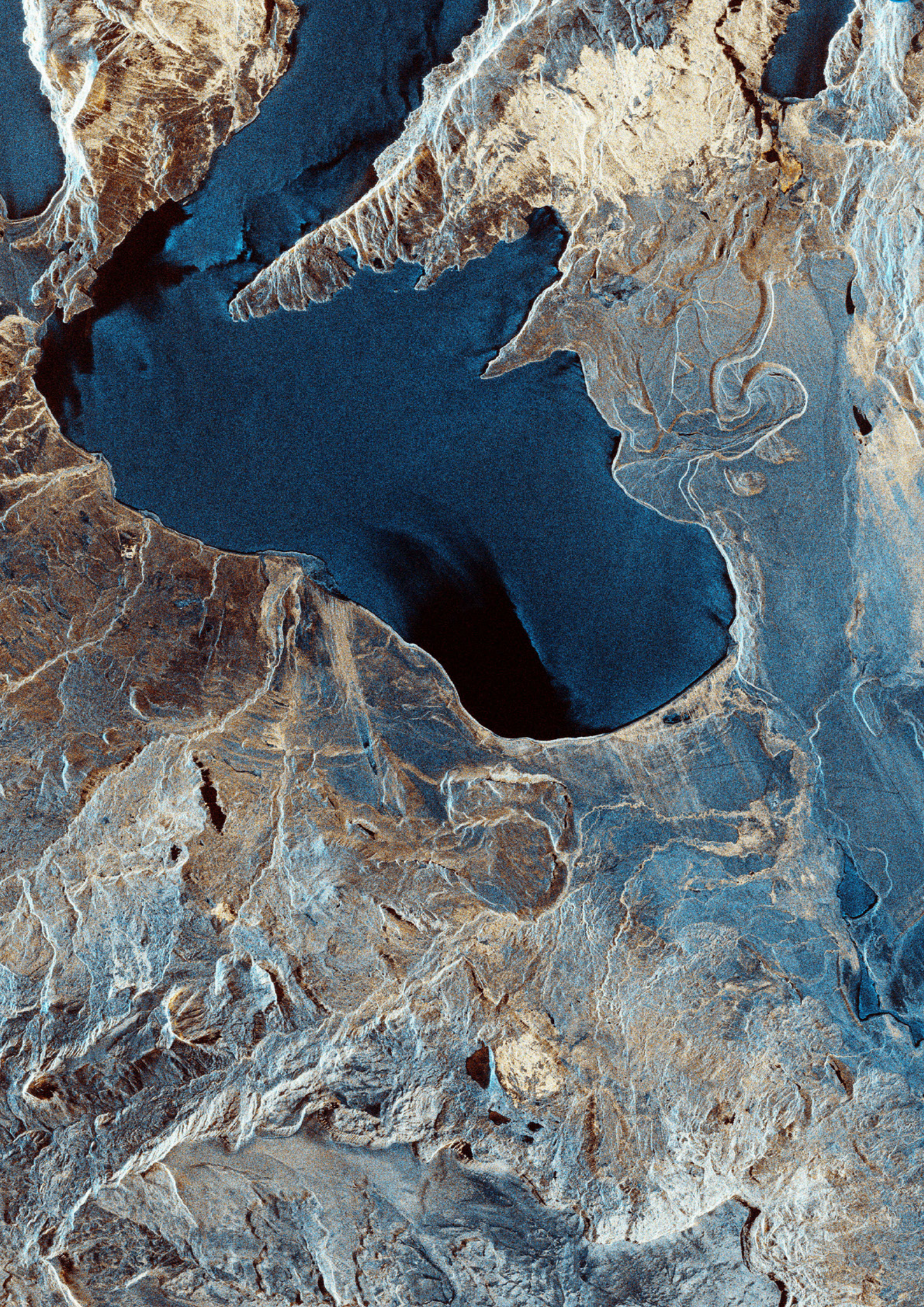




Argentine Space Company
STRATEGIC SPACE & SATELLITE CAPABILITIES





VENG's transformation towards the **New Space** paradigm represents the culmination of years of development and consolidation of capabilities in Argentina's aerospace sector. As a company, we have channeled our experience in satellite engineering, mission operations, and complex systems development to create a portfolio of products and services that embraces the fundamental principles of this new era: accessibility, efficiency, and commercialization.

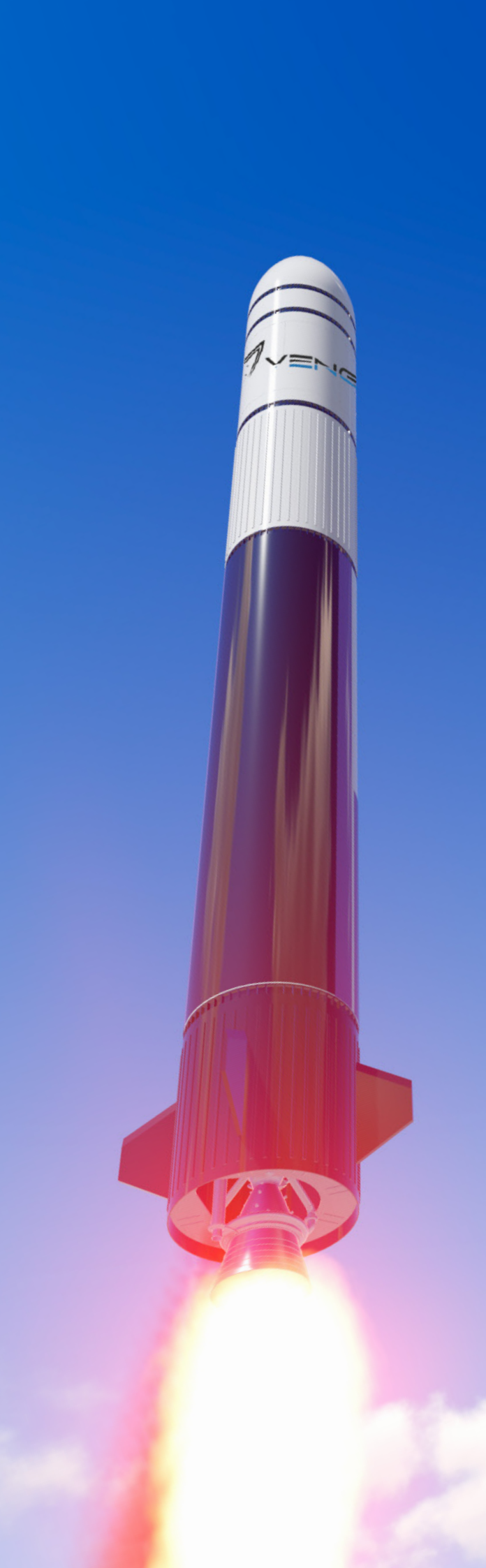
VENG has developed distinctive capabilities that set us apart in the New Space ecosystem: from the design and manufacturing of high-performance microsatellites to the comprehensive operation of complex space missions. Our mastery of cutting-edge technologies such as attitude control systems, satellite signal processing, distributed architectures, and geospatial analysis platforms, combined with our experience in scientific and commercial payload integration, grants us a unique transformation potential. These consolidated technical capabilities constitute the foundation upon which we are redefining cost, time, and accessibility standards in the space sector.

This evolution positions VENG as a catalyst for the transformation of the space sector in Argentina and Latin America. We convert advanced technological developments into accessible commercial products, eliminating the traditional barriers that limited access to space capabilities.

At VENG, we believe that space should not be the exclusive domain of a few, but rather a tool for economic and social development accessible to a new generation of actors. Our transition towards **New Space** lays the groundwork for Argentina to collaborate as a regional space power, building from national talent and innovation the future of a truly spacefaring Argentina.



Roberto Oscar Yasielski
President, VENG S.A.



INDEX

#1 WE ARE VENG

We are VENG	7
Access to Space Trajectory	8
Satellite Missions Trajectory	9
Our Locations	10

#2 ACCESS TO SPACE

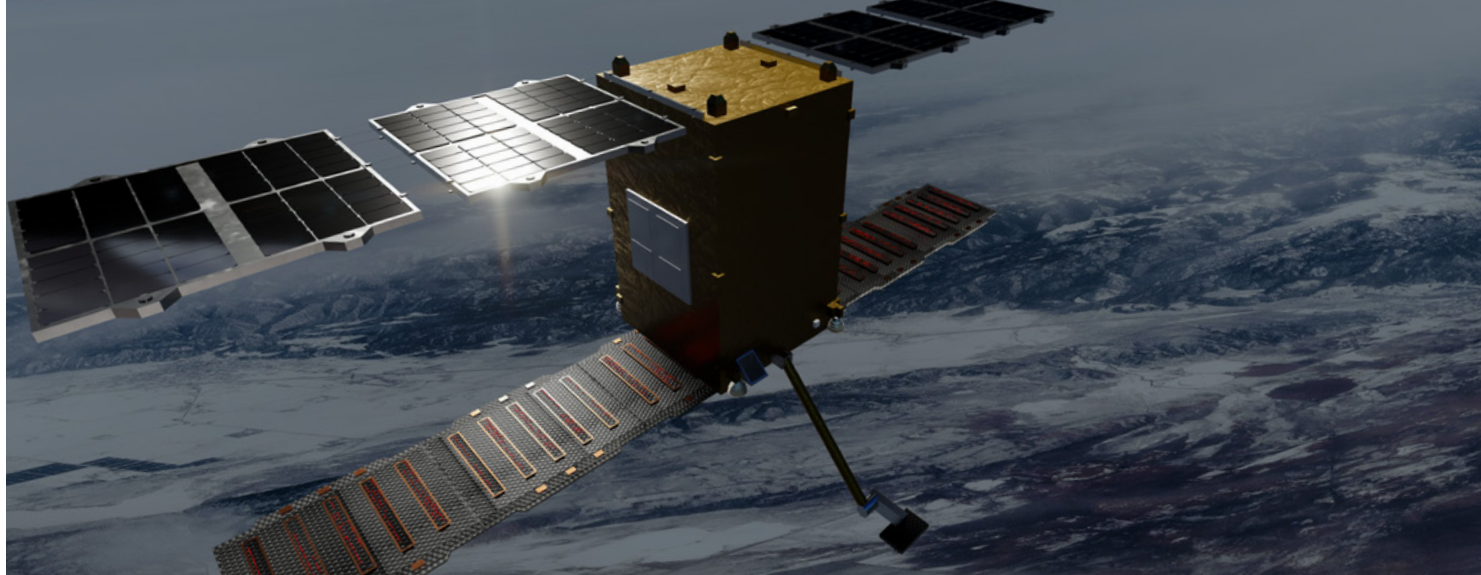
Launch Services	14
Spaceport Services	15
Propulsion Services	16
Friction Stir Welded Tanks	18

#3 SATELLITE PROJECTS

Satellite Constellation for Critical assets and operations Monitoring	22
--	----

#4 GROUND STATIONS

SAOCOM Mission Control Center Operation ..	26
Ground Stations	28
Ground Segment Services	30
Antenna Specs	32



#5 SATELLITE INFORMATION

L-Band SAR Technology	38
Acquisition Modes	40
Soil Moisture Ambient Map	42
SAR Interferometric Stacks	43
Rapid Monitoring option	44
Customer oriented office	45

#6 PRODUCTS

On Board Computer	48
Fatigue Meter	52
SVD Digital Video System	54
RTV - Enhanced Flight Termination Receiver	54
S-Band Patch Antenna	55
Dual-Antenna and Dual-Frequency GNSS Receiver	55
Antartix OBC Computer	56
Avionics Battery	56
Engine Controller	57
Test bench version	57
S-Band Data Transmitter	57

#7 SERVICES

Facilities	60
Electronic Integration and Testing services	62
Mechanical Integration and Testing Services ...	64
Specialty Coatings services	72
RF Testing Facility	75
Integration and Thermal Testing Services	76
Antenna Design and Testing Services	82
Electromagnetic Compatibility services	86
Precision Metrology Services	90
Mechanical Engineering	94
Electronics Engineering	96
Surface-Mount Technology (SMT)	98
Special Machining	101
Special Welding:	104
Friction Stir Welding Center (FSWC)	104
Development Of Additive Manufacturing Products	106
Carbon Fiber Windings	107
Special Heat Treatments	108
Harness	110



We are VENG

WE ARE VENG

We are an **Argentine space technology company specializing in the development, integration, and operation of complex technological systems.** As a key partner in the National Space Program, we operate across the entire value chain of the sector, contributing to the strengthening of sovereign capabilities, industrial development, and the country's international projection.

In this context of technological advances, at **VENG** we bring together advanced engineering, systems integration, specialized infrastructure, and operational capabilities to **offer complete solutions for missions, enabling governments, agencies, and organizations** to translate technological advances into tangible results with measurable economic and operational impact.

