

HOTDOCK®

A Multifunctional Coupling Interface for Space & Non-Space Applications



Overview

HOTDOCK® is a product line of mating interfaces for robotic manipulation providing an androgynous coupling to transfer mechanical loads, electrical power, data and (optionally) thermal loads through a single interface. It allows assembly and reconfiguration of spacecraft and payloads on-orbit and on planetary surfaces. It is designed to support launch loads and makes it straightforward to replace failed modules, or to swap payloads and provides chainable data interfaces for multiple module configurations. Mounted on the tip of robotic manipulators, HOTDOCK® performs as a quick connect /disconnect interface for end-effectors and tools.

HOTDOCK®

HOTDOCK® is designed in a coaxial manner to reach maximum packing density, with the central core mechanism for the mating and the external payload ring for the electrical interfaces. It is equipped with a mechanism that allows to mate or de-mate using a single drive unit. Its form-fit contour supports diagonal and off-axis engagement when mating and increases the capacity for mechanical load transfer.

The unique coupling mechanism allows to transfer mechanical loads all along the circumference reaching loads of up to 3kN pulling and 300Nm torque.

Engagement

The geometry of HOTDOCK® supports mating trajectories with angular aperture of up to 130 degrees. This unique feature allows simultaneous coupling of up to three orthogonal (adjacent) devices.

Mating Mechanism

In its nominal configuration called Active, HOTDOCK® provides an actuation mechanism for the mating. A purely Passive mechanical configuration of the device exists to reduce costs. A mating is possible between Active-Active or Active-Passive devices.

Product Configurations

HOTDOCK® is available in different configurations, with the adaptation of the external payload ring to the customer needs (number and type of electrical or fluidic connectors). The design can also adapt to different level of quality and redundancy to adapt the product to the mission requirements (orbit, lifetime...).

HOTDOCK® Specifications

- ITAR/EAR free.

Dimensions

- Diameter: 166 mm / 6.53 in
- Height: 185 mm / 7.28 in (inc. elec and casing)
- Mass: 2.6 kg / 5.7 lbs

Electrical Interface

In standard configuration, for electrical connection (power and data) HOTDOCK® is equipped with space graded D-Sub connectors.

Data Transfer

HOTDOCK® natively supports CAN SpaceWire, Ethernet and EtherCAT data transfer.

APPLICATIONS

- Standardised replaceable units
- Spacecraft assembly and reconfiguration
- Lunar exploration and exploitation
- Robotic end-effector connect/disconnect

FEATURES

- Androgynous Design
- 90-degree symmetry
- Flat profile
- Diagonal engagement possible
- Form-Fit Feature (supports positioning and mechanical load transfer)
- High mechanical load transfer
- Safety and reliability by design
- Dust protection
- Scalable

SERVICES AVAILABLE

- Customisation of mechanical, power, signal and/or thermal transfer performance.

For more information:
spaceapplications.com
aerospaceapplications-na.com

or contact us:
flightproducts@spaceapplications.com

ABOUT SPACE APPLICATIONS SERVICES

Space Applications Services NV/SA is an independent Belgian company founded in 1987. Aerospace Applications North America is our Partner company in Houston, USA.

Our aim is to research and develop innovative systems, solutions and products and provide services to the aerospace and security markets and related industries. Our activities cover manned and unmanned spacecraft, launch/re-entry vehicles, control centres, robotics and a wide range of information systems.



Space Applications Services NV/SA

Leuvensesteenweg 325,
1932 Sint-Stevens-Woluwe
(Brussels Area) – Belgium

+32 (0)2 721 54 84
info@spaceapplications.com
www.spaceapplications.com



www.icecubesservice.com
www.aerospaceapplications-na.com

HOTDOCK®

A Multifunctional Coupling Interface for Space & Non-Space Applications



Device Control

CAN Bus controlled.

Performance Characteristics

Mechanical Load Transfer

Linear (tested)	3.0 kN
Bending (tested)	300 Nm

Fully mated.

Form-Fit Guidance Tolerances

Translational on 3 axes	± 15 mm ± 0.6 in
Angular on 3 axes	± 10 deg

Electrical Power Transfer

28V-100V / 40A (optional PDU/latching current limiter).

Thermal Transfer

By conduction: 20-50W

By fluid transfer (optional): 2,500W

Refuelling

Xenon: up to 200 bar, 10g/s

Leakage: < 1e-4 scc/s GHe

Cryogenic: (In development)

Coupling Operation

Full Coupling Duration : <20sec.

Configurations

- Active (actuated) or Passive device configuration
- Rad-Hard (RH) or Rad-Tolerant (RT) avionics configuration depending on application need

Environmental Characteristics

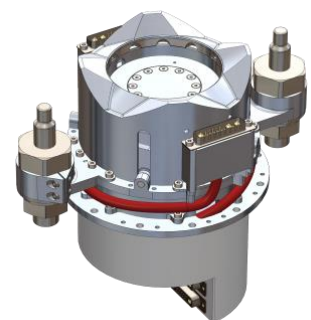
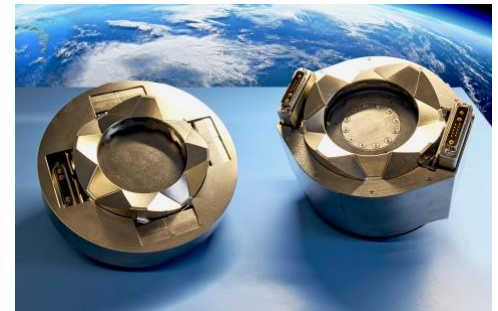
Temperatures	
Active Config.	-60°C / +125°C -76°F / +257°F
Passive Config.	-80°C / +180°C -112°F / +356°F
Target Orbits	LEO, GEO, Interplanetary
Life in LEO	7+ (RT avionics)
Life in GEO	15+ (RH avionics)

Customisation

Please contact us for customisation or special applications:

- Different dimensions
e.g. of CubeSat Configuration:
Diameter: 75 mm / 2.95 in
Height: 30 mm / 1.18 in
Mass: 0.30 kg / 0.66 lbs
- TTEthernet
- Extended thermal range and dust protection for lunar and planetary applications
- Fluidic thermal interface for increased heat transfer (28 mm² / 0.044 in² cross section for hot and for cold channels) capable of more than 2.5KW of heat transfer

Space Applications Services reserves the right to change the specification of HOTDOCK® at any time without notice.



Space Applications Services NV/SA

Leuvensesteenweg 325,
1932 Sint-Stevens-Woluwe
(Brussels Area) – Belgium

+32 (0)2 721 54 84
info@spaceapplications.com
www.spaceapplications.com



www.icecubesservice.com
www.aerospaceapplications-na.com