ASSIST

SPACE

Refuelling Interface

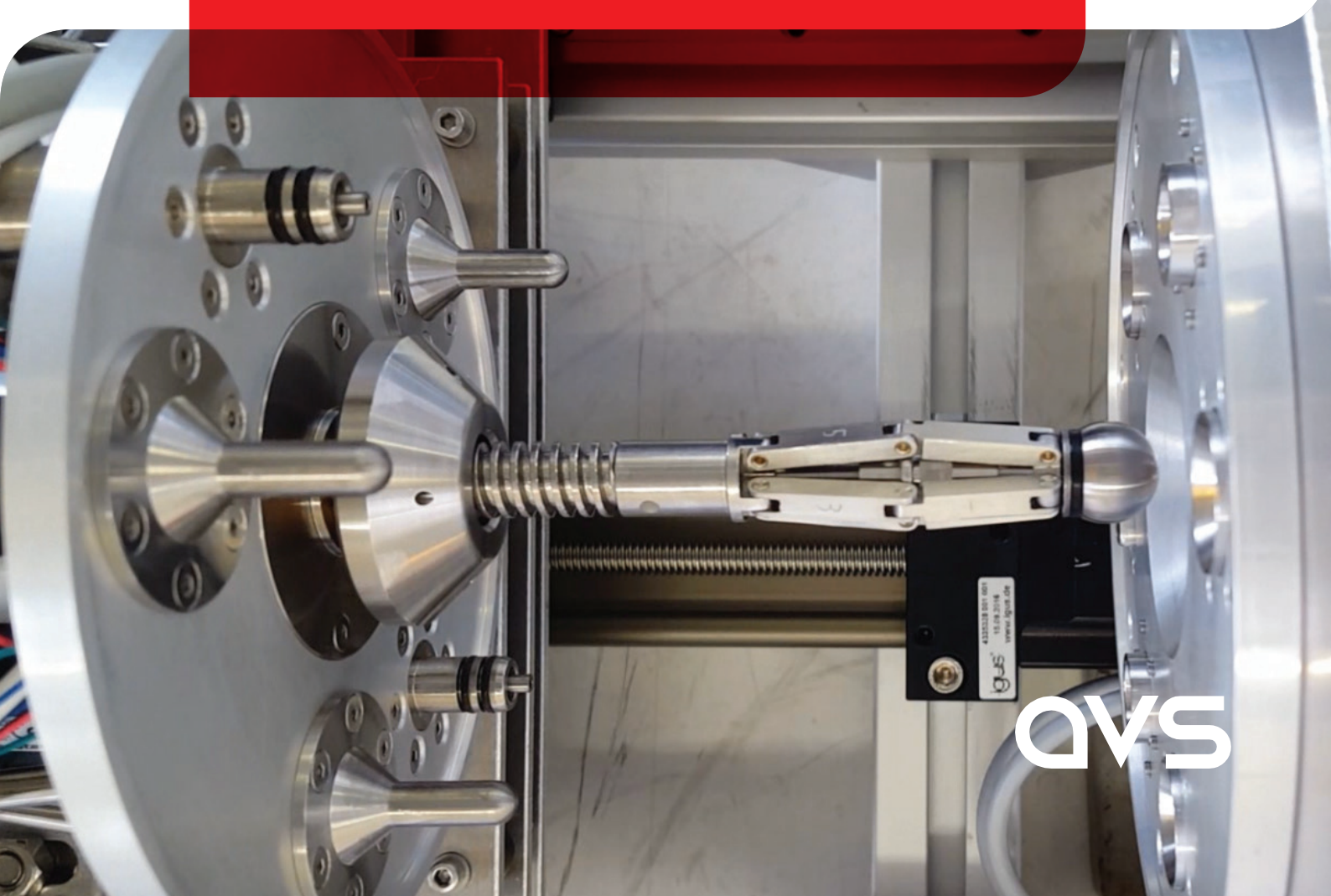
Refuelling interface for in-space transfer of spacecraft propellants

What is *ASSIST*?