+18
years of
experience

+16
years of
ground stations operations

+380
staff of collaborators

ACCESS TO SPACE TRAJECTORY

2007

2008

2011

2014

2017

2023

2024

2025

PROBE ROCKET
VS-30

TRONADOR 1B

TRONADOR 4000

VEX1A

VEX1B

VEX5A

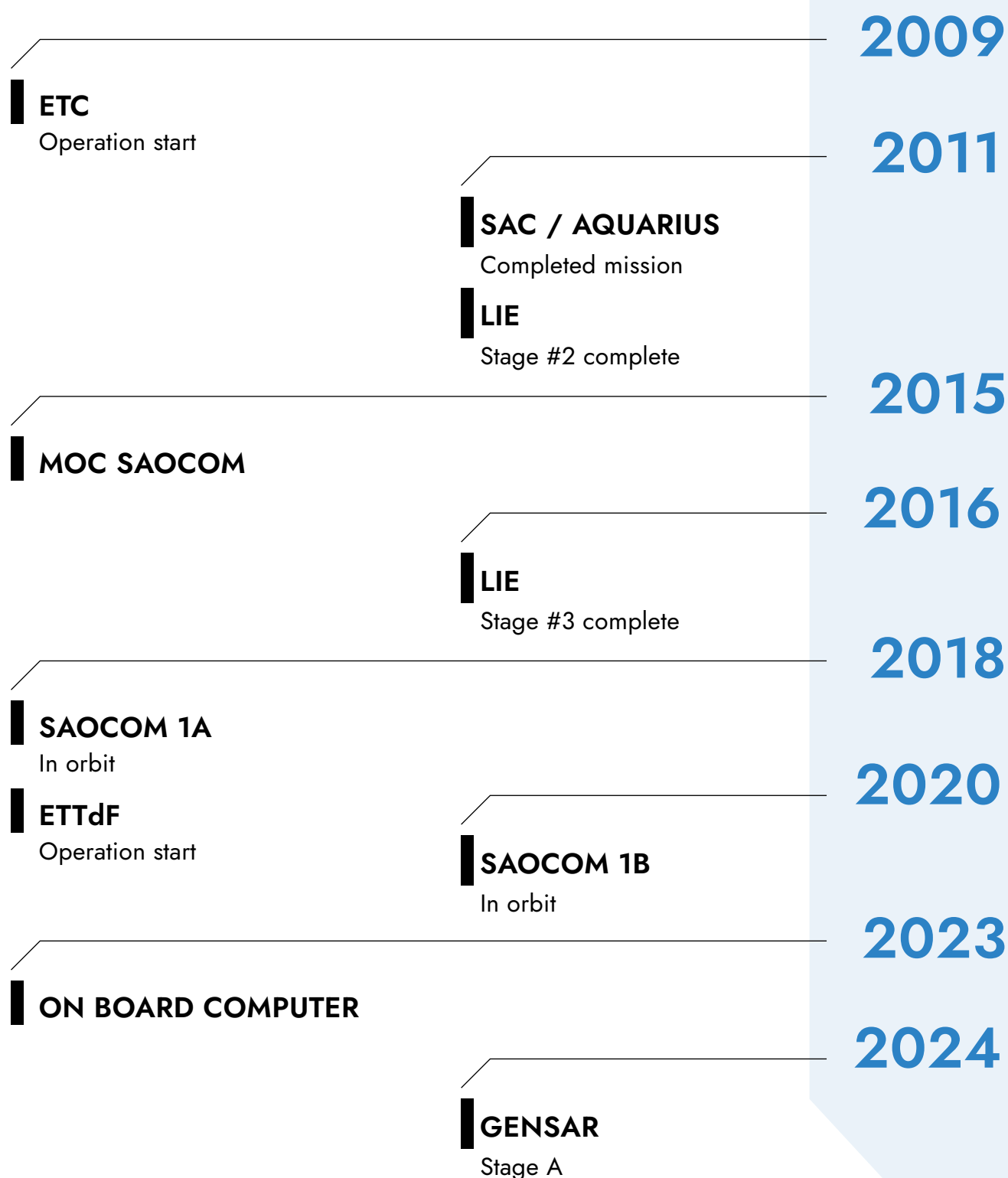
RS-2 ENGINE

1ST FRICTION-
WELDED TANK

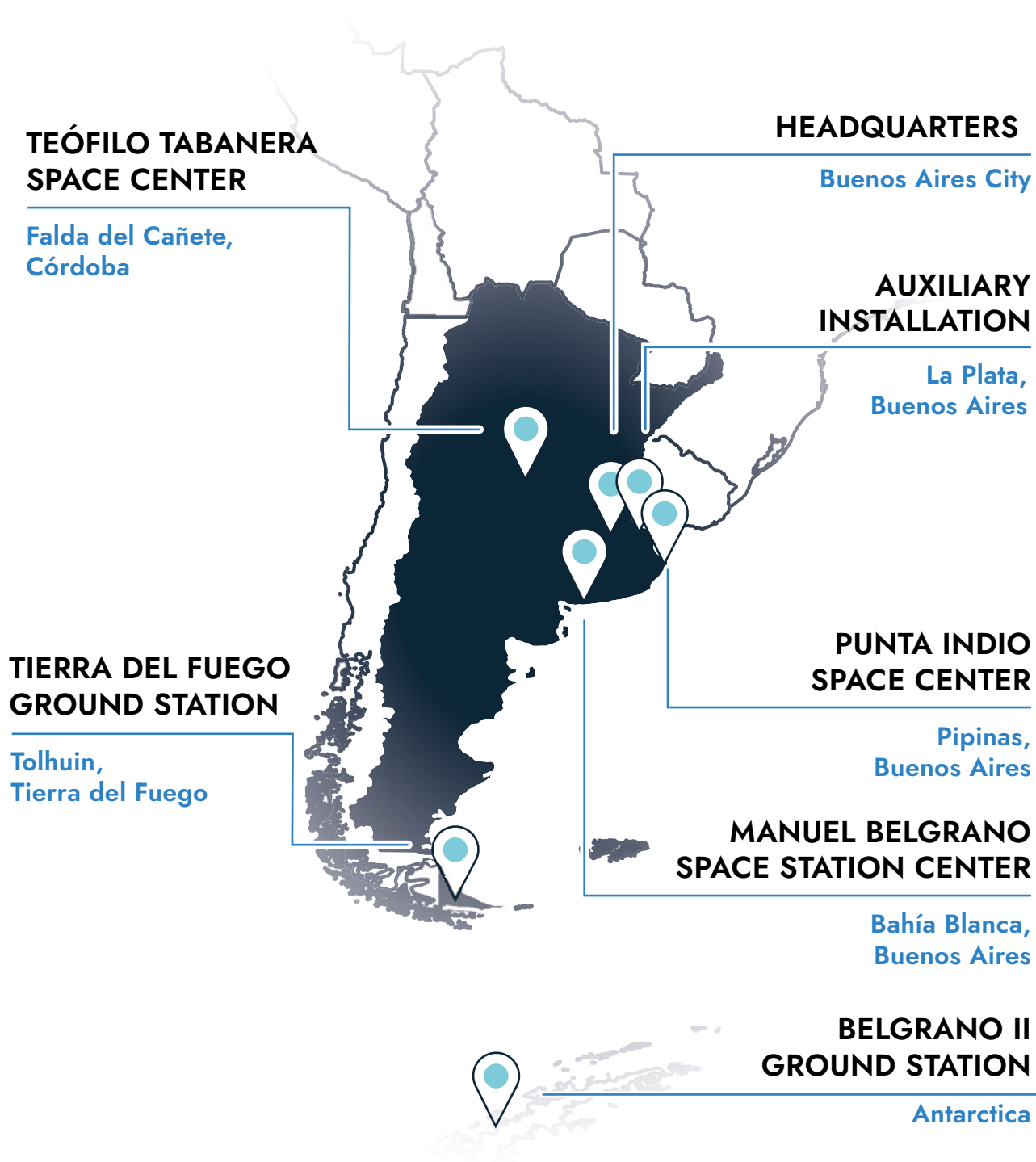
RS-3A ENGINE

MT-B ENGINE

SATELLITE MISSIONS TRAJECTORY



OUR LOCATIONS



Teófilo Tabanera Space Center



- Satellite Mission Control Center
- Ground Station operation Córdoba
- Engineering
- Metal-mechanical fabrications
- Heat treatment
- Image Processing
- Manufacturing, Integration, and Testing

Manuel Belgrano Space Station Center



- Launching Base
- Engineering

Ground Station of Tierra del Fuego



- Operation of ground stations

Punta Indio Space Center



- Engineering
- Production of aerospace vessels
- Metal-mechanical fabrications
- Engine Testing

Villa Elisa Auxiliary Installation



- Electronic engineering specialized in RF
- Electronic Laboratory

Buenos Aires City Headquarters



- General Administration
- Engineering

#2 //

ACCESS TO SPACE



A full-page background image of a clear blue sky with several wispy white clouds scattered across it. The clouds are more concentrated in the upper left and lower right areas, leaving a large clear blue space in the center.

We are developing a satellite launcher to provide launch services **from Argentina to the world**, thus joining the small group of countries that master these capabilities and are part of the global expansion of commercial space activity.

LAUNCH SERVICES

At VENG we develop and operate reliable, accurate and affordable launch solutions. Our 2 stage, liquid propulsion launch vehicle, with proprietary technology, allows efficient injection of payloads up to 150 kg into SSO orbits. With optimized infrastructure and competitive costs, we guarantee successful missions with high availability and accuracy.

The launcher

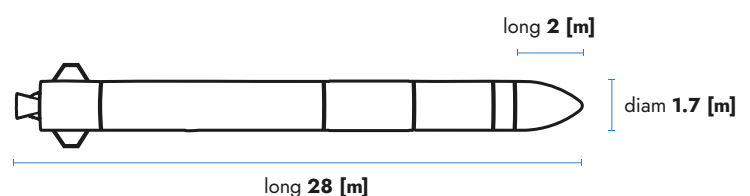
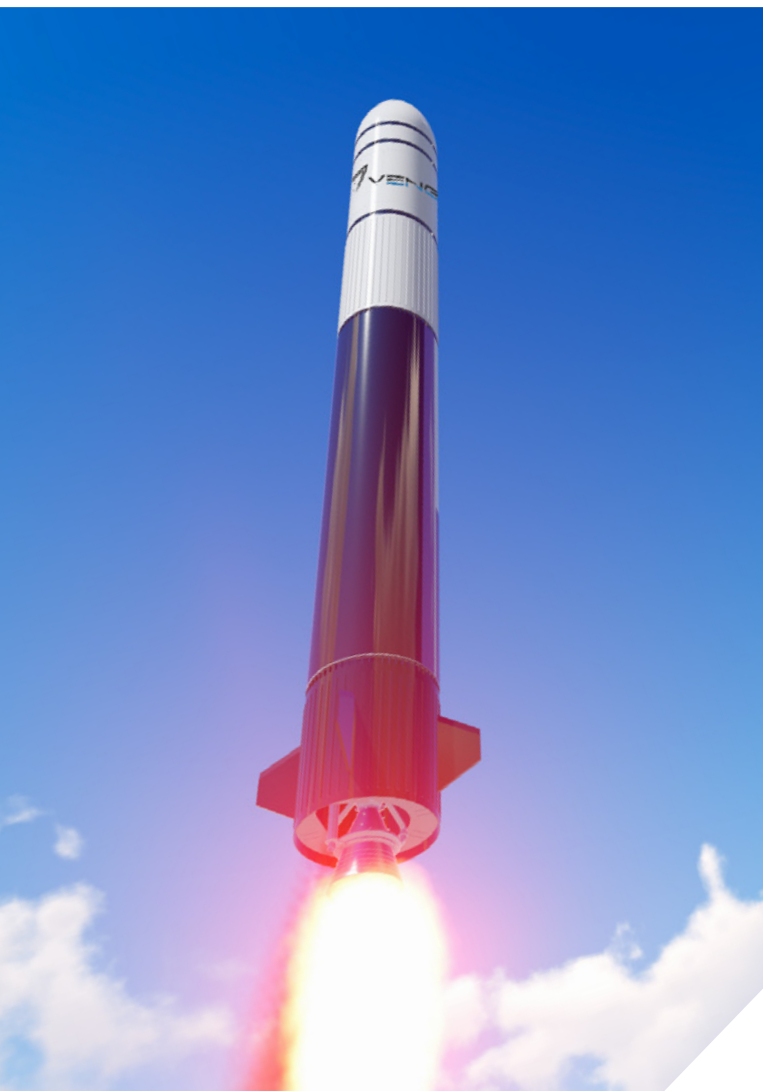
2 stages LOX-KER propulsion

Friction Stir Welded aluminum core-stage

CFRP upper stage

Proprietary propulsion systems

- **150kg payload @ 550km SSO - Direct injection**
- **High injection and deployment accuracy**
 - | Inclination < +/- 0.15°
 - | Apogee < 15Km
 - | Attitude < 5°
- **High availability**
 - | Launcher manufacturing and operations
 - | Proprietary spaceports
- **Competitive price:** Target **15.000 \$/kg**
- **Competitive capacities**
 - | Ground tracking with proprietary fixed antennas
 - | Strategically located spaceports for efficient operations to SSO



SPACEPORT SERVICES

We have the Manuel Belgrano Spaceport, strategically located to guarantee safe and efficient launch operations. Our infrastructure allows direct access to SSO orbits, optimized ground tracking and a low-risk launch environment. We provide integral solutions for space missions with high standards of reliability and performance.

