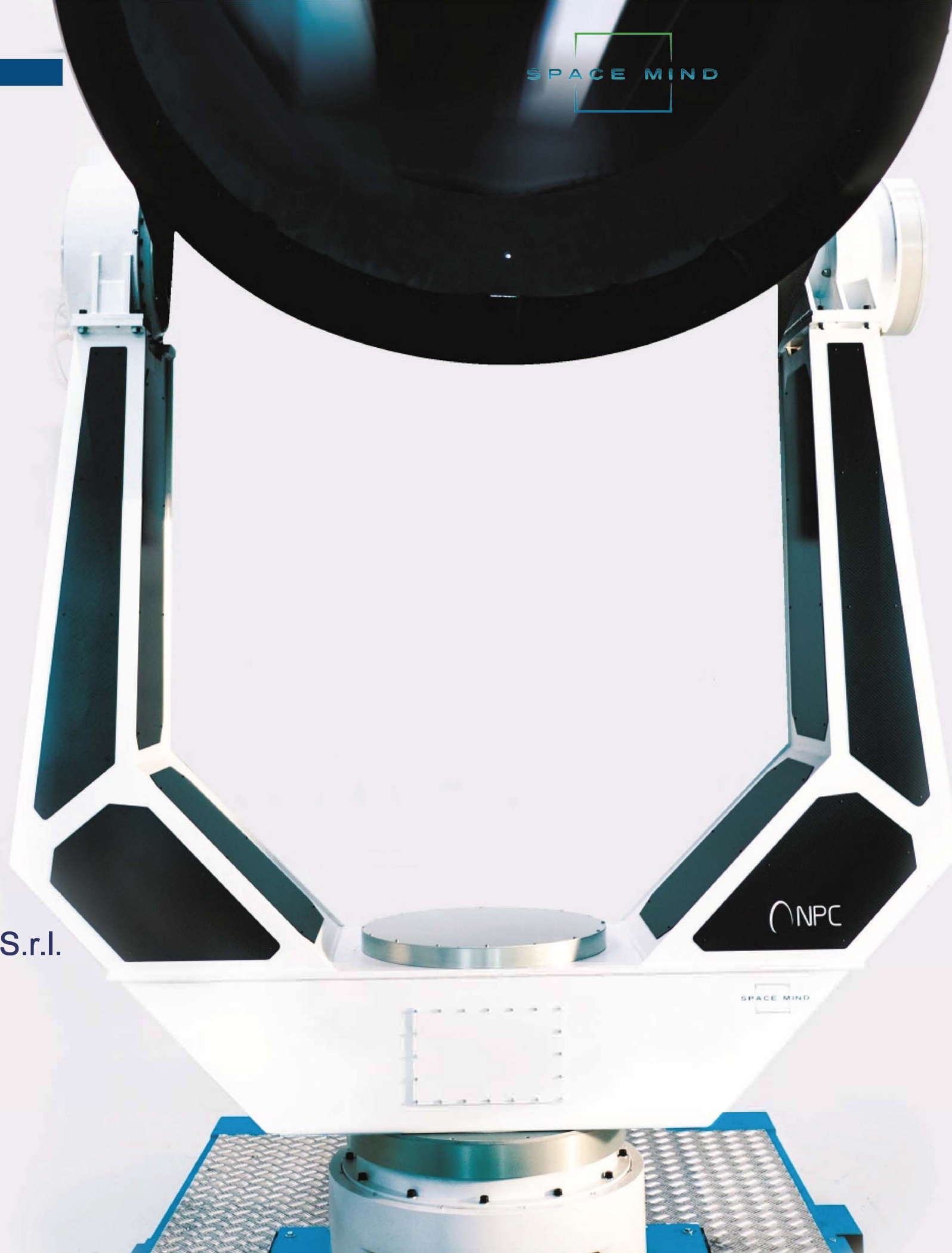


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SPACE MIND

 **NPC**
new production concept



N.P.C. New Production Concept S.r.l.
Via Errico Malatesta 27/29,
40026 Imola (BO), Italy

npcitaly.com - +39 0542362000

d.rastelli@npcitaly.com
n.bellini@npcitaly.com

MOR.AL

HIGH PERFORMANCE ALT-AZIMUTH
POINTING/TRACKING SYSTEM

MORAL (Mount Robotic Alt-azimuth) is an Alt-Az mount designed to satisfy the needs of many applications that require high accuracy, precision and fast pointing of in-orbit objects. Requirements have been defined in order to obtain a high quality solution for observation of really fast objects in LEO and specifically, to offer a prime quality instrument for space debris monitoring and tracking.

OPTICAL SYSTEMS

SATELLITE LASER RANGING



The design of MORAL has been maintained flexible with through-hole shafts and multiple access point to make the system suitable for Satellite Laser Ranging applications.

A fully parametric and easy-adaptable product dimensioned to withstand a large scale of loads (both mechanical and electrical) in which the level of the performance can be adjusted according to the needs.

The modular design permits an easy maintenance even in harsh conditions avoiding the need of fully disassembling of the mount (patent pending).

MORAL can have a variable number of power and data signals directly to the Altitude axis maintaining free 360° rotation.



FAST POINTING HIGH ACCURACY

MORAL exploits direct drive motors eliminating transmission hardware between the motor and telescope axes, with values of torque up to 660 Nm.

High resolution absolute optical encoders measure mount angular motion with an extreme precision, with a resolution of 0,01 arcsec directly on telescope axes.

High precision bearing units associated to an optimized mechanical design ensure excellent dimensional stability during operations.

The electrical hardware is already designed to provide and withstand higher level of velocity if required.

MORAL has been designed using aerospace methods and tools for structural optimization to ensure dynamic stiffness during operations.

A reference load of 10000 N has been considered for static dimensioning, ensuring positive margins of safety and limited displacement.

EASY HANDLING AND ACCESS TO COMPONENTS

The handling of the system has been studied in order to realize a product that can be easily inspected allowing a replacement of the main components avoiding the full disassembly of the system.

Motors can be removed easily for inspection and maintenance.

Encoders and controllers can be removed as well individually for maintenance.

The braking system ensures that maintenance operations can be carried out in safe conditions.

Material	s355 Steel -antirust Paint
Weight	ca 750Kg
Height/Width	2310/1902 mm
Distance between Plates	1359 mm
Nominal /Maximum Load	5000/10000 Kg
Protection	Protective seals
Treatment	Rust protective painting
Power Supply	230 VAC
Max Torque Az/El (peak)	660/500 Nm
Current Peak per motor	17.5 A
Max Operative velocity MSR	30 °/sec
Maximum acceleration	Settable (>60 °/s ²)
Rotation angle on azimuth	Unlimited rotation (>360°)
Rotation angle on elevation	0 – 180°
Pointing accuracy	<2 Arcsec
Min Alt axis braking time	<100 ms
Software and Interface	ASCOM Platform Driver GUI Controlling PAD TCP Server socket -open comm. protocol
Electrical line	Fixed PWR and signal lines 2A @ 24V Custom power and signal lines: standard is 4 x 250VDC/VAC – 10A, 2 USB 1.0/2.0
Operative Temperature	-30°÷40° C
Storage Temperature	-40°÷60° C

NPC can offer high level of standard of the final product starting from quality control on parts and assembly procedures.

