MEDIUM EARTH ORBIT LOCAL USER TERMINAL (MEOLUT)

Satellite communications, earth observation, navigation and positioning and control stations

indracompany.com
**MEOLUT**

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**Description**

The MEOLUT provides the necessary RF elements to receive the Signal-in-Space relayed by the L-band SAR/Galileo and S-band DASS PoC satellites. Four 3 meter antenna and four SAR RF receivers are responsible for transmitting the signal to processing modules. In a second stage, the relevant parameter extraction is being made and both TOA/FOA pairs and the localization information are transmitted through the MEOLUT external interface.

Furthermore, the MEOLUT is equipped with a monitoring and control equipment aimed at supervising its complete functionality and even allowing for remote application.

In order to monitor and control this infrastructure as well as the software modules, the collected information is presented in a user-friendly screen (in a graphical and visual way), using a hierarchical multi-window that gives successive levels of detail in the information.

**Main features**

- Be robust to SAR band existent interferers
- Compute Time and Frequency of Arrival of the received SAR signals
- Command and monitor the relevant MEOLUT sub-systems
- Calculate visibility and satellite tracking plans for both DASS and SAR/Galileo constellations, thus optimizing the end achieved performance
- Be robust to wind gusts
- Upgradeable to support networking through the exchange of relevant information between interconnected MEOLUTs to enhance performances

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**MEOLUT**, Indra’s solution for the reception of distress alerts, relayed by the L-band SAR/Galileo, S-band DASS/GPS satellites, recovering the beacon message and locating the person in distress.
The MEOLUT is part of the MEOSAR System of COSPAS-SARSAT System.

A MEOSAR System will provide considerable benefits to the Global SAR Service, enhancing the benefits from both previous systems. The Space Segment of the MEOSAR system is composed of the constellations: SAR/Galileo, DASS/GPS and SAR/Glonass.

The SAR/Galileo System is based on a number of Galileo satellites equipped with SAR payloads that relay distress beacon signals back to the Earth. SAR/Galileo System is composed of the Ground Segment of the Cospas-Sarsat System and the Ground and Space Segment of the SAR/Galileo System.

### Main Applications

- Receive the SAR Signal-In-Space for both L-band (SAR/Galileo) and S-band (DASS PoC)
- Detect and locate MEOSAR distress events
- Deliver distress information to Cospas-Sarsat in order to activate the rescue operations

### Main performances

#### Parameter estimation performances:
- TOA estimation accuracy: 1.1 μs (1 sigma) wrt. UTC
- FOA estimation accuracy: 0.1 Hz (1 sigma)

#### Detection/demodulation performances (based on operational needs):
- Short-term: message recovered with no error in < 5 min (99% prob.)
- Long-term: message recovered with no error in < 30 min (99.8% prob.)
- BER: < 5·10^-5 within 5 min

#### Localization performances (based on operational needs):
- Independent 2D time-to-fix: < 10 min
- Independent 3D time-to-fix: < 20 min
- Independent location accuracy: < 5 km (95% confidence level)
- Tracking: up to 4 MEOSAR SVs at elevation angles > 5°
- Scheduling: selection of 4 satellites from up to 15 within view
- Capacity: < 5 simultaneously emitting beacons
- Coverage area: 3000 km
- Availability: 99%

### Implementation requirements:

#### Front End:
- LHCP and RHCP polarisation
- G/T: 4-db/K above 10° in L-band and 9-db/K above 10° in S-band.

#### Scalability:
- Simultaneous beacon messages (up to 5), tracked SVs (up to 12), polarisations (LHCP, RHCP), constellations (DASS, SAR/Glonass)...

### Site/environmental requirements:

#### Clear horizon:
- No obstacles above 5°, no RF obstacles within 100 m of antenna
- In-band interference: < -211 dB(W/m²) (wideband), < -168 dB(W/m²) (narrowband)

#### Outdoors equipment:
- Temperature: -10°C to +40°C (-20°C to +50°C without damage)
- Humidity: < 95% (< 100% without damage)
- Wind speed: < 100 km/h < 150 km/h without damage)
- Rain: < 50 mm/< 120 mm/h without damage)

#### Indoors equipment:
- Temperature: +20°C ± 2°C, humidity < 70%
- Storage: temperature +10°C to +30°C, humidity < 95% (non-condensing)
Indra reserves the right to modify these specifications without prior notice.