Efficient and low-risk operations

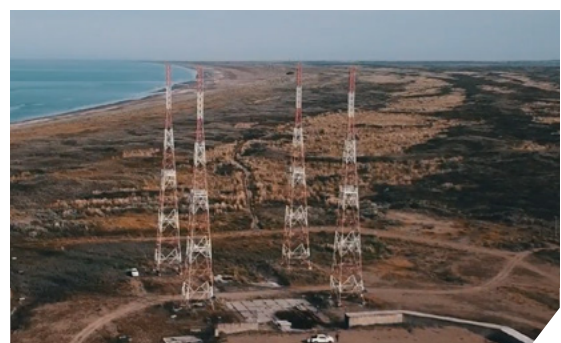
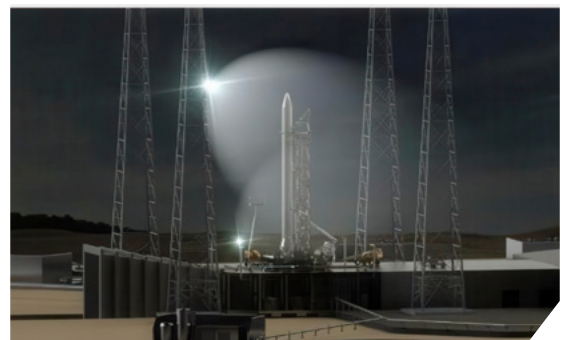
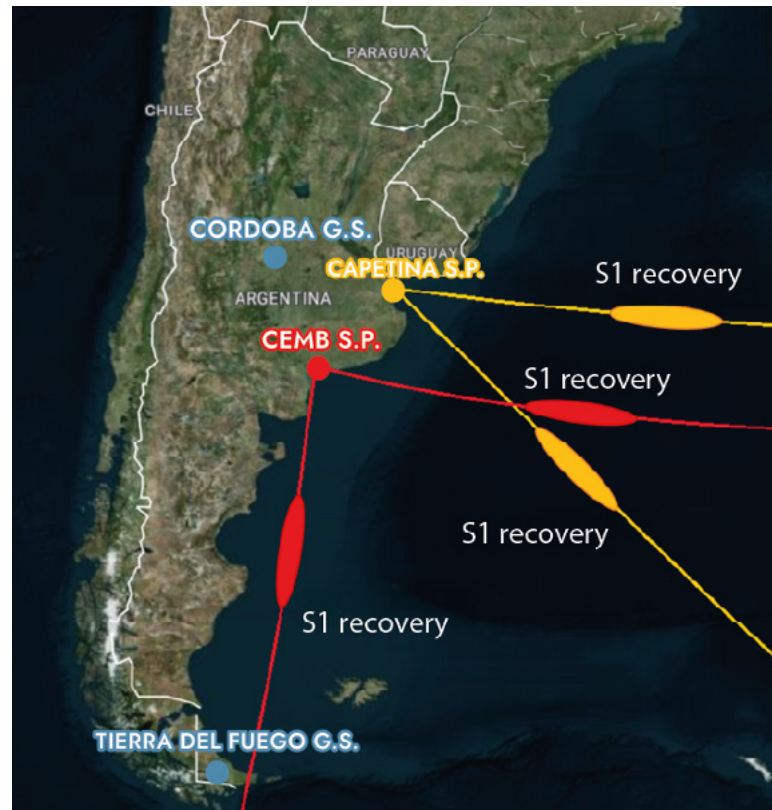
- Direct launch to SSO
- No dogleg
- Sub-orbital flight over Argentinian sea
- Polygon security

Nearby seaport, airport & services

High availability

- Proprietary launch pad and support facilities

Low-barriers-to-entry launch operations



Manuel Belgrano Spaceport
Bahía Blanca, Buenos Aires, Argentina

PROPULSION SERVICES

Since our beginnings, one of our main areas of technological development has been the area of liquid propulsion, mainly oriented to the development of propellants for launch vehicles and also small propellants for attitude control of launchers and potential use in the satellite industry.

Regarding small thrusters, we have the heritage of having participated in the development of prototypes of the order of 1, 5 N thrust, monopropellant, at labo-

ratory level, having verified the development capacity of this type of thrusters, being able to adapt to the needs of satellite customers and the space industry in general.

The characteristics of the prototype developed in R+D+i mode are shown below.



IN QUALIFICATION

MT-B ENGINE 1ST & 2ND STAGE

The MT-B is a bipropellant liquid rocket engine with a single regeneratively cooled thrust chamber, powered by an open-cycle gas generator. It was developed as the propulsion system for the second stage of the Tronador TII-250 vehicle. The thrust chamber was manufactured using a combination of additive manufacturing and electroforming technologies.

Use	2nd stage (optimal) or 1st stage cluster
Vacuum Thrust	4280 Kgf
Propellants	LOX/KER
Specific vacuum thrust	305 s
Specific impulse at SL	260 s
Feed system	Gas generator cycle

Launch vehicle engines

Regarding higher thrust liquid propellants, we have an extensive experience of more than a decade in the development of Hydrazine/Nitric Acid and LOx/Kerosene engines for launcher prototypes, having as main milestones the design, manufacturing, testing and integration in the TI, T4000, VEx 1A, Vex1B and VEx5A launcher prototypes.

As a reference, the VEx5A first stage engine is shown, the largest propellant developed to date.

Today we are leading as prime contractor in the design of the thrusters for the Tronador II launcher series, taking care of the complete propulsion value cycle: from the definition of requirements, through design, simulation, manufacturing, testing, qualification and integration in the final vehicle.

This experience allows us to adapt to any propulsion solution required by the customer, both for launchers, satellites and spacecraft in general.

MCA3 ENGINE 1ST STAGE IN DEVELOPMENT



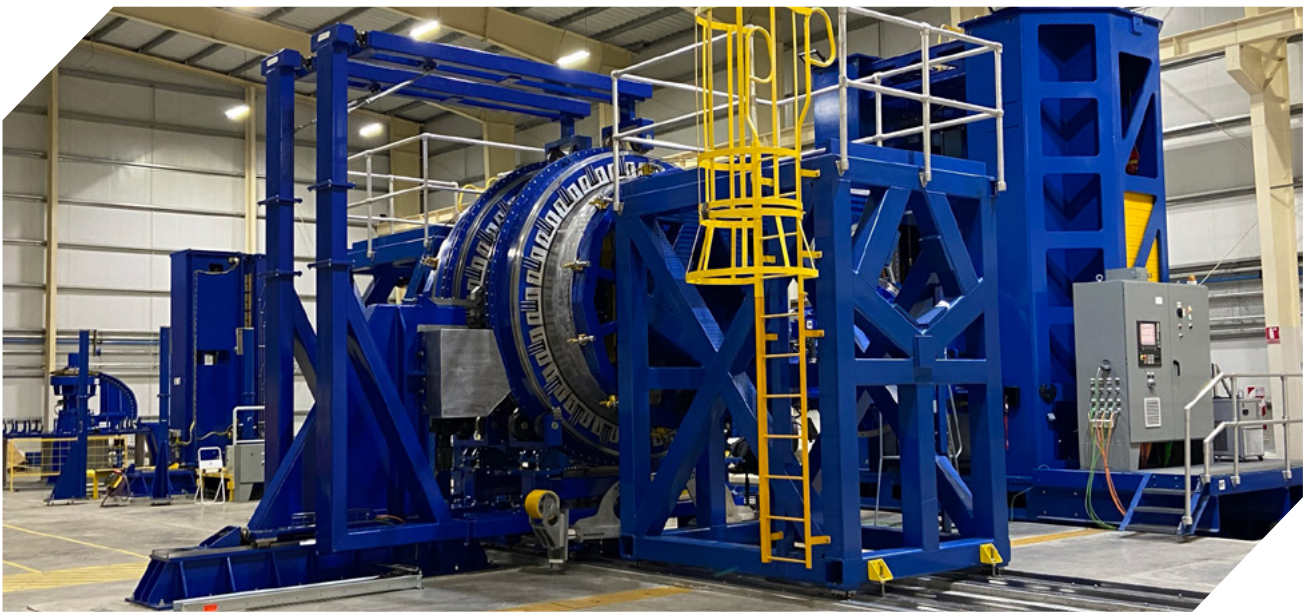
Use	E1 of TII-250 (x3)
Thrust to adapted nozzle	35750 Kgf
Propellants	LOX/RP1
Specific impulse at SL	262 S
Feed system	Gas generator cycle

MES3K ENGINE 2ND STAGE



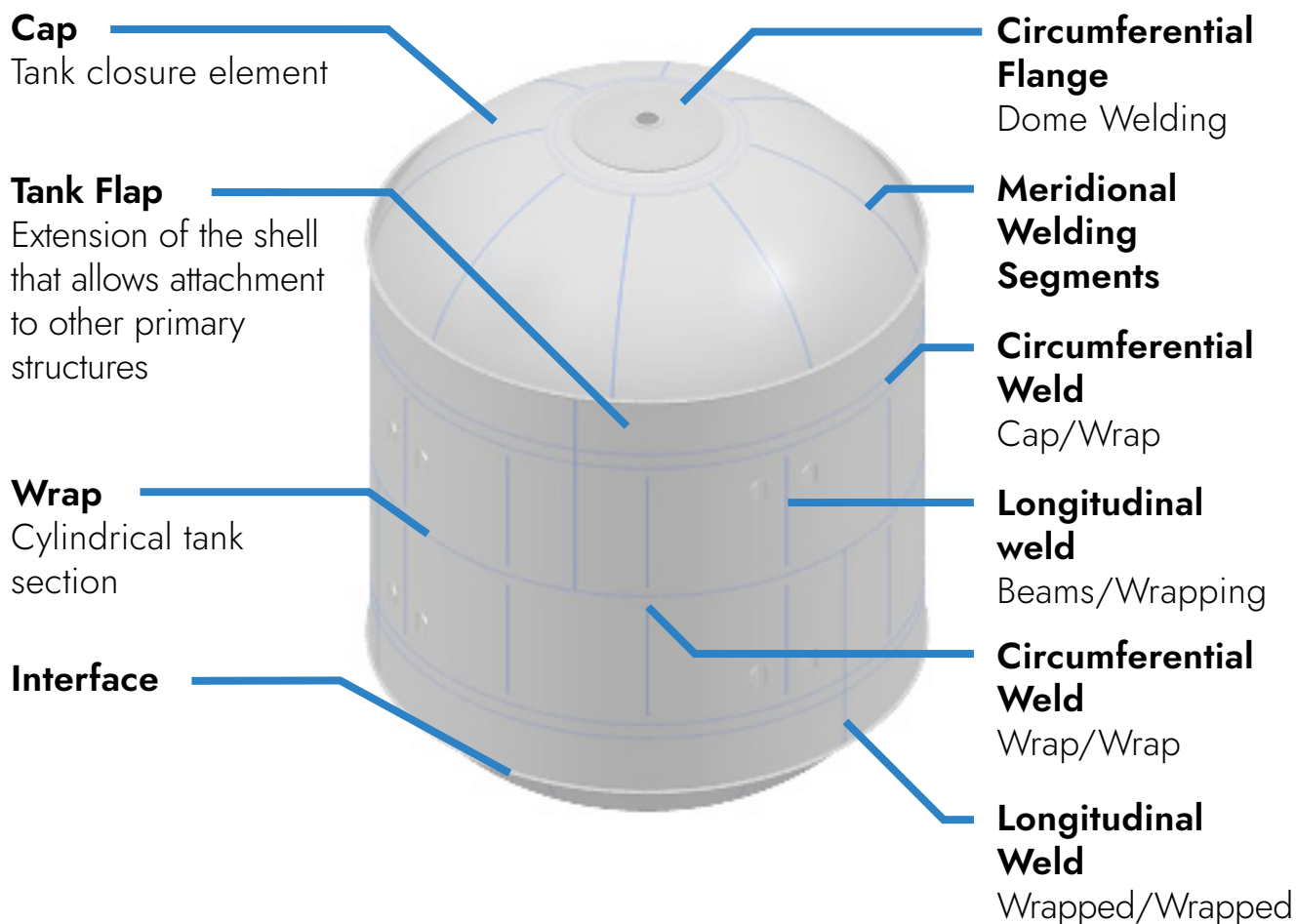
Use	E1 of VEX1 (x1)E2 of VEX5A (x1)E2 of TII-250 (x1)
Thrust at SL	2975 Kgf
Propellants	MMH/NTO
Specific impulse at SL	317 S
Feed system	Pressurized

FRICTION STIR WELDED TANKS



We have the capability to develop pressurized and non-pressurized structures through the **Friction Stir Welding** (FSW) manufacturing technique. As a last experience, we carried out the design, fabrication and integration of a prototype **first stage tank of the Tronador II-250 launcher**. It is 3.5 meters long, 2.5 meters in diameter and 3.2 millimeters thick and was welded by the **friction-stir welding method** under international standards of the American Welding Society, a technology of unprecedented use in the country. All its components are made of 2219 aluminum for space use. These tanks will simultaneously serve as **fuselage and propellant storage tanks**.

MANUFACTURER	Nova Tech Engineering Inc.
GEOMETRY	Longitudinal, Orbital, dome weldings
WELDING JOINTS	Butt, Lap
MATERIALS	Aluminum Alloys, others..
THICKNESS	2,4 – 13 mm (Aluminum Alloy)
WELDING LENGTH	2600 mm (max)
TOOL RPM	5 rpm – 2000 rpm
MAXIMUM FORCE	53400 N
MAXIMUM TORQUE	450 Nm

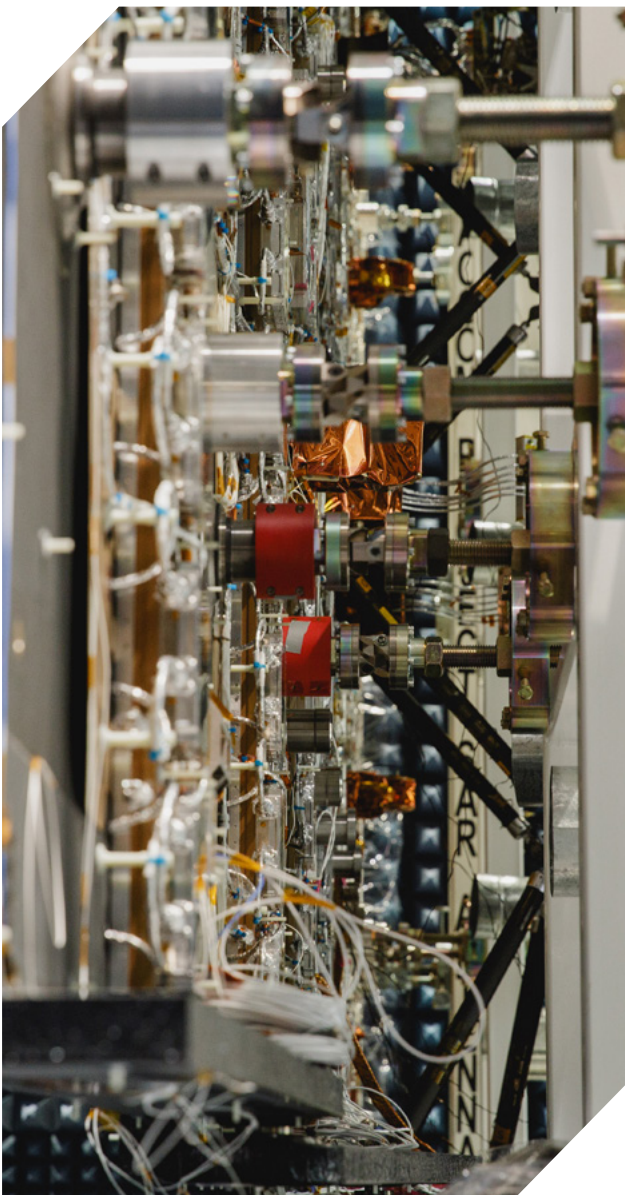


#3 //

SATELLITE PROJECTS



We are specialists in remote sensing through SAR radar instruments. We have the capability to develop, integrate, test and qualify complex satellite subsystems and systems within the most demanding space industry standards. When it comes to satellite missions we can work autonomously with satellites up to 250kg mass, and together with our network of partners we can push the limits of our capabilities.



