUROSAT

ISISPACE

aws

OUR INVESTORS

INDACO VENTURE PARTNERS SGR

Marubeni

cdp

PRIMO SPACE

NEVA FINVENTURES

SERAPHIM CAPITAL

united ventures

OUR CERTIFICATIONS

WE PURSUE THE HIGHEST QUALITY STANDARDS IN EVERY AREA

TÜV SÜD ISO 9001 EN 9100

Certified B Corporation

RATING DI LEGALITÀ ★★★

International Organization for Standardization ISO 27001

CYBER ESSENTIALS CERTIFIED PLUS

PERFORMED MANEUVERS

OUR HERITAGE

ION Carrier	Launch Date	Maneuver Performed
ION-MK01	2020-09-03	Precise deployment: 12xSuperDoves released in precise orbital slots, avoiding cluster of satellites
SCV-002	2021-01-24	Inclination change for LTAN drift, precise deployment
SCV-003	2021-06-30	Precise deployment, true anomaly phasing demonstration, lowering and circularization at 500km, re-entry drag sail deployment,
SCV-004	2022-01-13	Inclination adjustment, precise deployment
SCV-005	2022-04-01	0.5deg RAAN shift (by changing inclination), precise deployment, -100km altitude decrease and circularization to 400km
SCV-006	2022-05-25	Inclination adjustment, precise deployment, close proximity maneuvers
SCV-007	2023-01-03	>+100km Altitude raise and inclination correction to 645km SSO, precise deployment
SCV-008	2023-01-03	LTAN change, precise deployment
SCV-009	2023-01-31	Altitude increase, precise deployment
SCV-010	2023-04-15	Altitude adjustment, inclination adjustment, precise deployment
SCV-011	2023-06-12	>+100km Altitude raise and inclination correction SSO, precise deployment
SCV-013	2023-11-11	Altitude adjustment, inclination adjustment, precise deployment
SCV-015	2023-12-01	Precise deployment
SCV-012	2024-08-16	Precise deployment, orbit lowering maneuver
SCV-014	2025-01-14	Precise deployment, orbit raising maneuver
SCV-016	2025-01-14	Precise deployment, orbit raising maneuver

PERFORMED IOD 1/2

OUR HERITAGE

ION Carrier	Launch Date	IOD-IOV Performed
ION-MK01	2020-09-03	• Green propulsion system
SCV-002	2021-01-24	• Fully autonomous plug & play star tracker developed • Demonstrator for Remote Analysis of Ground Observations, a short-wave infrared space camera for Earth observation
SCV-003	2021-06-30	• Optical communication device • Autonomous drag sail
SCV-004	2022-01-13	• A hardened operating system with a built-in cryptographic service and key management system to provide end-to-end cyber security protection for satellite communications
SCV-005	2022-04-01	• Emotional/memorial payload
SCV-006	2022-05-25	• Prototype nanosatellite for secure cryptographic applications • Space propulsion system
SCV-007	2023-01-03	• Compact SWIR camera for Earth observation from space • Space propulsion system • Enhanced version of a prototype nanosatellite for secure cryptographic applications
SCV-008		
SCV-009	2023-01-31	• Payload Release ring • Onboard computer • Emotional/memorial payload • Autonomous drag sail

PERFORMED IOD 2/2

OUR HERITAGE

ION Carrier	Launch Date	IOD-IOV Performed
SCV-010	2023-04-15	• Payload for Electronic Intelligence activities • Control moment gyroscope
SCV-011	2023-06-12	• Low-cost, high performance GNSS receiver • Radiation monitor to provide data usable for space weather monitoring purposes
SCV-013	2023-11-11	• Green propulsion system • Onboard Computer • Ka horn antenna • Memorial payload
SCV-015	2023-12-03	• Refueling system • High-temperature superconducting electromagnets • 2x Space edge computing from different companies
SCV-012	2024-08-16	• AI processor • Propulsion system • Onboard camera
SCV-014	2025-01-14	• Cloud ecosystem platform • Propulsion system • Onboard camera • Universal satellite port • Satellite bus platform components
SCV-016	2025-01-14	• Environmental data-gathering unit • Radiation monitor

IN ORBIT
SERVICING

IN ORBIT SERVICING

THE NEXT GENERATION OF D-ORBIT SPACECRAFT

GEA

REIMAGINE SPACE

D-Orbit is working on a next-generation spacecraft, called GEA, with **in-orbit servicing capabilities**, such as rendezvousing, docking with, and taking over the attitude and orbit control functions of another spacecraft for repair, life extension, or disposal.

LATEST ACHIEVEMENTS

RISE

In October, we signed a **€119.6 million contract with ESA** under the Space Safety programme. Under this contract D-Orbit is developing, launching and demonstrating the capabilities of **a vehicle designed to rendezvous with, dock with, and take over the attitude and orbit control functions of another spacecraft** for purposes including life extension, relocation, repair, disposal, and more.

A key aspect of this contract is the development of GEA, **an innovative satellite platform designed to demonstrate in-orbit servicing capabilities in geostationary orbit (GEO)**.

GEA's first mission, called RISE, is slated for 2028.

GEA: GENERAL EXPANSION ARCHITECTURE

EXPANDING D-ORBIT'S REACH

- Designed for fast configurability and assembly
- Intrinsically serviceable
- Multi-mission, multi-environment through physical re-configuration

GEA

MAIN CHARACTERISTICS

REPOSITIONING: Moving existing satellites from one orbit to another orbit to extend useful life / allow for re-purposing.

INSPECTION: Life of modular satellites can be extended via refuelling or component replacement (e.g. battery).

LIFE EXTENSION: Close approach to existing satellites to inspect their status.

MAINTENANCE: Solving malfunctions in satellites in-orbit with the use of an ION allowing to extend useful life.

EMERGENCY: Rescuing satellites launched or drifting into the wrong orbit.

DECOMMISSIONING: Disposing of satellites properly at the end of their life- “active debris removal”.