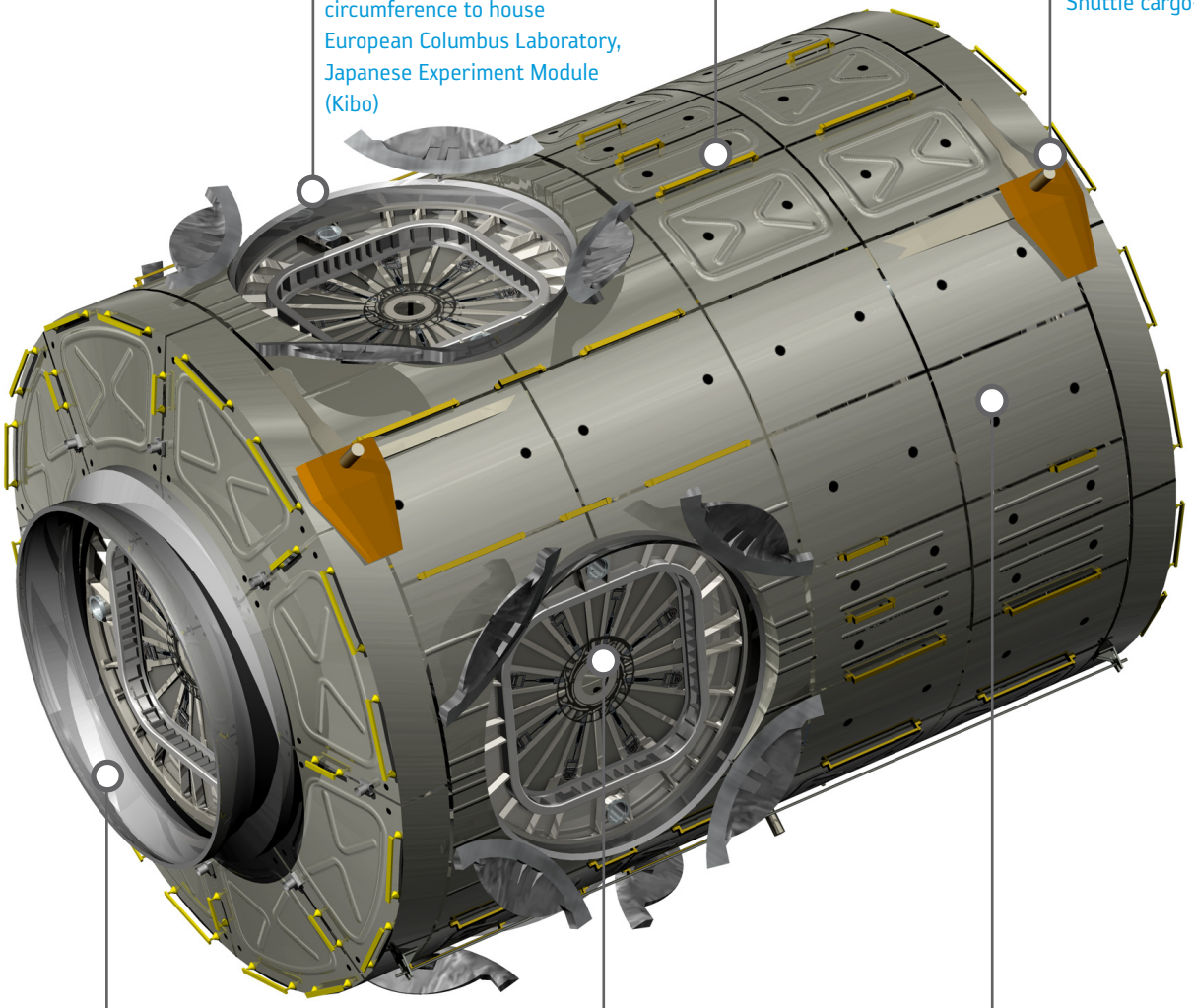
→ NODE-2 HARMONY

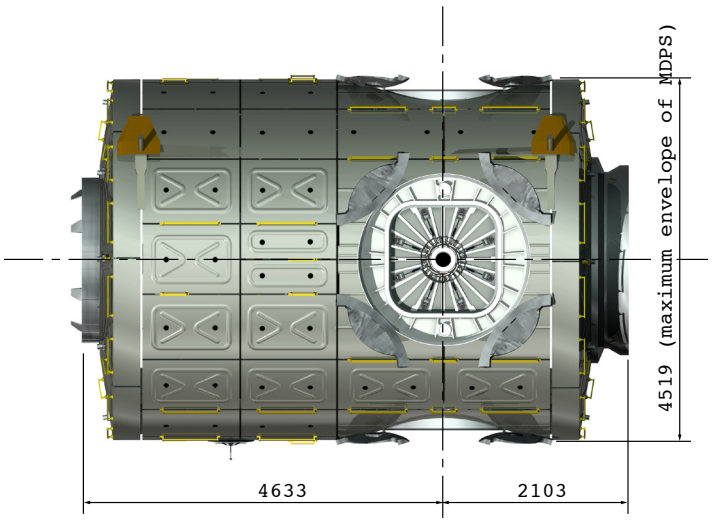
Connecting module

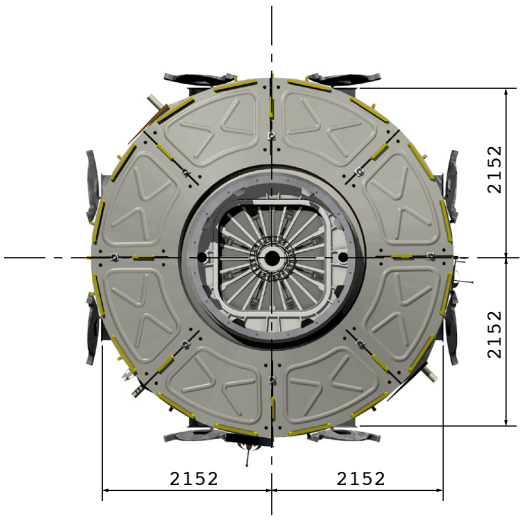
Node 2 controls and distributes resources from the Truss structure and the US laboratory Destiny to the connected elements: European Columbus Laboratory, Japanese Experiment Module (Kibo), H II Transfer Vehicle, Space Shuttle. It also provides a working base point for the Space Station Remote Manipulator System.