Our history in development, integration and testing for the satellite industry

- Technological Demonstrated “TDP” SAC-D Mission, under INVAP and NASA requirements
- D-OBC satellite payload computer
- Ad-hoc antennas for SAOCOM and SABIA-Mar satellite missions
- Various flight and ground electronics subsystems for SAOCOM, SABIA-Mar and other earth observation and communications satellite missions
- **Current development** of new small-SAR constellations, focusing on hi-resolution monitoring and interferometric capabilities.

SATELLITE CONSTELLATION FOR CRITICAL ASSETS AND OPERATIONS MONITORING

We are developing an advanced constellation of X-band SAR satellites. It re-defines infrastructure monitoring with a scalable satellite system that offers centimeter-level resolution, ensuring image capture for greater target identification accuracy and proactive decision-making at a disruptive price.

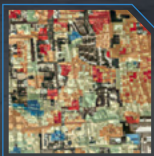
The system concentrates all available resources on offering an effective and specific solution. This strategy allows the constellation to reduce costs and operate at disruptive market values, ensuring accurate and accessible surveillance of critical infrastructure around the world.

Satellite Information Strategic Uses



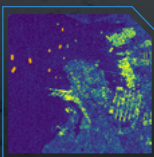
1

Target detection and operational intelligence



2

Infrastructure monitoring



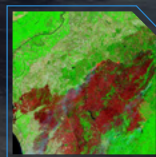
3

Support for land and maritime operations



4

Border control



5

Emergency management



6

Sea, forests, extensive activities:
Mining & Oil & Gas

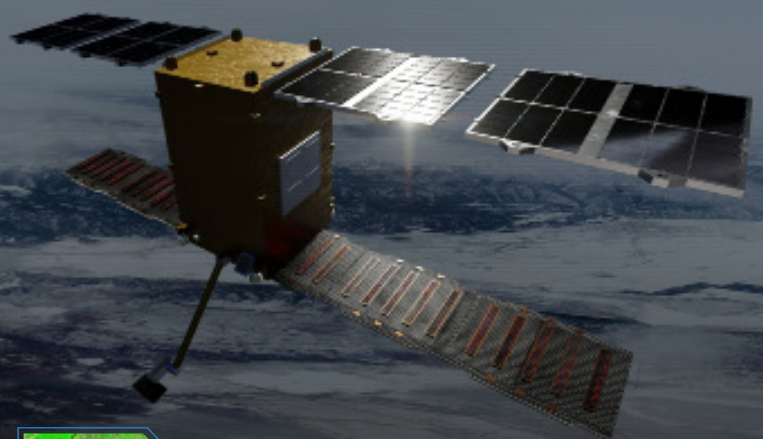
Management and protection of natural assets



7

Illegal fishing

Control and management of waterways and



Technical Characteristics



Constellation of microsatellites
for Earth Observation

Objective > 3 satellites
Global Coverage



X-band SAR Technology

Cloudy / Day / Night
World-class State-of-the-Art



Optimized Design

"New Space" Cost Solution



High revisit frequency

Sub-daily



Rapid response

Delivery time < 1 hour



High resolution

Sub-meter / High definition demand



Operational capacity

Operational training and acquisition of space engineering & technology capabilities for the end user



Technological control
of the system

*Rapid response in the short term,
technological sovereignty in the long term*



Data Analytics Platform

Control and flexibility
Access to other satellites

Operational Capability

Coverage Area: Complete coverage of the Southern Cone.

Ground Segment: A backbone of ground stations, integrable with new capabilities to be developed.

Command, Control, and Analysis Center: On-Premise infrastructure.

Product Delivery Time: L1 < 1 hour.

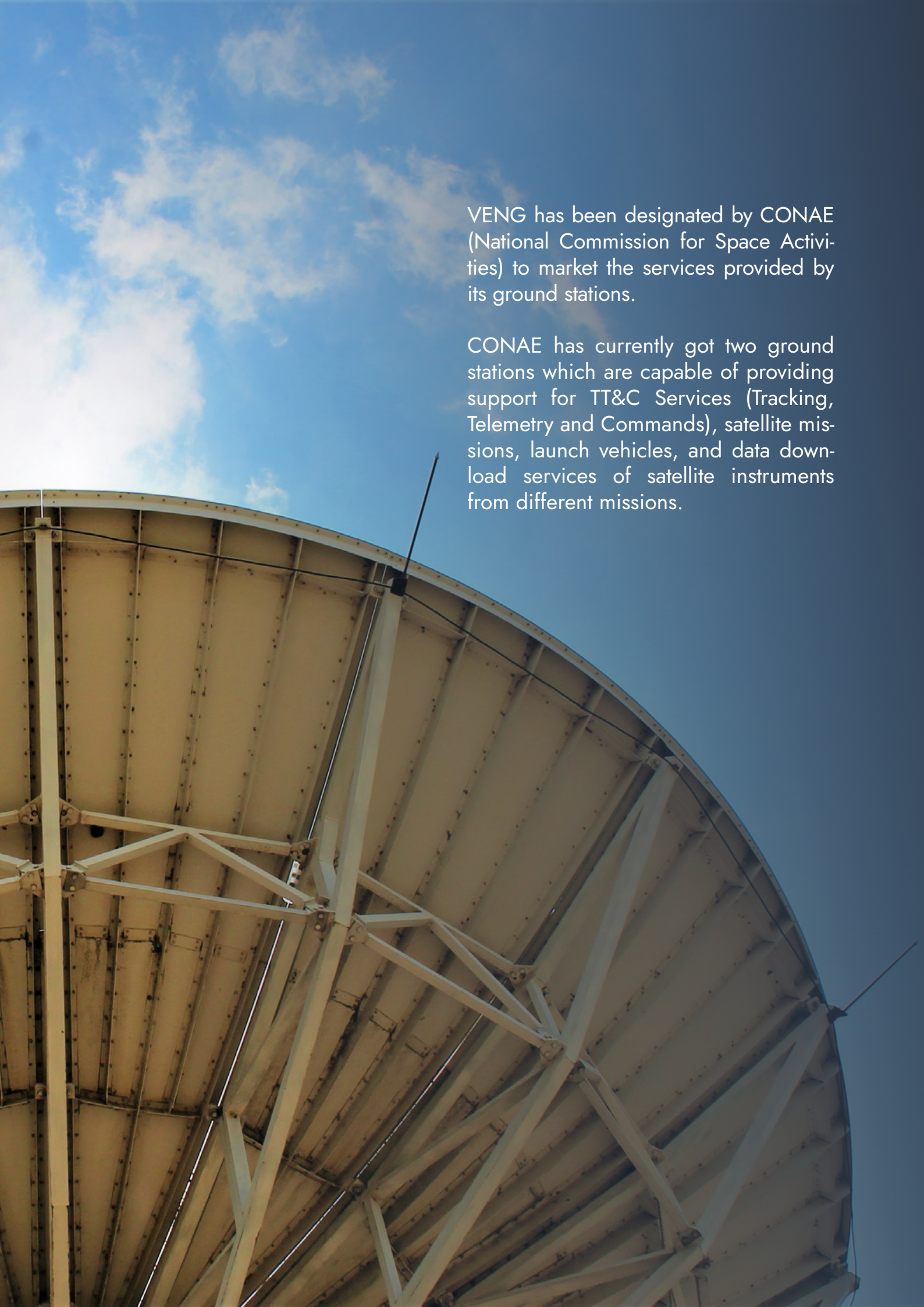
Constellation Revisit Time: Sub-daily.



#4 //

GROUND SEGMENT



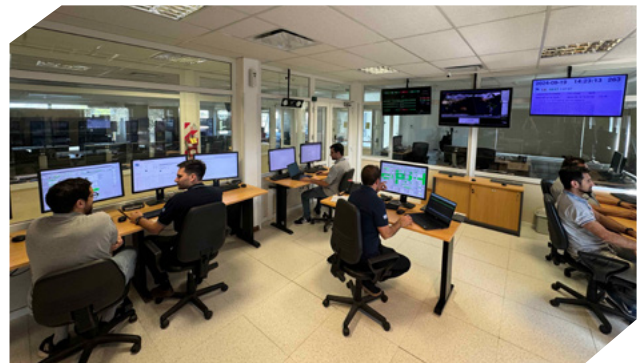
A low-angle, upward-looking photograph of a large, yellow-painted satellite dish antenna. The dish's surface is composed of many rectangular panels held together by a network of metal struts and bolts. The structure is set against a bright blue sky with scattered white clouds. The perspective makes the dish appear to curve upwards towards the top of the frame.

VENG has been designated by CONAE (National Commission for Space Activities) to market the services provided by its ground stations.

CONAE has currently got two ground stations which are capable of providing support for TT&C Services (Tracking, Telemetry and Commands), satellite missions, launch vehicles, and data download services of satellite instruments from different missions.

SAOCOM MISSION CONTROL CENTER OPERATION

Welcome to the operational epicenter of the SAOCOM constellation. Since the launch of SAOCOM 1A in 2018, we lead the Mission Center with a specialized focus on Semi-Automated Operations, critical satellite maneuvers and maintenance. Our dedication translates into 24/7 uninterrupted attention and monitoring, backed by a highly available and redundant datacenter.



34

daily revisit passes

SEMI AUTOMATED

operation of processes

24/7

support and monitoring
for operating platforms

+1000

products generated
and published
automatically per day

CRITICAL OPERATION

of maneuvers and
maintenance tasks
on satellites

HIGH AVAILABILITY

and redundancy
data center

We are the vital connection between space and earth, facilitating efficient and reliable operation of the SAOCOM constellation. In every critical maneuver, maintenance and data generation, we are committed to excellence, driving the positive impact of space technology on everyday life and scientific advances.



We have specialized professionals who ensure the accurate execution of more than 1000 satellite scenes generated and published automatically on a daily basis. This capability not only demonstrates our expertise, but also our essential contribution to the field, providing crucial data for various applications.



GROUND STATIONS

Since 2009 we have participated in the operations of CONAE's ground stations.

Due to the central location of the Cordoba Ground Station with respect to the country's territory, it is possible to regularly acquire satellite data from all of

Argentina, Chile, Bolivia, Paraguay and Uruguay and a very important area of Peru and Brazil.

The Tierra del Fuego Earth Station is the southernmost in the continent with TT&C and data download capabilities.

Strategically located in the southern hemisphere

CORDOBA

Latitude: 31° 31' 29,9501"S (-31,524986)
Longitude: 64° 27' 45,8611"W (-64,462739)
Altitude: 730 m

TIERRA DEL FUEGO

Latitude: 54° 30' 37.6151"S (-54.510448)
Longitude: 67° 06' 56.0343"W (-67.115565)
Altitude: 146 m146

ANTARCTICA

BELGRANO II - COMING SOON



Cordoba Ground Station

The Cordoba Earth Station (ETC) is located at the Teofilo Tabanera Space Center (CETT) and carries out the activities of reception, processing, publication and storage of satellite information generated by different Earth observation satellites.

› Antenna dimensions

3.6; 5.4 (mobile); 7.3 and 13.5 m

› Services

- TT&C in S-Band
- X-Band data download



Tierra del Fuego Ground Station

The Tierra del Fuego Earth Station is located near the town of Tolhuin and is equipped with two parabolic reflector satellite antenna systems.

› Antenna dimensions

7.3 and 13.5 meters

› Services

- TT&C in S-Band
- X-Band and Ka-Band data downloads

GROUND SEGMENT SERVICES

Fully automatic. Transfer from one satellite to another in **30 seconds**. Product catalog available **one hour** after satellite pass. Over **100 gigabytes** of data downloaded per day.



**HIGH POWER
AVAILABLE**



**HIGH AVAILABILITY
OF CONNECTIVITY**



**7X24 SERVICE
ALL YEAR ROUND**

Features of our services



**SITES PREPARED
FOR GROUND
STATIONS**



SAFE AREAS



**ON-SITE TECHNICAL
SUPPORT**



**BACKED-UP
ELECTRICAL SYSTEM**



**HIGH SPEED
INTERNET**

Ground Station Engineering

Engineering for the development of ground segment infrastructure. Development of specific software for mission control centers and Ground Stations.



