MTG. Scan Assembly (SCA)

SENER AEROSPACE & DEFENSE / SPACE / SPAIN

MTG. SCAN ASSEMBLY (SCA)

Cliente: ESA

País: Spain

The MTG mission (Meteosat Third Generation) is made up of six satellites installed on two different platforms, MTG-I and MTG-S which, in turn have two key instruments: on the one hand, the Flexible Combined Imager (FCI) and, on the other hand, the InfraRed Sounder (IRS), each one integrated into its respective platform, being their main purpose to carry out complementary observation tasks.

The SCAN ASSEMBLY (SCA) for both, FCI and IRS missions, provides to the six satellites, the means to accurately scan all Earth surface. It is composed of the Scan Mechanism (SCAU) and the Scan Electronics (SCAE) containing the actuator drive electronics, the control, algorithms and the related software and firmware. The sweeping or scanning mechanisms are key elements of the FCI and IRS in terms of optical quality and the accuracy and pointing stability of the M0 mirror in both telescopes. They generate high resolution images through sweeping, thereby eliminating the rotational movement of the satellite (spinning) that currently occurs in previous METEOSAT generation (MSG).

SCAU (Scan Assembly Unit): two axis scan mechanism mounted on flexural pivots that moves the instrument M0 mirror. Provided with:

- Voice coil actuators.
- 25 bits Encoders working in close control loop.
- An attenuation damping system to maintain its performances even being present the disturbances provided by the satellite.
- It operates under hard specifications and even under sun intrusion conditions.
- A motorized releasable launch locking device on SCAU to withstand the launch loads.

Some remarkable figures of the SCAU are:

- Operation range: about +/-5º elevation and +/-10º azimuth.
- Accuracy: some micro-rad.
- Dynamic Pointing Stability: better than 1 micro-rad.
- Thermo-elastic Stability: about 5 micro-rad.
- Mirror size: 350 x 500 mm.
- Optical performance: better than 16 nm WFE.

SCAE (SCan Assembly Electronics): electronic box in charge of controlling the movement of the SCAU using specific control algorithms, monitoring accurately the angular position of each axis and providing 1553 and Spacewire communication capability.