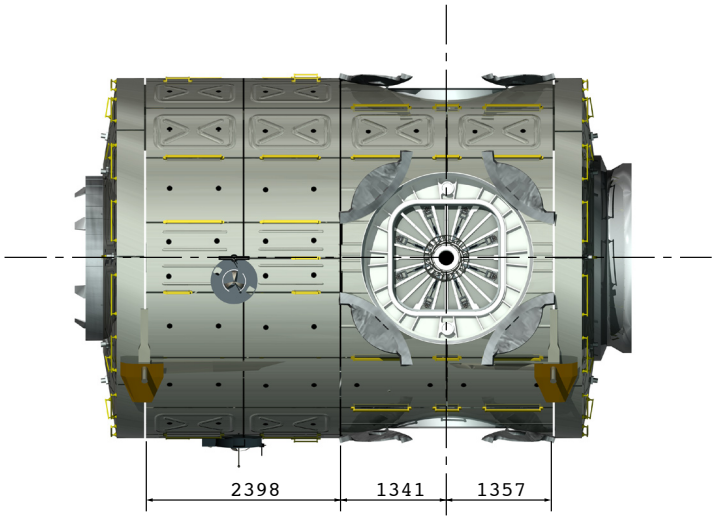


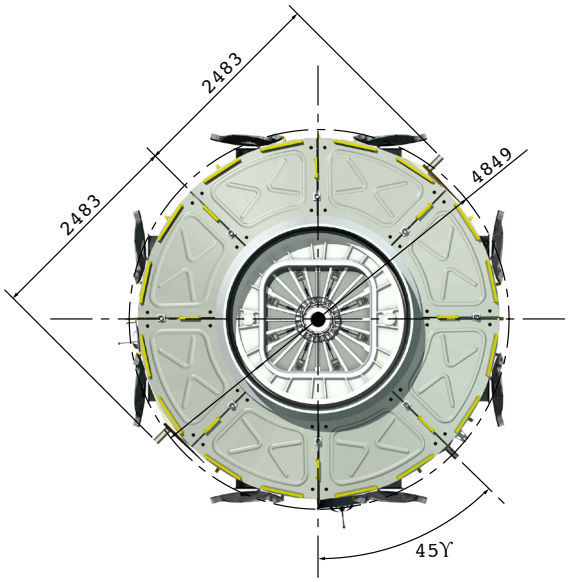
esa	PROJECT: International Space Station	
TITLE: Node-2	DOCUMENT N°: ESA-HSO-COU-005	REV. 2.0

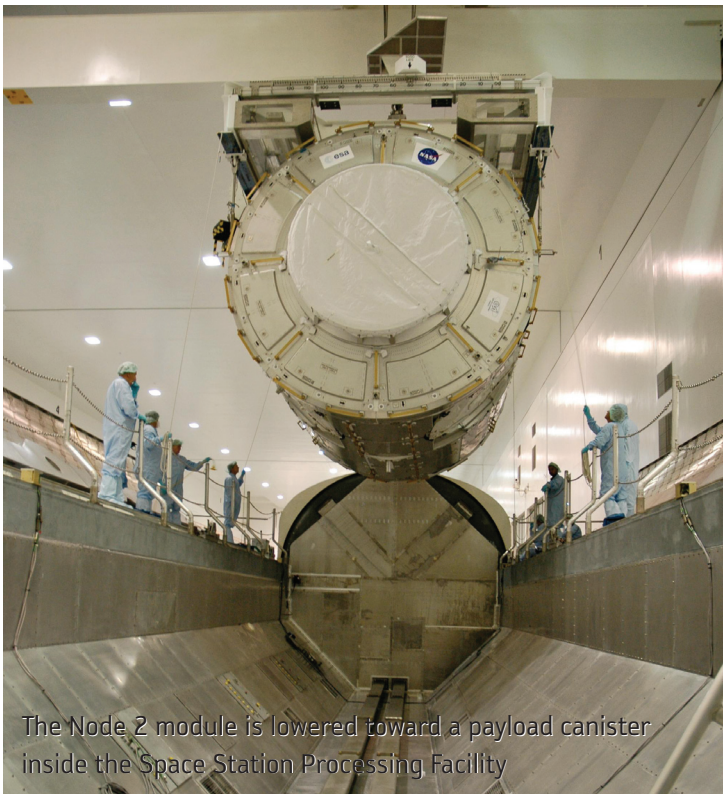
ERASMUS Centre - Directorate of Human Spaceflight and Operations



