

# Space for all

GMV is a private engineering and technology group, being one of the strongest players in the Space domain. It is a premier provider worldwide for space organizations and agencies, and the major satellite manufacturers and operators.

With 40 years of experience and more than 900 satellites carrying its technology, GMV can safely claim to be a technological partner of cast-iron dependability, capable of meeting the most stringent needs under the strictest quality standards. We have achieved CMMI Level 5 certification, covering the whole range of activities and services within the Space sector.

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## KEY AREAS

### Ground Segment

- Provision of turn-key ground segments.
- Satellite control centers.
- Flight dynamics systems.
- Mission planning systems.
- Ground stations monitoring and control.
- Security facilities and cybersecurity.
- Payload configuration, planning and optimization systems for telecommunications missions.
- Science-mission operations centers.
- Data processing systems.

### Navigation

- Satellite navigation engineering and algorithms.
- Major systems of processing and generation of Global Navigation Satellite System signals.
- Precise positioning solutions and augmentation systems.

### SSA/SST/STM/SDA

- COTS SW for SST data processing (*Ecosstm*).
- Passive RF network of sensors (*Focusar*).
- Commercial services with Ops Centre (*Focusoc*).

### Flight Segment

- System-engineering and mission analysis.
- Guidance, Navigation and Control (GNC) systems.
- Autonomy and robotics.
- Satellite and mission simulators.
- Ground validation and testbeds.
- Onboard software and independent validation.
- Data simulators and processors for earth observation and astronomy instruments.
- Avionics for launchers.
- Protection of Space Assets (PSA).
- In-orbit servicing (IOS): capture, refueling.

### Data Processing

- Instrument processors for earth-observation and science missions.
- Quality-control and calibration systems.
- Space applications, solutions and services.
- (e.g. security, climate change, agriculture, forestry, maritime...).

### Operational support for space missions



**6<sup>th</sup>**

European Space  
Industrial Group



**900 +**  
Spacecraft use  
GMV Technology



**1,800 +**  
Space  
Engineers

## KEY CUSTOMERS

### ESA

After 40 years of ongoing collaboration, GMV has become one of the main suppliers of the European Space Agency (ESA) and has provided its specialist services and solutions for almost all of ESA's missions at any of the operating centers (ESOC, ESTEC, ESRIN, EAC, ESAC, ECSAT).

### EUTELSAT

EUTELSAT is currently the world's third biggest satellite operator. GMV is the main supplier for the ground segment of EUTELSAT's satellite fleet, including the satellite control center, flight dynamics systems, ground stations monitoring and control, network and access security and payload management and configuration.

### EUMETSAT

GMV is one of the main suppliers of control centers, flight dynamics systems, mission-planning systems, payload data processing and support services of EUMETSAT. Good examples are its contributions to the missions EPS, Sentinel 3, Jason, MTG and EPS SG; in the latter two GMV is the prime contractor of the complete ground control segment, including the ground stations in the case of the EPS-SG mission.

### NASA

The US space agency has selected GMV's mission planning products for the LRO (Lunar Reconnaissance Orbiter) moon mission and its flight dynamic systems for NOAA's GOES-R mission. GMV also provides mission satellite control technology for the Landsat and TDRS missions.

### CNES

GMV is a framework-contract supplier of CNES's systems and services, including the development and maintenance of its space surveillance and traffic management and orbital dynamics systems, including the next-generation SIRIUS system. GMV is also providing mission-analysis and operational-engineering expertise plus onboard software development capabilities.

### DLR

GMV is one of DLR GSOC and DLR GfR's main suppliers of engineering and operational services for the Galileo and Columbus missions, as well as of the German Space Situational Awareness Centre (GSSAC).

### EUSPA

GMV is a relevant contractor of the European Union's flagship space programs, EGNOS/GALILEO, EUSST, GovSatCom and Copernicus.

## **GALILEO/EGNOS/LEO PNT**

GMV is one of the companies that has made the biggest contribution to the development and deployment of the European Union's flagship space program. In EGNOS and Galileo GMV is responsible for the processing core and fundamental, performance-affecting and system-enabling components in the ground structure. Equally noteworthy is GMV's leadership in a large number of important centers and services. In addition, GMV is priming the Galileo Ground Control System (GCS) development and maintenance, having direct responsibility on the critical systems like Spacecraft & Constellation Control, Key Management and Flight Dynamics Facilities.

Finally GMV is leading the ESA LEO PNT project aiming to define the future navigation systems.

## **TELECOMMUNICATIONS**

In 2010 GMV became the world's number one independent supplier of ground control systems for commercial telecommunications satellite operators, holding onto this ranking ever since. Over 250 satellites of almost 40 main operators and agencies on the five continents are being operated today with GMV's control systems, not counting the OneWeb mega-constellation whose command & control element is provided by GMV.

GMV is also providing solutions for the operations of next generation digital SATCOM payloads, spanning software defined ones, including regenerative on-board processors and supporting increased on-board autonomy towards cognitive radio. GMV is developing the ground segment for the SpainSat NG program, Europe's most advanced satellites in the field of defence and secure communications.



GMV plays a key role  
in the development  
and deployment of the  
European Satellite  
Navigation System Galileo

## **CONSTELLATIONS**

Beyond Galileo, GMV is a key provider of major ground subsystems for satellite constellations, such as OneWeb (mission control), Globalstar (flight dynamics), O3b (flight dynamics) and Telesat (mission planning, flight dynamics and mission control).

## **COPERNICUS**

GMV is making a notable contribution to the European Union's Copernicus program, including satellite simulators, instrument processors, control centers, orbital dynamics, mission planning systems and precise orbit-determination services.

## **SPACE TRAFFIC MANAGEMENT**

European leader in STM: main contributor to ESA's Space Safety; leader of key EUSST tasks in Spain (S3TOC development & operations), Germany (GSSAC Mission System & EUSST catalogue) and France (EUSST architecture analyses); commercial CA services and support to German & Spanish military SST Ops Centers.

## **TECHNOLOGY**

GMV is playing a crucial role in technology-developing space missions such as PROBA-3 (formation flying), Hera (asteroid impact), and OPS-SAT. GMV is leading the robotics European Union's PERASPERA R&D program.

## **SPACE EXPLORATION**

GMV is playing a standout role in the major technological challenges represented by space-exploration missions such as Exomars and Moon missions.

## **EARTH OBSERVATION SATELLITES**

System developed for main Earth Observation missions: ESA's operational Earth Explorer and EUMETSAT operational satellites and development of new missions (Instrument data processors and prototypes, Flight Dynamics, Mission Planning, Mission Control, simulators, mission analysis). Key participation in the development of National Spanish EO Program missions. As well as commercial Earth Observation missions, like development of Ground segment for data processing, data processors, mission planning and customer services for future MBZ-SAT of UAE, the most advanced satellite in the region in the field of high-resolution satellite images.

## **NEW SPACE**

In the exciting New Space landscape, GMV is developing a ground segment concept for thousand-strong small satellites constellations. GMV has acquired the Alén Space startup, small satellites manufacturers including on-board computers and software defined radios. We have provided the full avionics for the PLD Space technology MIURA 1 micro-launcher.