KNOW HOW



**INTERNET
SERVICE**



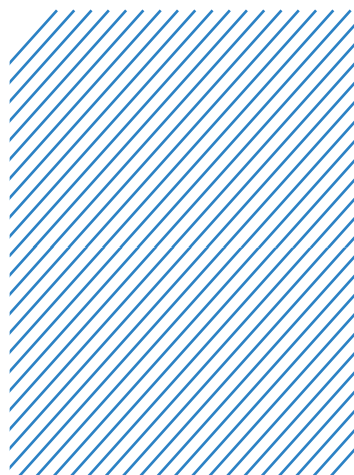
SERVERS



MAINTENANCE



ANTENNA SPECS



S-BAND

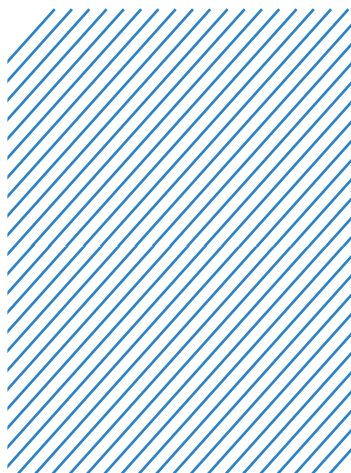
S-BAND

Location	Cordoba	Cordoba
Dish Diameter	3,6m	5,4m
Brand	Scientific Atlanta	ViaSat
Tx Frequency Range	2025 MHz to 2120 MHz	2025 MHz to 2120 MHz
Rx Frequency Range	2200 MHz to 2300 MHz	2200 MHz to 2300 MHz
Antenna Gain	35,36 dBi	37,4 dBi
G/T	12,43 dB/°K min	16,0 dB/°K a RHCP
Tx Polarization	Lineal	RHCP/LHCP selectable
Rx Polarization	RHCP/LHCP simultaneous	RHCP/LHCP simultaneous
Tx Power	2W to 200W selectable	2W to 200W selectable
EIRP	54,5 dBW @ 200W	58 dBW @ 200W
Beamwidth	2,7° Nominal	0,82° Nominal

X-BAND

X-BAND

Rx Frequency Range	8025 MHz to 8400 MHz	8025 MHz to 8400 MHz
Antenna Gain	46 dBi	51,8 dBi
G/T	25,68 dB/°K	31 dB/°K
Rx Polarization	RHCP	RHCP/LHCP simultaneous
Beamwidth	0,7° Nominal	0,4° Nominal

**S-BAND****S-BAND****Location**

Cordoba

Cordoba

Dish Diameter

7,3m

13m

Brand

Datron

Datron

Tx Frequency Range

2025 MHz to 2120 MHz

2025 MHz to 2120 MHz

Rx Frequency Range

2200 MHz to 2400 MHz

2200 MHz to 2400 MHz

Antenna Gain

41,05 dBi

45 dBi

G/T

18,94 dB/°K

24 dB/°K

Tx Polarization

RHCP/LHCP selectable

RHCP/LHCP selectable

Rx Polarization

RHCP/LHCP simultaneous

RHCP/LHCP simultaneous

Tx Power

3,2W a 100W selectable

2W a 200W selectable

EIRP

58,9 dBW to 100W

62 dBW to 200W

Beamwidth

1,3° Nominal

0,8° Nominal

X-BAND**X-BAND****Rx Frequency Range**

8025 MHz to 8400 MHz

8025 MHz to 8400 MHz

Antenna Gain

54,5 dBi

59,3 dBi

G/T

30,87 dB/°K

37,5 dB/°K

Rx Polarization

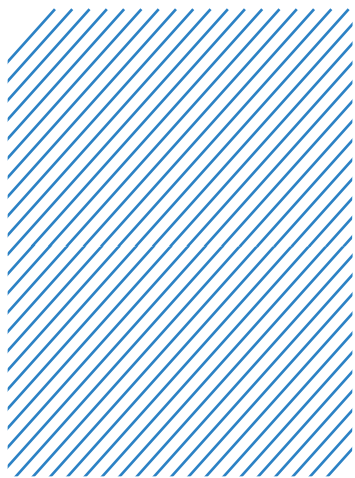
RHCP/LHCP selectable

RHCP/LHCP selectable

Beamwidth

0,3° Nominal

0,19° Nominal



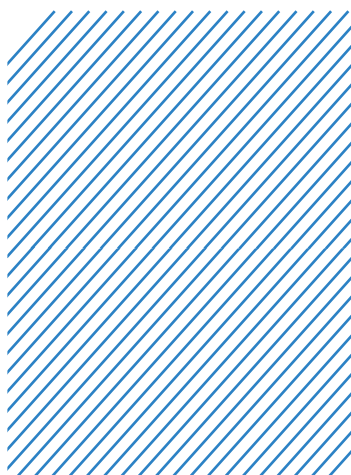
S-BAND

Location	Tierra del Fuego	
Dish Diameter	7,3m	
Brand	ViaSat	
Tx Frequency Range	2025 MHz to 2120 MHz	
Rx Frequency Range	2200 MHz to 2400 MHz	
Antenna Gain	41 dBi	
G/T	18,91 dB/°K	
Tx Polarization	RHCP/LHCP selectable	
Rx Polarization	RHCP/LHCP simultaneous	
Tx Power	3,2W to 200W selectable	
EIRP	58 dBW @ 200W	
Beamwidth	1,2° Nominal	

KA-BAND

X-BAND

Rx Frequency Range	25.5 GHz to 27 GHz	8000 MHz to 8500 MHz
Antenna Gain	59,8 dBi	53.7 dBi
G/T	36,77 dB/°K	32.5 dB/°K
Rx Polarization	RHCP/LHCP simultaneous	RHCP/LHCP simultaneous
Beamwidth	0,1° nominal	0,3° nominal

**S-BAND****S-BAND**

Location	Tierra del Fuego	Antarctica
Dish Diameter	13,56m	6,1m
Brand	ViaSat	ViaSat
Tx Frequency Range	2025 MHz to 2120 MHz	2025 MHz to 2120 MHz
Rx Frequency Range	2200 MHz to 2300 MHz	2200 MHz to 2300 MHz
Antenna Gain	45 dBi	41,7 dBi
G/T	24,56 dB/K°	18,3 dB/°K
Tx Polarization	RHCP/LHCP selectable	RHCP/LHCP selectable
Rx Polarization	RHCP/LHCP simultaneous	RHCP/LHCP simultaneous
Tx Power	2W to 660W selectable	2W a 200W selectable
EIRP	69,2 dBW @ 660W	58,1dBW @ 200W
Beamwidth	0,71° Nominal	1,6° @ 2,2 GHz

X-BAND**X-BAND**

Rx Frequency Range	8025 MHz to 8400 MHz	7800 MHz to 8500 MHz
Antenna Gain	59,5 dBi	52,5 dBi
G/T	38,16 dB/°K	30,66 dB/°K
Rx Polarization	RHCP/LHCP simultaneous	RHCP/LHCP selectable
Beamwidth	0,18° Nominal	0,38° Nominal

#5 //

SATELLITE INFORMATION





We provide products and services of the highest technology using information from the **SAOCOM® satellite constellation** (L-band quadruple polarization synthetic aperture radar).

We provide solutions to governments and industries such as Mining, Oil & Gas, Agriculture, among others, **favoring management based on risk assessment and decision making.**

We offer high availability services **focused 100% on customer needs**, accelerating the process of early adoption for incorporation into business models.

L-BAND SAR TECHNOLOGY

SAOCOM® is a constellation that consists of two quadruple polarization L-band SAR satellites which observe the Earth's surface night and day, regardless of weather conditions.

By working in L Band, the satellites can obtain information by **penetrating the vegetation cover and soil, thus capturing moisture information**. Other applications include ship detection, soil moisture mapping, change detection for the Mining and Oil & Gas industries, and forecasting for wheat spike fusarium, among many others.

REVISIT TIME

8 days (1A + 1B)

BEST RESOLUTION

10 mts

QUAD POLARIZATION STRIPMAP

40 x 74 km $\approx$

TOPSAR

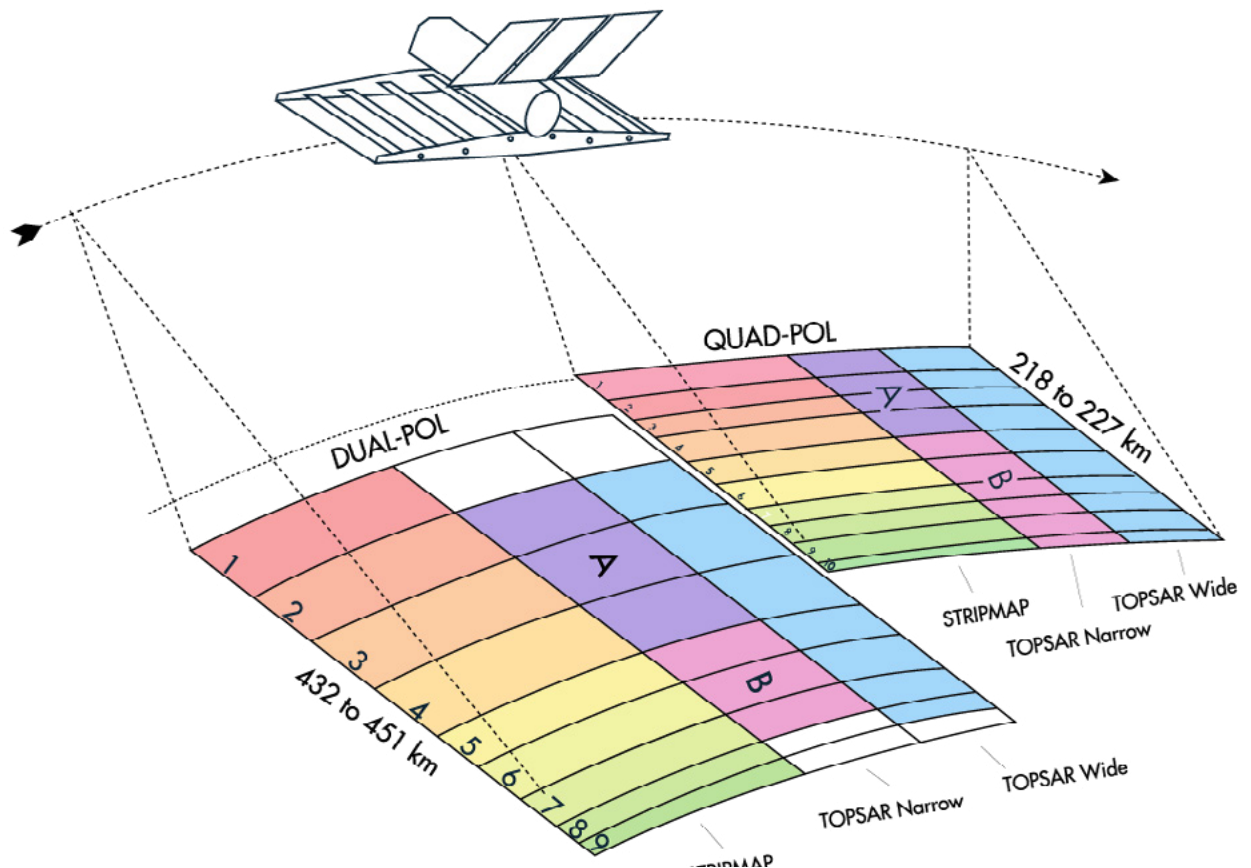
350 x 445 km $\approx$

ANGLE OF VIEW

from 20,7° to 50,2°



ACQUISITION MODES



Strip Map

Simple, Double or Quadruple Polarization

Radar points to a given fixed direction while picks up a continuous band corresponding to narrower scanings and with more space resolution.

TOPSAR Narrow

Simple, Double or Quadruple Polarization

Radar changes its pointing along the trace to pick up several brands, covering a greater scanning width with less space resolution than in the StripMap case.

TOPSAR Wide

Simple, Double or Quadruple (complete) or Compact

Radar changes its pointing along the trace to pick up a greater number of bands, covering a greater scanning width with less space resolution than in TOPSAR Narrow case.

Simple Polarization

HH VV

The system issues and receives in the same linear polarization.

Double Polarization

HH VV VV y VH

The system issues in a linear polarization and receives in two linear polarizations simultaneously.

Quadruple Polarization

HH VV VV and VH

The system issues alternately in both linear polarization and simultaneously receives in them.

Compact Polarization / CL-POL

RIGHT-H and RIGHT-V

LEFT-H and LEFT-V

System transmits a circular polarization (right or left) and receives in two polarizations simultaneously.

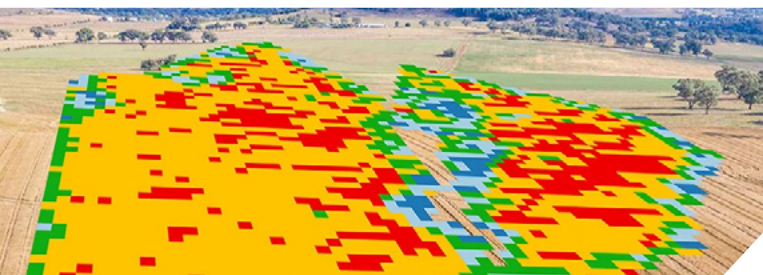
Acquisition Mode	Nominal Resolution (Rng x Az) [m]		Nominal Size of the Scene (Rng x Az) [km]	Polarizations
	Product L1A	Products L1B, L1C y L1D		
STRIPMAP SP	10 x 5	10 x 10	40 x 74	HH o VV
STRIPMAP DP	10 x 5	10 x 10	40 x 74	HH+HV o VV+ VH
STRIPMAP QP	10 x 6	10 x 10	20 x 74	HH+HV+VH+VV
TOPSAR Narrow SP	10 x 30	30 x 30	150 x 222	HH o VV
TOPSAR Narrow DP	10 x 30	30 x 30	150 x 222	HH+HV o VV+ VH
TOPSAR Narrow QP	10 x 50	50 x 50	100 x 222	HH+HV+VH+VV
TOPSAR Wide SP	10 x 50	50 x 50	350 x 445	HH o VV
TOPSAR Wide DP	10 x 50	50 x 50	350 x 445	HH+HV o VV+ VH
TOPSAR Wide QP	10 x 100	100 x 100	220 x 445	HH+HV+VH+VV

SP: Single Polarization // DP: Dual Polarization // QP: Quad Polarization

SOIL MOISTURE AMBIENT MAP

SAR scenes obtained by the SAOCOM constellation allow us to develop multiple georeferenced soil moisture products, which allow for bare soil moisture estimation.