ASSIST is an inter-satellite docking and refuelling system based on the International Intersatellite Fuel Transfer System Standard (IIFTSS). It was designed to meet the upcoming needs of on-orbit servicing and space logistics. It has been developed with interoperability in mind and the clear idea of leveraging all the potential of satellite Life-extension and other on-orbit services by making available a non-proprietary specification.

It can handle gaseous and liquid storable propellants for chemical or electric propulsion.

For further information:
If you have an application for ***ASSIST*** and would like more information or to discuss your requirements, please contact the team: **assist@gmv.com**



How does *ASSIST* work?

ASSIST consists of two main elements: an active end-effector installed on the chaser satellite (servicer), and a lightweight fully passive fixture mounted on the target satellite (client).

The end-effector element includes the active grasping mechanism - a mechanical interface composed of an expanding pantograph located at the tip of a probe. The docking fixture features a 'drogue' cavity designed to receive the capture probe's pantograph. Both parts incorporate mating fluidic interfaces and electrical connectors for power and data transmission.

The end-effector is equipped with several actuators that enable the capture of the passive element, alignment of the mechanical connection, establishment of the fluidic and electrical links, and regulation of fluid transfer. The ***ASSIST*** avionics control the active element and provide a telemetry and telecommand interface to the servicer spacecraft.

Main features:

- All-in-one interface integrating mechanical, fluidic and electrical connections.
- Wide capture envelope and large relative velocity tolerance, enabling direct docking operations.
- Up to three high-flow fluidic interfaces compatible with both bipropellant (liquid) and electric (gas) propulsion.
- Electrical power/data link between client and servicer.
- Lightweight, fully passive design on the client spacecraft, minimizing mass and system complexity.

Product roadmap

- Developed up to TRL-4.
- Modular fluidic interface engineering model under development (TRL-5/6 in 2026). Handling green propellants.
- ***ASSIST*** Engineering model under development (TRL-5/6 in 2027).

Latest News

- ***ASSIST*** fluidic coupling development for InSPOC-1 ESA program started in September 2025.
- Engineering model of ASSIST avionics started in September 2025.

Data sheet

Type	Refueling interface
Applications	- Life Extension Services - Space Logistics
Docking tolerances	- +/- 20 mm (lateral) - +/- 5 degrees (any axis) - 15 mm/s (axial) - 10 mm/s (lateral)
Maximum allowable torque (hard-dock)	- 62.5 Nm
Operation times	- Pantograph (soft docking): ~2s. - Clamping collar (alignment): ~60s. - Fluidic plane transfer (connection): ~700s.
Electric interface	- Configurable 8977 Souriau connector
Max operating pressure	- Low pressure: 24 bar - High pressure: 310 bar
Refueling rate	- Variable (from 5 cm3/s to 110 cm3/s) for liquid media - TBD For gaseous media
Compatible media	- Gaseous nitrogen, Gaseous helium - Gaseous xenon - Hydrazine, Monomethyl Hydrazine, Nitrogen Tetroxide - Deionized water Isopropyl Alcohol - Green propellants in next version
Mass	- Active part mechanical/fluidic: 3500 g - Active part electronics box: 1000 g - Passive part: 750 g
Volume	- Active part: 150 mm diameter x 368 mm depth - Passive part: 150 mm diameter x 97 mm depth
Power Input	28 V (DC) 20 W nominal
Communication	- CAN Bus (1Mbps) - Other protocols possible
Operational life	- Active part: 5 years - Passive part: 5 years

ASSIST is a modular system that allows the customer to:

- Configure the number and type of fluidic interfaces (up to three connections).
- Configure the power and data connector pinout.
- Adapt the active end-effector to handle different spacecraft mass ranges.
- Integrate an optional securing mechanism add-on to enhance load capacity during high thrust maneuvers.