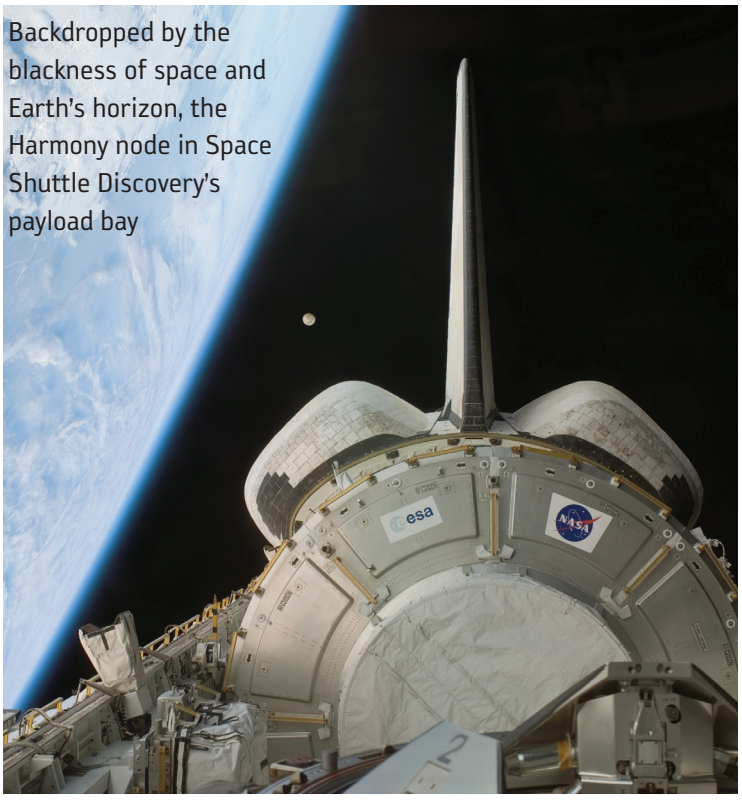








The Node 2 module is lowered toward a payload canister inside the Space Station Processing Facility



Backdropped by the blackness of space and Earth's horizon, the Harmony node in Space Shuttle Discovery's payload bay

Specifications

DIMENSIONS

Length:	7067 mm
Diameter:	4216 mm
Maximum envelope of MDPS:	4472 mm

MASS BUDGET

Launch mass:	14500 kg
On orbit payload mass:	14787 kg

COMMUNICATIONS AND DATA INFRASTRUCTURE

Audio and video communications via optical fibers, analog lines and coax.
Data acquisition and processing to support: power distribution, thermal control and environmental control inside the Node as well as data exchange between Node and all attached elements including Space Station Remote Manipulator System.

ENVIRONMENTAL CONTROL

Cabin ventilation via Inter Module Ventilation Ducts.
Atmosphere sampling.
Temperature and humidity control.
Nominal and emergency illumination.
Fire Detection and Suppression.

ELECTRICAL POWER

Regulation and distribution of electrical power to attached elements and internal Node loads, sized for 56 kW.

MAIN CONSTRUCTION MATERIAL

Pressure shell:	Aluminum 2219 - T851
Micrometeoroid and orbital Debris Protection System:	Aluminum Al-6061-T6, bumper for the primary barrier Kevlar/resin panels for the secondary barrier.
Thermal control:	Goldised Kapton Multi-Layer Insulation blanket.

OWNERSHIP AND DEVELOPMENT AUTHORITY

Technical and programmatic responsibility delegated by ESA to ASI. Developed by ESA for NASA (final owner) under a barter agreement for the launch of the European Columbus Laboratory by the US Space Shuttle.

MAIN CONTRACTOR

Thales Alenia Space (Turin, Italy), leading a consortium of European subcontractors.

esa	PROJECT: International Space Station	SCALE: 1:75 DIMENSIONS: mm
TITLE: Node-2	DOCUMENT N°: ESA-HSO-COU-005	REV. 2.0

A model of the Harmony node floats freely near ESA astronaut Paolo Nespoli on the middeck of Space Shuttle Discovery while docked with the International Space Station

NASA astronaut Peggy A. Whitson, ESA astronaut Paolo Nespoli and cosmonaut Yuri I. Malenchenko work in the Harmony node

Utilisation relevant data

LAUNCH CONFIGURATION

Launched with 4 racks installed, remaining racks installed on orbit.

Launch vehicle: Space Shuttle (Flight 10 A)
Launch site: Kennedy Space Center
Launch date: 23 October 2007

ON ORBIT CONFIGURATION

After temporarily being attached to the port side of the Unity node, it was moved to its permanent location on the forward end of the Destiny laboratory on 14 November 2007.

FLIGHT HARDWARE

4 avionics racks
4 rack locations utilized for stowage or crew quarters

CONTROLS AND DISTRIBUTES

Electrical power (56 kW, stabilized 120 V dc).
Low and medium temperature water cooling.
Inter-module ventilation.
Atmosphere sampling.
Waste water and fuel cell water.
Oxygen and Nitrogen.

EXTERNAL SECONDARY STRUCTURES

Meteoroids and debris protection panels (98 panels with different characteristics like single or double bumper, shapes and dimensions).
Support restraints and mobility aids for EVA operations.
Power and Data Grapple Fixture which serves as a base point for the Space Station Remote Manipulator System.
Flight Releasable Grapple Fixture used for deployment from Space Shuttle cargo bay.