Below you will find a sample from a mining exploitation through heap-leaching.



Benefits: Mining



- It will give you the confidence of having valuable information to prevent tailings dam slope failures.
- It will give you the possibility to avoid losses in your profits due to leaching failures.

PRODUCTS AND SERVICES



**SOIL MOISTURE
AMBIENT MAP**



**RELATIVE SOIL
MOISTURE
AMBIENT MAP**



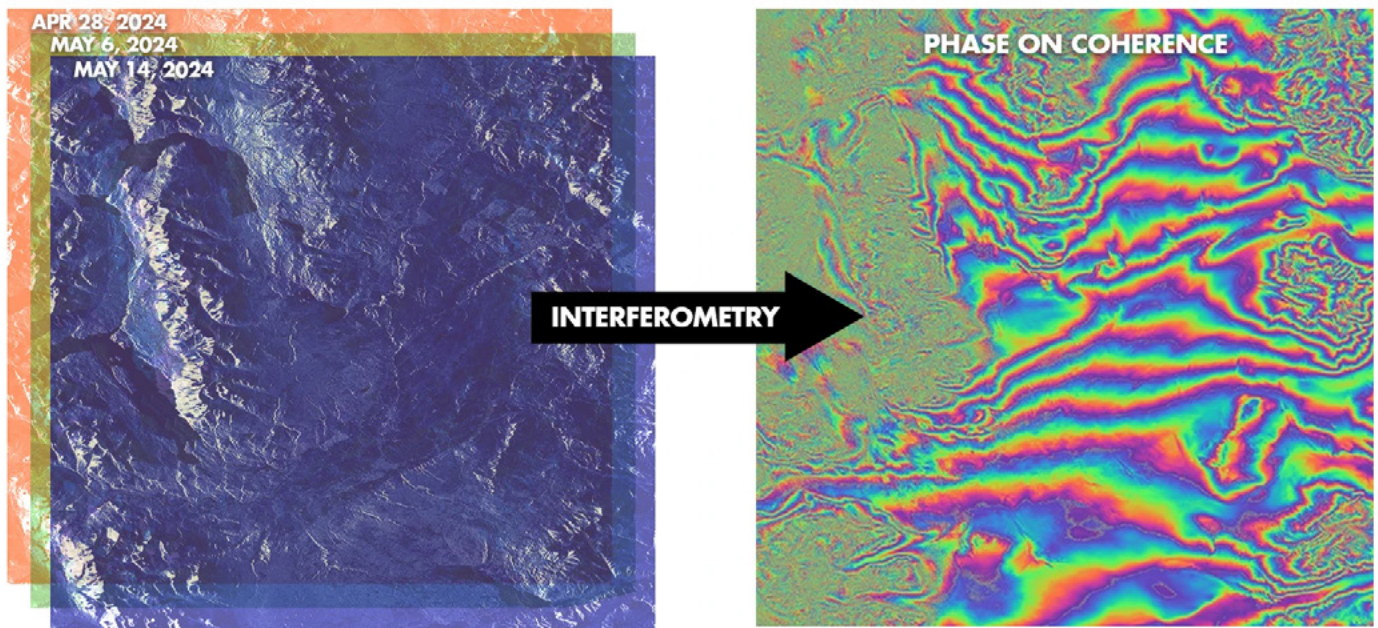
**SOIL MOISTURE
TIME SERIES**

Benefits: Agriculture



- Compare pixel-by-pixel soil moisture information from week to week.
- Detect notable changes in soil moisture at any site

SAR INTERFEROMETRIC STACKS



For interferometric studies, in-depth knowledge and powerful processing software are required. However, this is not enough; as data input, it is necessary to have series of SAR images of the target on different dates, respecting a series of very important requirements.

We provide these scene sets in compliance with the customer's requirements, delivering on time and on budget through a business model that always favors the customer, understanding the complexity of the global interferometric business.

The product consists of a set of scenes acquired under the requirements for use in SAR interferometry:

- Weekly, biweekly, monthly and annual sampling under the same observation angle
- Stripmap Scenes
- Business model oriented to VENG absorbs the risk that the baseline is not in accordance with the customer's requirement. If the baseline is not as agreed, the scene is not charged or delivered
- Great stack discounts
- Ascending and descending orbit

RAPID MONITORING OPTION



- The Rapid Monitoring Service offers the possibility of activating desired acquisition windows.
- Each acquisition window, which can be requested with at least 24 hours of anticipation, has a 5-day activity term. The maximum number of acquisitions per window is 12.
- The service has a fixed monthly fee, which includes 1 (one) activation window and the possibility of activating more windows (by request).
- If the customer wishes to activate more windows in the same period, he/she can request it.

More applications

- Mining, Oil & Gas Monitoring
- Drinkable Water Urban Leakage Detection
- Flood & Drought Monitoring
- Agricultural Data Monitoring

CUSTOMER ORIENTED OFFICE

2

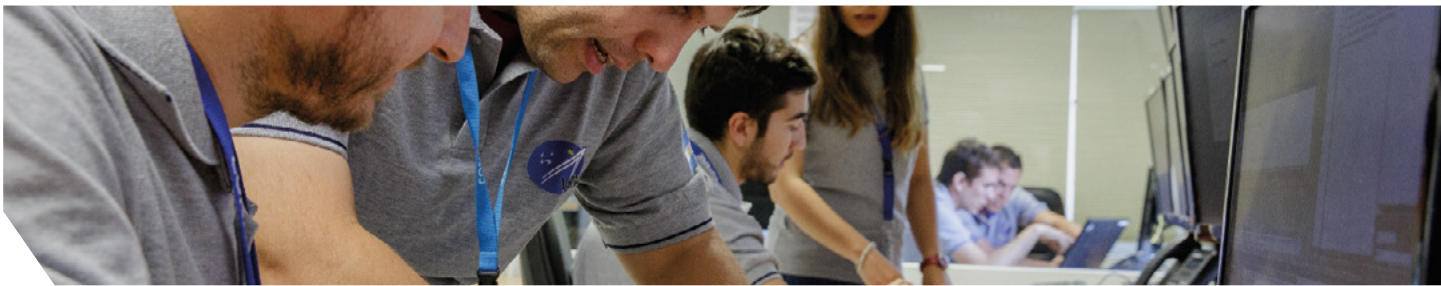
calendar days prior to the date and time of purchase

24

hours of monitoring to obtain a new acquisition

24

hours from receipt of order to deliver catalog orders



SAOCOM search and quotation platform



EASY-TO-USE



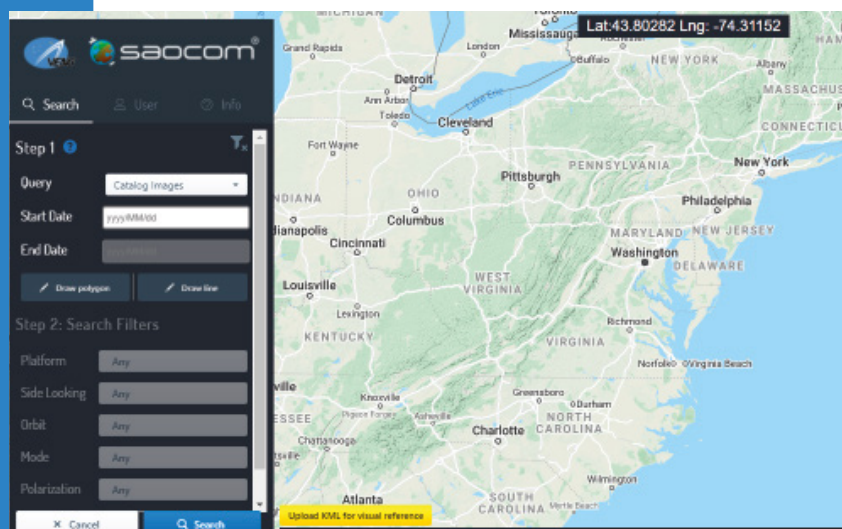
CATALOG IMAGES



FUTURE IMAGES



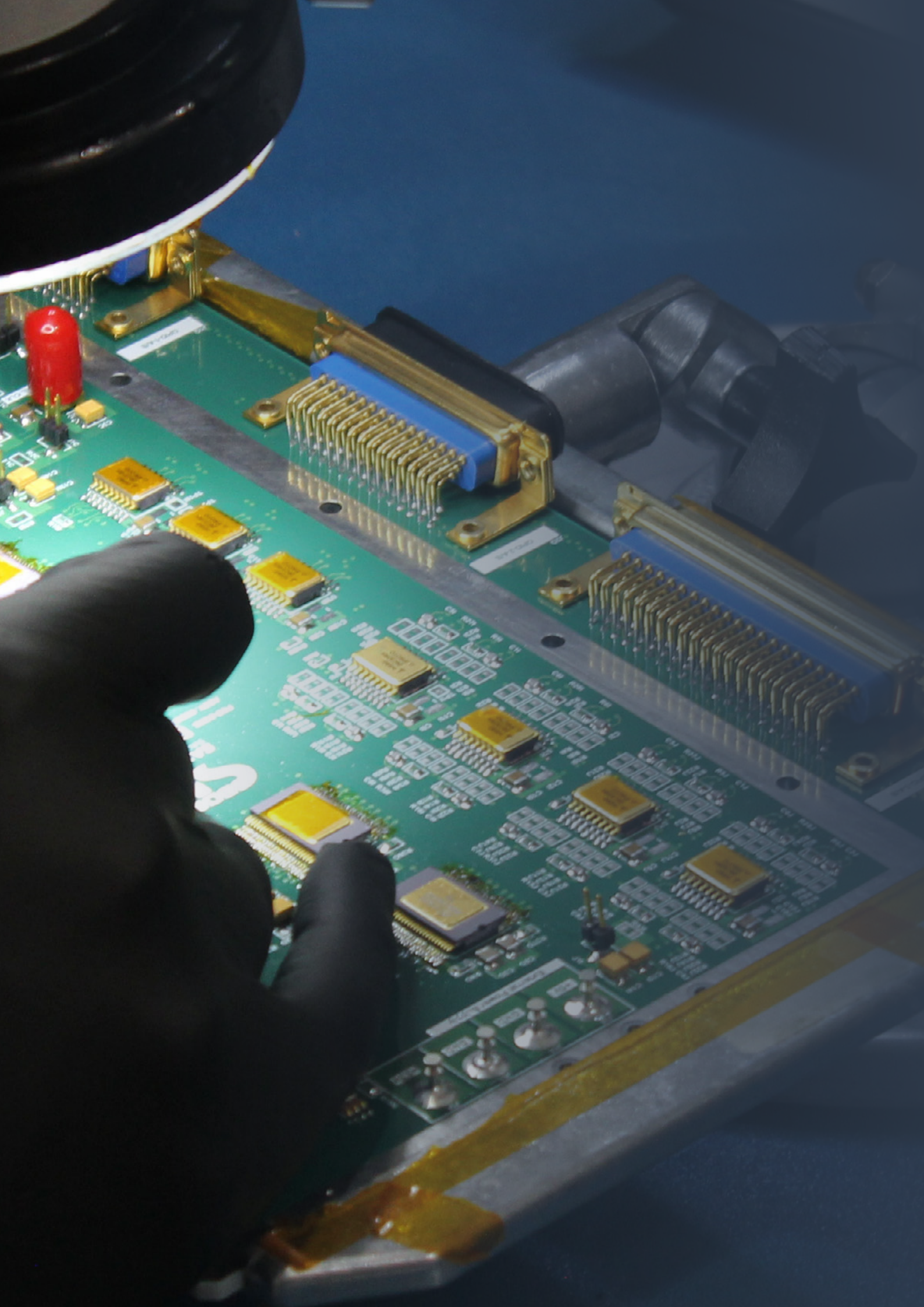
WWW.SAOCOM.COM.AR





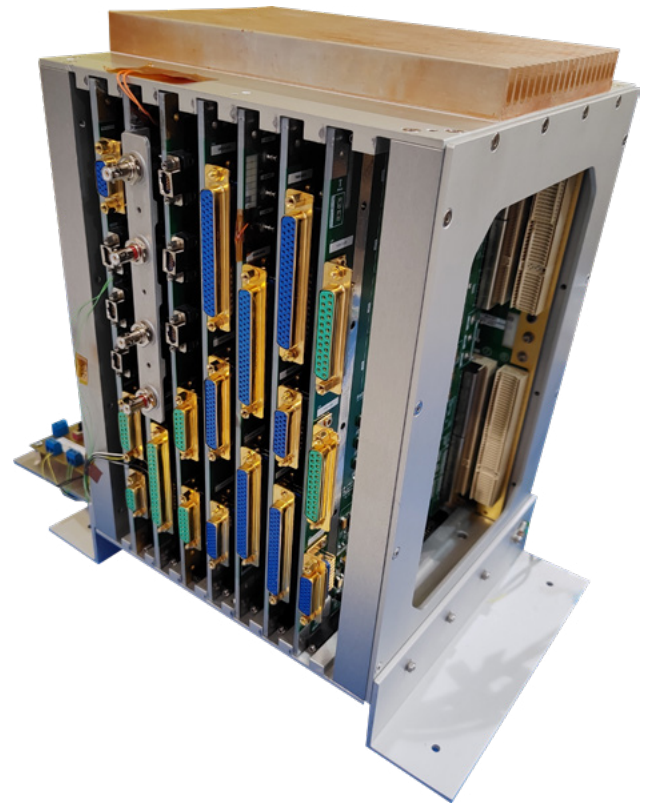
#6 //

PRODUCTS



ON BOARD COMPUTER

The On Board Computer (OBC), developed jointly by CONAE and VENG, is a complex electronic unit, developed to manage satellite mission instruments, with data transfer rates up to 100 Mbps, in addition to providing general interfaces bi-level RS -422, analog channels for voltages and temperatures acquisition (internal and external housekeeping information) and capacity to command up to 24 heaters, through opto-coupled outputs.



