Indra Espacio S.A.

Main areas:
- Project management
- System engineering
- Product and technology
- Customer support

Membership:
- GALILEO sistemas y servicios S.L.
- HISDESAT servicios estratégicos S.A.
- Eurospace member
- Proespacio member
- EARSC member

Main benefits and features:
- Extensive experience in the management of large international projects
- System engineering task force with a large experience in complex system design and analysis activities
- Product design experts in a wide field areas
- Customer partnership, care and full support
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Indra Espacio provides high quality engineering services and products in all the areas related to satellite ground segment systems and components:
• Satellite communications
• Spacecraft control
• Remote sensing
• Satellite navigation

Indra Espacio long-range strategy is to remain one of the leading companies in the world in ground products and systems for space activities, supporting the final customer during the lifetime of the system.

Our engineering capabilities allow us to provide a wide range of projects from specific R & D products, small or medium site engineering projects to large and complex turn key projects.

Indra optimal solutions are based on combining system engineering expertise, with the capability of integrating state-of-the-art COTS equipment with new Indra customer specific developments in many different areas (RF, software, electromechanical...).

Our products constantly benefit from improvements stemming from own and customer needs. They are tailored to specific customer constraints and features. The tight cooperation and partnership with our customers is a permanent source of enhancements.

More than 25 years experience developing solutions for satellite ground systems and components
Introduction
Indra espacio is a leading company in the area of satellite ground systems and components. Our mission is to provide high-quality engineering services and products in all areas related to satellite ground segment systems and components. We have more than 25 years of experience in project management, system engineering, system design, analysis and development, system integration, verification and validation tests, product assurance, and turn-key projects.

Indra Espacio’s main areas of expertise include:
- Project management
- System engineering
- Product engineering
- Customer support

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Main benefits and features

- Complete systems on demand
- Turn-key solutions in the following areas:
  - Relevant programmes either as subcontractor or as prime contractor.
  - Experience in providing turn key solutions, with relevant managed projects
  - Complete ground control segments
  - Spacecraft control systems:
    - Galileo ULS Element
    - SMOS X-Band Acquisition Station (XBAS)
    - Theos TT&C Station
    - HISPASAT (H1A/1B/1C/1D/1E) Ground Control Segment
    - VIL-4 station upgrade for SMART-1 mission
  - Main benefits and features
    - System qualification
    - System implementation
    - System design
  - From complex ground segment architectures...
• HISPASAT (H1A/1B/1C/1D/1E) Ground Control Segment (Maspalomas (Fucino) and TMS-1 (Redu) Antennas)
• VIL-4 station upgrade for SMART-1 mission
• EUMETSAT Polar Station Facility
• SPAINSAT/XT AR Control Segment
• ARTEMIS/Olympus/EUTELSAT; TMS-4/5 Ground Control Segment

Key performance indicators
- System engineering capabilities
  - SPAINSAT carrier and payload management systems
  - Several ground stations M & C
  - HISPASAT and AMZ ground control segments
  - Indra develops SW in accordance with the most demanding standards. For instance

Main benefits and features
- System architects and engineers...

Projects
- Documentation management for system engineering and control
- System management for end-to-end spacecraft ground segment systems
- Indra’s two years experience on ground control segment systems
or main contractor, providing customized and relevant programmes either as subcontractor.

Since 1987, this department is involved in spacecraft ground control systems.

The department of Indra Espacio has a large number of projects in its portfolio.

The EUMETSAT Polar Station Facility.

The EUMETSAT BRGS TT&C Station at

Ka-Band TT&C stations for ARTEMIS; PTS Bench

GALILEO MEOLUT Stations

Ariane-5 S/X Tracking Station

THEOS TT&C Station

GIOVE-A/B IOT System

EGNOS Navigation Landing Earth Stations

SPAINSAT/XT AR Carrier Monitoring System

• Advanced IOT System (AIOTS)...

• Advanced System (AES)...

• Modelling and simulation

• System architecting and trade-offs

• Requirements analysis, development and implementation management

• System testing and validation

• Report writing and presentations

• Ground station systems

• Customer technical support and interface

• Technical problem solving and troubleshooting

• Interface management

• Participation in the development of TT&C and telemetry systems...

• European technology harmonization on TT&C and telemetry systems...

• Participation in space systems engineering activities...

• Development and testing of ground software systems...

• Management of critical software modules...

• GALILEO ULS, TTCF, test tools and low risk COTS products...

• Indra develops SW in accordance with the most demanding standards. For instance...
Main references

- AMAZONAS (AMZ-1 and AMZ-2) IOT
- HISPASAT (H1A/1B/1C/1D) IOT Bench
- HISPASAT (H1A/1B/1C/1D/1E) Ground
- EUMETSAT BRGS TT&C Station at (Fucino) and TMS-1 (Redu)
- HELIOS Satellite Image Receiving Stations
- Advanced IOT System (AIOTS)...
- GALILEO MEOLUT Stations
- THEOS TT&C Station
- Vitrociset VEGA launcher
- GIOVE-A/B IOT System
- EGNOS Navigation Landing Earth Stations
- Electrical ground support equipment
- Earth observation ground stations
- TT & C ground stations
- systems, civil works, operations definition…).

Complete ground control segments

Spacecraft control systems:

- Maspalomas for SPOT Satellite
- M & C systems
- Indra develops SW in accordance with the
- ISV. Once approved and being used in
- most demanding standards. For instance
- S.A. has a remarkable know-how in:
- to the simplest earth station, Indra Espacio
- From complex ground segment architectures
- control, IOT and observation stations
- Management capabilities
- Spacecraft underpinnings:
- Guaranteed delivery times
- ENSURE REACH OF ALL IOT STATIONS
- • Earth observation ground stations
- • TT & C ground stations
- • Systems engineering capabilities
- • System design
- • System engineering
- • System concept development
- • System implementation
- • System analysis and design
- • System architecting and trade-offs
- • System verification and test
- • System engineering
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Introduction

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