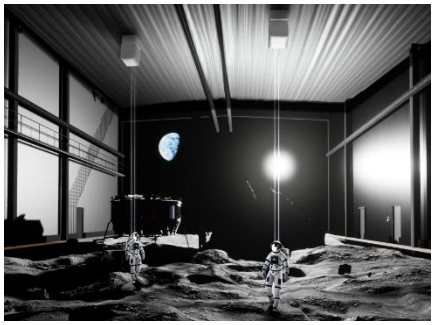
Mobile Gravity Off-loading System (MOGOS)

Scalable Multi-Agent Gravity Off-loading Solution

Overview

Space Applications Services developed a novel Mobile Gravity Off-loading System providing gravity off-loading to multiple people, rovers and equipment allowing each to freely move and interact without the usual constraints of crane-based solutions. The system allows physically close interactions and can accurately follow the natural movements of a person hanging below the vehicle.



Mobile Gravity Off-loading System

System Features

The system comprises of a **Ceiling Structure** with T-profiles integrated with multiple **CeiliX Vehicles**, each equipped with a **Gravity Off-loading Unit**.

Each mobile unit operates independently across the ceiling frame, featuring omnidirectional mobility to maximize the range of motion for individual payloads. The vehicles accurately track and respond to the natural movements of the persons/payloads beneath them.

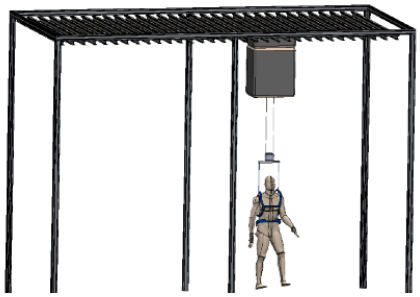
The gravity off-loading unit employs an adjustable semi-passive mechanism based on a constant-force energy storage principle. This guarantees a high level of safety while providing a force output ranging from 0.1g to 1g. The system is engineered to be devoid of inherent inertia, a crucial benefit that supports dynamic movements.

A suspension cable ensures a secure connection between the off-loaded payload and its corresponding mechanism.

System Options

The Mobile Gravity Off-loading System is available in two configurations:

Self-Standing Frame: This option can be installed in various indoor environments, providing flexibility in placement.



Self-Standing Frame

Building Retro-fitted Structure: The system ceiling structure is securely mounted on the building's existing structure. This solution allows much larger work surfaces, making it suitable for larger operational areas. The ceiling structure is adaptable and scalable to any building geometry.

Building Retro-fitted Structure

The Mobile Gravity Off-loading System is offered as Commercial-Off-The-Shelf (COTS) product with customization options available to meet specific requests.

APPLICATIONS

- Astronaut EVA training
- Micro-gravity system technology testing
- Payload deployment and tests under gravity off-loading
- Overhead assembly of large structures
- Health rehabilitation centres

SERVICES AVAILABLE

- Installation on site
- System commissioning
- Operators training
- Maintenance

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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.

MOGOS

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Mobile Gravity Off-loading System Specifications

Ceiling Frame		
Ceiling Type	Self-Standing	Building Retro-fitted
Dimensions	Up to 40 m2 Up to 430 sq ft	No limitations
Mass	37 kg/m2 7.6 psf	
Rails with integrated power bus	240V AC 50Hz 120V AC 60Hz	

CeiliX Vehicles				
Vehicle Type	Small	Medium	Large	Passive
Dimensions	58 x 40 x 22 cm 23 x 16 x 9 in	75 x 79 x 25 cm 30 x 31 x 10 in	80 x 85 x 35 cm 32 x 34 x 14 in	70 x 75 x 20 cm 28 x 30 x 8 in
Mass	25 kg 55 lbs	40 kg 88 lbs	60 kg 132 lbs	30 kg 66 lbs
Load capacity	100 Kg 220 lbs	250 Kg 551 lbs	400 Kg 880 lbs	250 kg 551 lbs
Velocity (single axis)	2.5 m/s 8.2 ft/s			n/a
Ceiling Peak Power	Battery powered	2.5kW	5kW	n/a
Human Rated	No	Yes	Yes	Yes
Positioning sensor	Odometry, Ultrasonic Ranging Sensors			n/a
Connectivity	5GHz mesh network			n/a

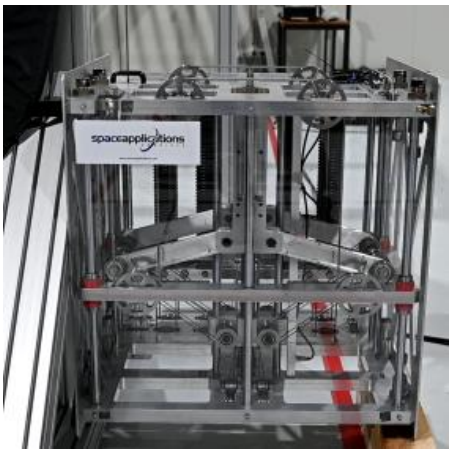
Gravity Off-loading Unit (Constant Force Module – CFM)			
CFM Type	Small	Medium	Large
Dimensions	65 x 30 x 35 cm 26 x 12 x 14 in	70 x 52 x 62 cm 28 x 20 x 25 in	85 x 65 x 55 cm 34 x 26 x 22 in
Mass	40 kg 88 lbs	110 kg 243 lbs	140 kg 309 lbs
Off-loading capacity	1 – 100 kg 2 – 220 lbs	4 – 150 kg 9 – 330 lbs	5 – 250 kg 11 – 550 lbs
Max stroke	1.0 m 3.3 ft	2.0 m 6.6 ft	2.0 m 6.6 ft
Human Rated	Yes	Yes	Yes

Optional Active Winch		
Mass	60 kg 132 lbs	To be added to the CFM mass
Load capacity	up to 250 kg up to 550 lbs	No high dynamics motion
Winch stroke	8 m 26 ft	Configurable

Ceiling Frame with S-size CeiliX Vehicle

Ceiling Frame with M-size CeiliX Vehicle

Constant Force Module - CFM



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