It has a power module, a Single Board Computer module based on the UT699 LEON3-FT 32-bit processor and 6 additional functional modules, all linked through the cPCI 2.2 standard through the use of a Backplane. It also has an additional slot, designed to adapt to the needs of different missions/projects.

Mechanical and operational features

	OBC WITHOUT REDUNDANCY (7 FUNCTIONAL MODULES)	OBC WITH REDUNDANCY COLD STANDBY (14 FUNCTIONAL MODULES)
DIMENSION	21x27x27 [cm]	39x27x27 [cm]
MASS	7,5 [Kg]	21 [Kg]
VOLTAGE	21-36 [V]	21-36 [V]
CONSUMPTION	Rated consumption: 30[W] Maximum consumption: 40[W]	Rated consumption: 30[W] Max.consumption: 40[W]
OPERATION TEMPERATURE	-10 °C to +40°C	-10 °C to +40°C
LIFE TIME	5 years	5 years

Components

POWERBOX

Consists of 2 DC-DC converters that provide 4 regulated secondary voltages (+3.3, +5, +12 and -12V) that the equipment needs from an unregulated primary input supply (redundant or not) that it can vary between 21 and 36 V. It also implements configurable capabilities according to the needs of the specific application:

- Isolation of secondary-primary returns
- Limitation of the in-rush current
- Delay so that not all secondary voltages appear simultaneously
- Configuration as essential load (always powered regardless of which of the primary power lines is active) or not

INSTRUMENT ACQUISITION

Has the capacity to acquire data generated by up to 4 instruments simultaneously through dedicated LVDS interfaces. The total acquisition speed for the 4 channels simultaneously is up to 200 Mbps.

CCSDS Packets “time-tagging” capability, with an uncertainty of less than 20 [μs]. In addition, this module has 3 Spacewire interfaces for transfer of acquired data at 100 Mbps. This transfer is carried out following the ECSS-E-ST-70-41-C (CCSDS Space Packet Protocol) standard.

COMMUNICATION

Has 1 MIL-STD-1553 Interface as a Remote Unit (designed for the exchange of telemetry and telecommand), with 1 MIL-STD-1553 Interface as Bus Controller (designed to command other equipment or instruments) and 9 full-duplex UART/RS-422 serial interface ports.

GENERAL PURPOSE INPUT/OUTPUT

This module has 30 bi-level RS-422 input lines, 22 bi-level RS-422 output lines and 10 open-collector output lines.

TEMPERATURE CONTROL

Has the capacity to command up to 24 action channels of 1[A] heaters. Each of these outputs is opto-coupled to maintain separation between the primary and secondary return.

SINGLE BOARD COMPUTER

Is the main module where processing, management and control activities are carried out. This module has the following blocks:

- UT699 LEON3-FT 32-bit processor
- RTEMS 4.10
- 2 redundant bootloader EEPROM memory banks
- 3 redundant banks of Program Flash Memory
- FPGA for the implementation of the interface via cPCI with the other 6 modules
- 3 Spacewire Interfaces
- 2 UART/RS-422 interfaces
- 2 RS-422 inputs for receiving synchronization pulses (PPS-in)
- 6 RS-422 outputs for synchronization pulse distribution (PPS-out)
- Watchdog provided by the capabilities of the UT699

TEMPERATURE ACQUISITION

Can acquire up to 96 temperature channels with a resolution of 12 bits grouped into 72 external and 24 internal temperature channels (3 channels for the OBC, 7 for calibration and 14 reserved for the expansion slot).



FATIGUE METER

We are pleased to introduce one of our first innovative products for the aviation industry: the Fatigue Meter, a device similar to the electromechanical types used in the market, but with an advanced electronic design of the latest technology with better features and a more reliable system.

The Fatigue Meter is an autonomous system that aims to register accelerations of the aircraft frame or center of gravity to monitor the structural life consumed during flight.

For this, it counts and registers the g values to which the aircraft is subjected, due to the acceleration or deceleration of the flight. Analysis of the 'g's recorded indicates the fatigue load in the structure of the aircraft and the collected data can be used to form realistic statistics and make informed decisions.

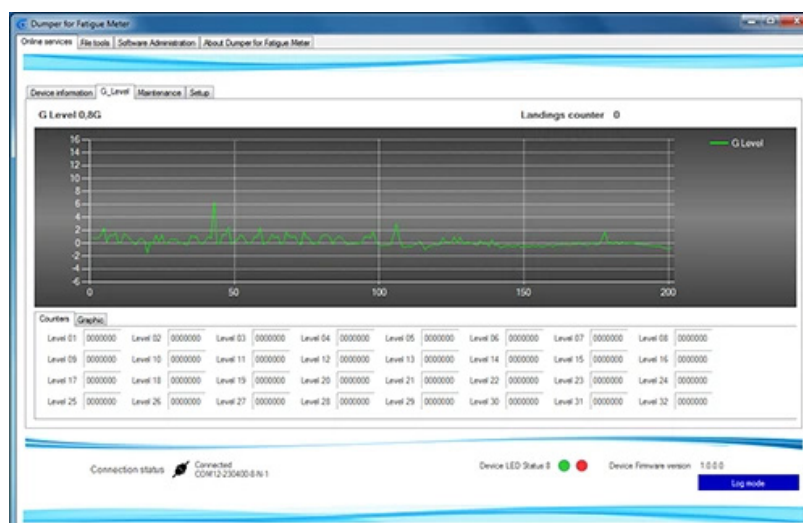


Military grade certifications

Enviromental MIL-STD-810H	EMC/EMI MIL-STD-461G	DC Power MIL-STD-704F
Safety SAE ARP-4761	Packaging MIL-STD-2073-1E	Identification MIL-STD-130N
	Software DO-178C	

Software

- Configure all the parameters of the equipment.
- View all data from current and previous records.
- Verify the functional status of the system and show the following parameters:
 - Sensor reading indicated in G
 - Battery voltage

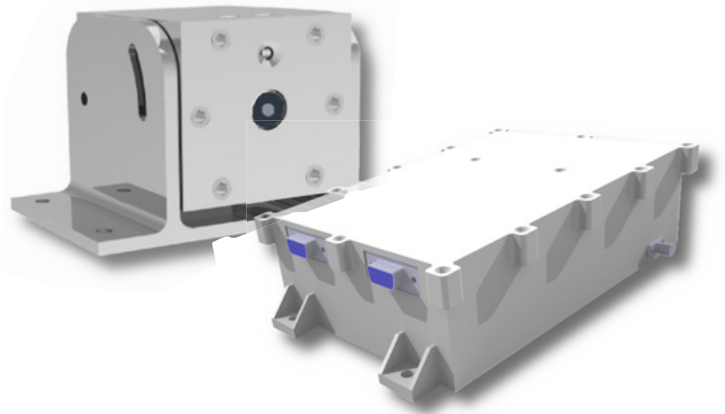


SVD DIGITAL VIDEO SYSTEM

In Development

Digital video system Tx unit and Rx software designed for launch vehicles. An on-board unit with four video cameras, each equipped with lighting, connected via a network cable to a main unit.

The unit powers the cameras, controls their lighting, receives the video streams, and sends it to a transmitting antenna. Specially designed software to control the Cortex RTR telemetry receiver series, enabling the video reception, local recording, transmission to a viewer and more.

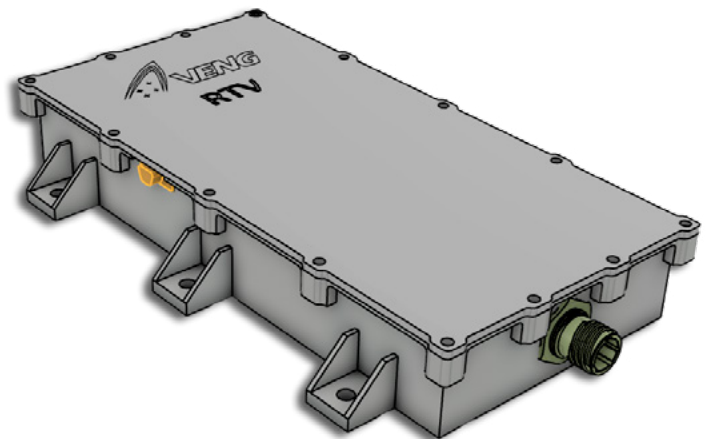


RTV - ENHANCED FLIGHT TERMINATION RECEIVER

In Development

The EFTS is a digital, FPGA-based, flight termination receiver that meets the requirements of the standard RCC 319, designed for space launch applications.

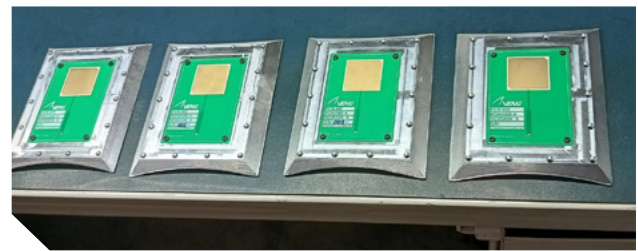
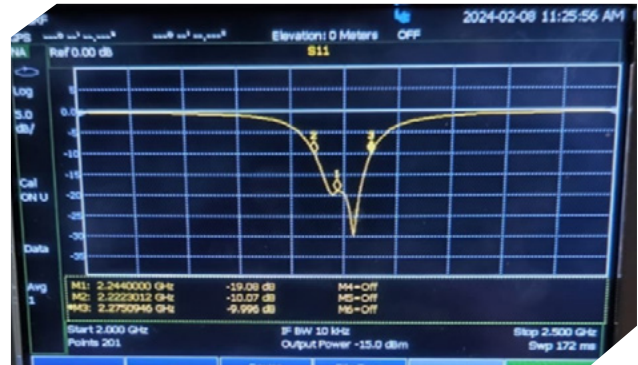
The EFTS provides a high dynamic range front-end, and a digital receiver that implements Reed-Solomon channel coding to enhance the link, as well as a 3-DES encryption to strengthen the mission security.



S-BAND PATCH ANTENNA

Released

High-precision antennas optimized for space applications, ensuring reliable communications for launch vehicles and satellites in extreme environments. Our comprehensive development process—from advanced electromagnetic design to rigorous testing in anechoic chambers—delivers mission-critical performance that meets the highest international standards in the space sector.

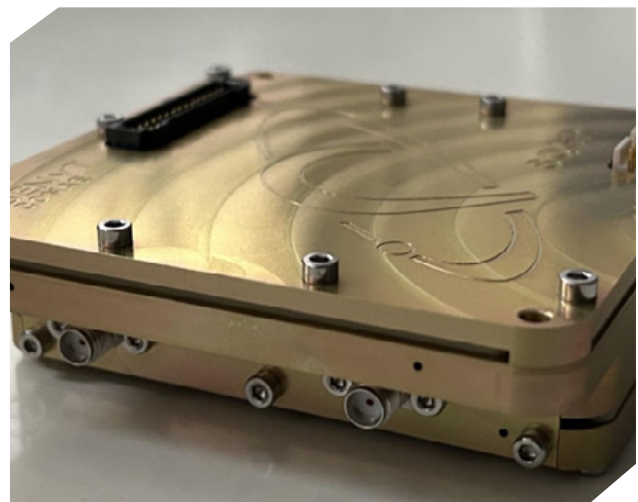


DUAL-ANTENNA AND DUAL-FREQUENCY GNSS RECEIVER

In Qualification

The SQGR series is a family of highly configurable dual-antenna and dual-frequency GPS/GLONASS receivers that offer positioning solutions for low-orbit and low-cost satellites as well as space launcher applications.

Its form factor, low power, and high performance provide an ideal solution for CubeSats and other nano-satellite missions.



ANTARTIX OBC COMPUTER

In Development

Is a high-performance, user-friendly on-board computer and FPGA development board built around the AMD Xilinx Artix-7 FPGA. Optimized for running MicroBlaze and PetaLinux, it delivers exceptional processing capabilities and is ideal for a wide range of space applications.

Fully compatible with the PCI/104-Express form factor, it ensures seamless integration into LEO nanosatellites, microsatellites, and launch vehicles. Its comprehensive set of interfaces enables reliable connectivity for subsystems and payloads, making it a versatile solution adaptable to the demands of any mission.

Engineered for versatility and reliability, Antartix v2.0 OBC is built entirely with extended temperature range components, ensuring robust performance in harsh environments. It features the AMD Xilinx XC7A200TFBG484I FPGA, and is also available in a variant populated with the XQ7A200T1RB484M, offering defense-grade qualification for mission-critical applications.



AVIONICS BATTERY

In Development

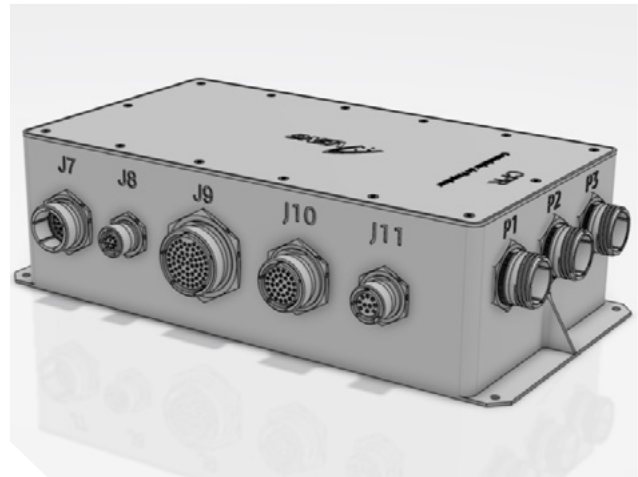
The cells used are NCA-type (Nickel Cobalt Aluminum - Lithium), and feature a specific energy of 243 Wh/kg with a nominal capacity of 3.35Ah. Each cell undergoes a rigorous selection process based on a statistical analysis of its capacities.



