

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. 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 (patent pending) coupling mechanism allows to transfer mechanical loads all along the circumference reaching loads of up to 8kN pulling and 600Nm 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. HOTDOCK is designed with reliability and safety in mind such that if one of the devices in an Active-Active doubled mating is inoperable (e.g. power failure), the other device is still able to de-mate.

Product Family

HOTDOCK is a scalable product available in different dimensions optimised for specific needs and budgets – from CubeSats to payloads of opportunity, Earth Observation payloads, spacecraft life time extension, large structure assembly or deorbiting operations.

HOTDOCK Specifications

It is ITAR/EAR free.

Dimensions

Diameter:	148.5 mm
Height:	92.4 mm (inc. elec and casing)
Mass:	1.28 kg

Electrical Interface

For electrical connection (power and data) HOTDOCK is equipped with diploid POGO connectors.

Data Transfer

HOTDOCK natively supports SpaceWire and Ethernet.

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 please visit:
<https://www.spaceapplications.com>

or contact us:
hotdock@spaceapplications.com

ABOUT SPACE APPLICATIONS SERVICES

Space Applications Services NV/SA is an independent Belgian company founded in 1987, with a subsidiary 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.



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HOTDOCK

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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
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

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

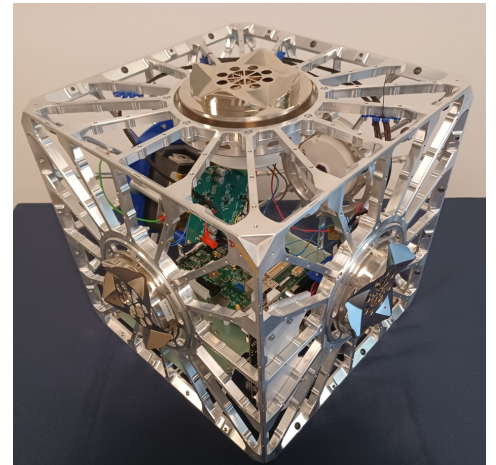
Temperatures	
Active Config.	-60°C / +125°C
Passive Config.	-80°C / +180°C
Target Orbits	LEO, GEO, Interplanetary
Life in LEO	7+ (RT avionics)
Life in GEO	15+ (RH avionics)

Customisation

Please contact us for customisation or special applications:

- Different dimensions
e.g. of CubeSat Configuration:
Diameter: 75 mm
Height: 30 mm
Mass: 0.30 kg
- TT Ethernet
- Extended thermal range and dust protection for lunar and planetary applications
- Fluidic thermal interface for increased heat transfer (28mm² 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



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