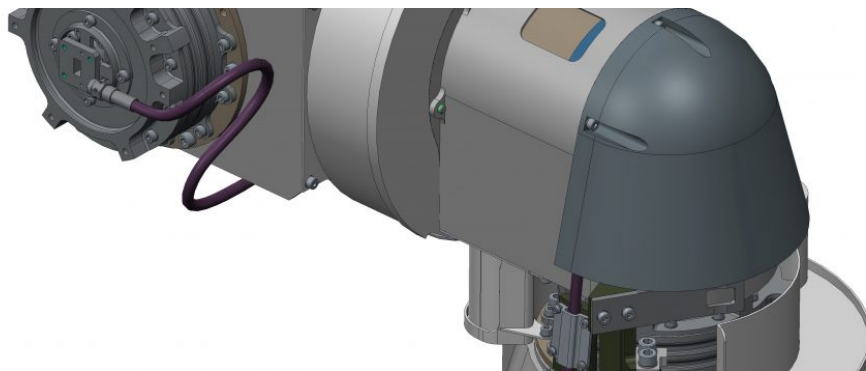




# High gain Antenna Deployment and Pointing Mechanism of the Euclid probe



SENER AEROSPACE & DEFENSE / SPACE / COMMUNICATIONS / SPACE

*HIGH GAIN ANTENNA  
DEPLOYMENT AND  
POINTING MECHANISM  
OF THE EUCLID PROBE*

**Cliente: TAS-E / TAS-I / ESA**

**País: Space**

Sener is developing the high gain antenna deployment and pointing mechanism (HGA ADPM) for the Euclid scientific space probe. It is a precision assembly comprised of three axes, one for antenna deployment and the other two for pointing. The assembly transmits two radio-frequency signals from the satellite to the antennae. The signals are on the K band (between 25.5 and 27 GHz) for the high gain antenna, and on the X band (between 7.1 and 8.5 GHz) for the low gain antenna.

## MAIN MECHANISM COMPONENTS:

- **Actuators:** The number of actuators and rotation axes are the same. In this case there are three: for deployment, azimuth, and elevation. Each one of them comprises among others:
- Stepper motor



- Integrated bearing system
- Gear (harmonic)
- Positioning sensors (fine and coarse potentiometers for each Az. & El.))
- Machined parts
- Internal ball bearing
- **K band rotary joint:** a rigid joint used to transmit the radiofrequency signal despite the assembly's rotation. There is one on each actuator.
- **X band cable:** used to transmit the X band signal.
- **Flexible cable:** used to send the electric signals and power to the actuator, sensors, thermistors and thermal resistances.
- **L-structure:** the structural element that joins the actuators.
- **Support:** the structural element that joins the deployment actuator to the interface with the satellite.
- The K band rotary joint and the actuator are specific Sener developments.

#### CHARACTERISTICS:

- **Mass:** 10.5 kg.
  - **Power:** 6.5 W per moving axis (steer).
  - **Pointing precision:**  $\pm 0.005^\circ$  in open loop.
  - **Speeds:** 0.3°/s per axis.
  - **Radio frequency (RF):**
    - Insertion Loss (K band/X band): < 1.2 dB / 1.5 dB
    - Return Loss (K band/X band): > 18 dB / > 16.5 dB
    - Radio-frequency power handling (K band/X band): min. 100 W / min. 20 W
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