ENGINE CONTROLLER TEST BENCH VERSION

In Development

The Engine Controller is a cutting-edge solution engineered for the precise management of propulsion systems, including turbopump-fed engines. Designed for reliability, it ensures continuous monitoring and instant response to critical events. Its robust, autonomous architecture enables high-precision valve actuation, real-time sensor data acquisition, and seamless system status oversight, optimizing performance and safety.



S-BAND DATA TRANSMITTER

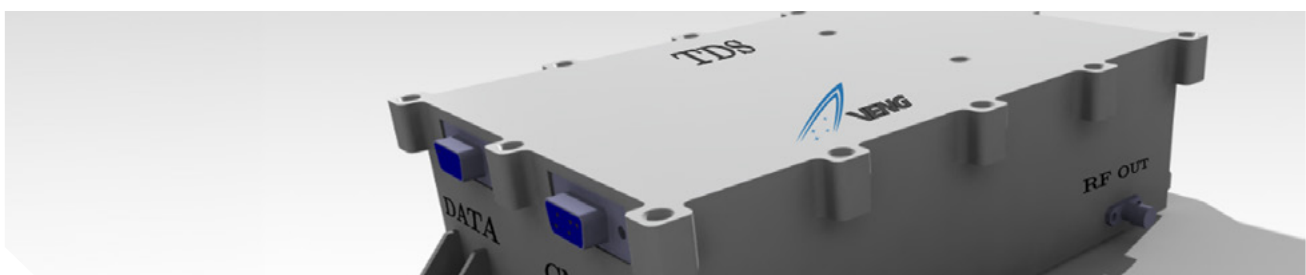
Released

TDS is an SDR based S-Band transmitter designed for launch vehicles, engineered to meet telemetry standards requirements.

It supports three modulation schemes defined by the IRIG-106 telemetry standard: PCM/FM (Tier 0), SO-QPSK (Tier 1) and Multi-h CPM (Tier 2).

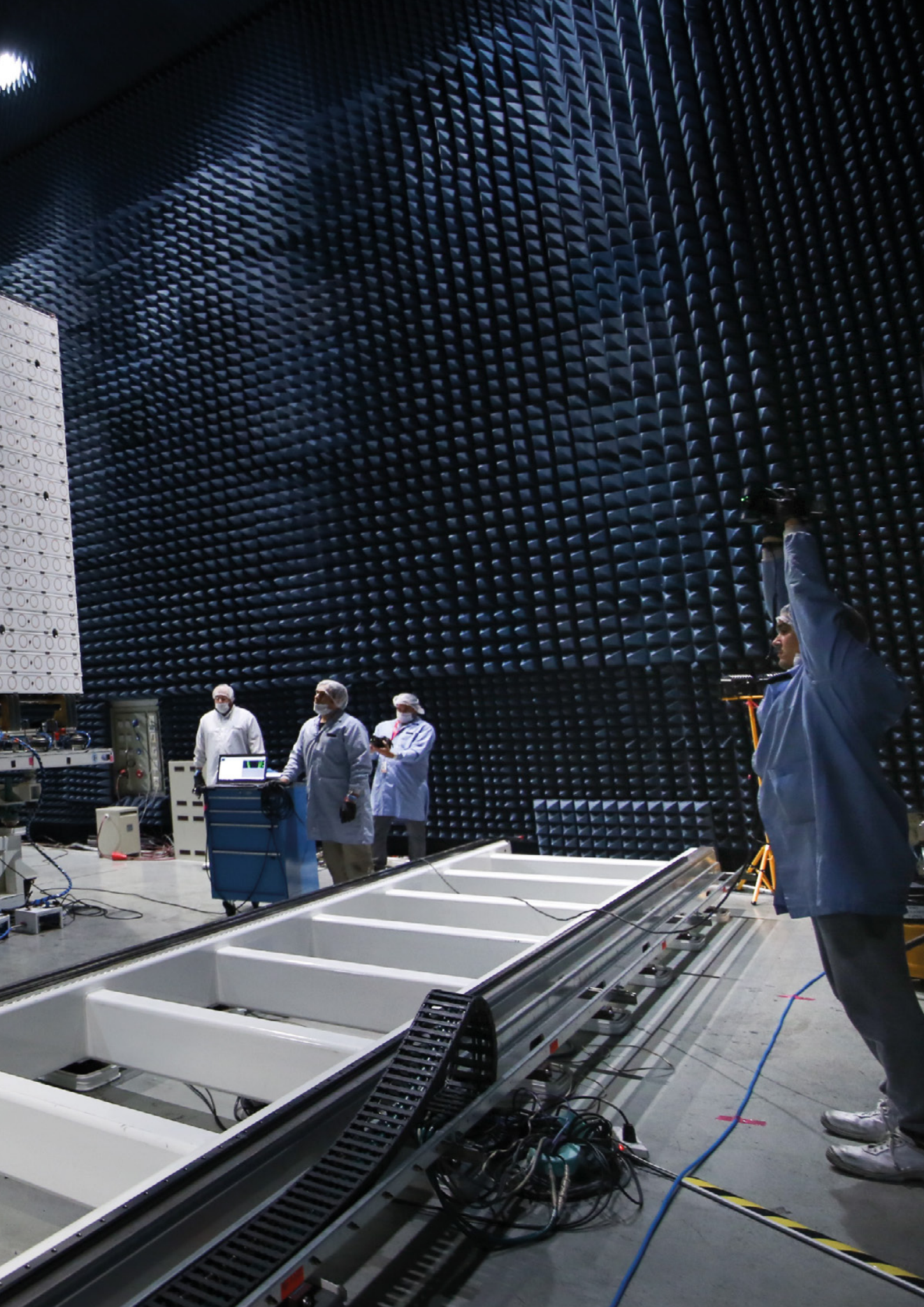
It also features CCSDS/IRIG randomization and convolutional (7, 1/2) channel coding, enhancing data integrity.

Its embedded Linux OS allows customization of the system to meet the specific mission requirements.



#7 // SERVICES





FACILITIES

LaIEM

Mechanical Integration & Testing Facility

LEM

Mechanical Testing
Facility

LaI Me

Mechanical Integration
Facility

LEA

Laboratory of
spatialization
and Assurance

LaRF

RF Testing Facility

LaIEE

Electronic Integration
& Testing Facility

LaTVC

Thermal Vacuum
Testing Facility

LaMA

Antenna Testing Facility

LaCEM

Electromagnetic
Compatibility Testing
Facility

LaREs

Space Coating Facility

Support Services



QA & PA



Configuration
Control



IT



Software



ELECTRONIC INTEGRATION AND TESTING SERVICES



The Electronic Integration Laboratory is an operational area where the production of electronic boards (assembly and soldering of components), integration of cable bundles (harness) and electronic assemblies is carried out by highly qualified personnel, certified by the high reliability soldering standards of the European Space Agency (ESA) and the Association of Electronic Connection Industries (IPC).

The products produced include all the electronics for the SAR antennas of the SAOCOM 1A and 1B satellites, electronics for parts of the SABIA-Mar project, specific components for military aircraft, interconnection cables for satellites and launchers, as well as products for the hydrocarbon industry.

Tests

Aerospace quality manual welding	High quality SMT soldering	Aerospace-quality harness assemblies
Integration, Fabrication, Modification and Repair of Electrical and Electronic Equipment/ Parts	Assembly of electronic boards in cabinets	Integration of electronic equipment racks (Example: EGSE Rack Integration)
Component assembly and PCB soldering	Qualified work under Electronic Equipment or Electronic Consulting Standards	Repair or replacement of components on Electronic Boards (PCBs)

Features

- Air treatment system that guarantees an environment with a quantity of 10,000 particles per cubic foot of air (Standard: Fed-std-209E / ISO14644) and with controlled temperature ($22^{\circ}\text{C} \pm 3^{\circ}\text{C}$) and humidity ($55\% \pm 15\%$).
- Processes supervised by qualified inspectors.
- Complex manual assembly, integration and assembly work.
- Production capacity with different quality grades (commercial, aeronautical, military, aerospace).
- Pre-room with the same air quality characteristics that serves as an interface between room 10,000 and room 100,000.

MECHANICAL INTEGRATION AND TESTING SERVICES



The Mechanical Integration and Testing Laboratory offers mechanical vibration testing, strain gauge measurements, accelerometer calibrations, design and high-level engineering consulting services required by the aerospace and defense industry, and can be extended to the automotive industry, medical equipment and industry in general.

From the space point of view, the stresses that the equipment (satellites, rockets and parts of these) will undergo during

the most critical stage of their flight from the structural point of view are reproduced. This stage is the launch, when the launcher begins its race into space to put them into orbit, and during which these elements are subjected to great mechanical stresses (transmitted through the structure) and acoustic stresses (transmitted through the structure and the surrounding environment).

To reproduce these vibrations, special equipment called shakers are used to achieve two objectives: on the one hand, to qualify the parts by subjecting them to stresses greater than those they are expected to receive during flight, to ensure that the design is adequate. On the other hand, acceptance tests are also performed on components to be flown, to ensure that no errors have been made during their manufacture or assembly.



Testings

Planning and development of mechanical vibration	Design and validation of MGSEs (mechanical support equipment)	Numerical, modal and structural simulation to predict the behavior of the parts to be tested
Analysis of test results	Accelerometers calibrations	Mechanical stress and strain testing using strain gauges (strain gauges)
Engineering consulting services	Free fall tests	

Features

- Air treatment that guarantees a 100 K type environment, with a quantity of 100,000 particles per cubic foot of air (Fed-std-209E standard) and with controlled temperature and humidity (Temperature: 22 ± 3 °C, relative humidity: $55 \pm 10\%$), complying with the ISO 8 standard (ISO14644 standard) of the "European Cooperation for Space Standardization" (ECSS).
- Laboratory equipped with "work islands" around each shaker, allowing integration and test preparation tasks to be performed at the foot of the machine, with an overhead crane for handling larger loads.
- Control room isolated from the testing sector, to provide greater comfort to personnel in the operation, at the same time reinforcing hearing protection and preventing impact risks due to detached parts.
- "Satellite" testing room, without air treatment conditions, equipped with a shaker of lower load capacity and an Instron machine for tensile tests. This room is used for mechanical testing of parts or devices that do not require a controlled environment, or are not admissible in a clean room.





Equipment

SHAKERS

The equipment called shakers (electro-mechanical vibrators) have a similar operation to a loudspeaker used to listen to music. They are composed of a fixed part and a mobile part, but unlike the speaker, these equipments do not have the membrane to produce waves in the air and generate the noise. For vibration tests, the less noise generated, the better, although a lot of noise is generated anyway. That is why, when the tests are performed, the laboratory personnel work with the gates closed and use ear protectors.

The characteristics and capabilities of this equipment can be represented by the force and acceleration that each can develop. The laboratory has available equipment ranging from 5.12 kN force at 111gr to 105kN force at 150g.



LDS V9-HBT 1220

SYNUSOIDAL FORCE (peak)	105 kN
ACCELERATION (sinusoidal peak)	150 g
RANDOM FORCE (ms)	105 kN
INTERNAL LOAD SUPPORT	1800 kg
ACCELERATION (random rms)	70 g
VELOCITY (sinusoidal peak)	3.0m/s
DISPLACEMENT (peak-peak)	- 76.2mm

**LDS V875-HBT 600**

SYNUSOIDAL FORCE (peak)	35.6 kN
ACCELERATION (sinusoidal peak)	112 g
RANDOM FORCE (ms)	35.6 kN
INTERNAL LOAD SUPPORT	600 kg
ACCELERATION (random rms)	100 g
VELOCITY (sinusoidal peak)	1.8m/s
DISPLACEMENT (peak-peak)	- 76.2mm

**LDS V780**

SYNUSOIDAL FORCE (peak)	5.12 kN
ACCELERATION (sinusoidal peak)	1088 m/s ²
RANDOM FORCE (ms)	4.23 kN
INTERNAL LOAD SUPPORT	100 kg
ACCELERATION (random rms)	490 m/s ²
VELOCITY (sinusoidal peak)	1.90 m/s
DISPLACEMENT (peak-peak)	- 25.4 mm

**UNHOLTZ-DICKIE S-452/ST**

SYNUSOIDAL FORCE (peak)	26.7 kN
ACCELERATION (sinusoidal peak)	120 g
RANDOM FORCE (ms)	26.7 kN
INTERNAL LOAD SUPPORT	272 kg
ACCELERATION (random rms)	100 g
VELOCITY (sinusoidal peak)	3.4m/s
DISPLACEMENT (peak-peak)	- 51mm



Tests

Random, sine and shock tests	Sinusoidal sweep test	Quasi-static test (sine burst)
Resonance search, monitoring and evaluation (RSTD)	Random-on-random trials (ROR)	Sine-on-random assays (SOR)
Shock Response Spectrum Synthesis (SRS)	Fatigue tests	Time Waveform Replication (TWR)
	Vibration tests according to MIL-STD, DIN, ISO, IEC, SAE	

Calibrators



B&K TYPE 3629

- Vibration transducer
- Calibration system

Equipment



SIENNA 325D LASER CABLE STRIPPING MACHINE

The SIENNA 300 series systems are table-top systems suitable for processing wires and cables with higher strength and hardness, insulating materials as well as the more standard wires and cables used in the manufacture of electronics products.



PCB INTEGRATION AND CABLE MANUFACTURING

The products produced include all the electronics for the SAR antennas of the SAO-COM 1A and 1B satellites, electronics for parts of the SABIA-Mar project, specific components for military aircraft, interconnection cables for satellites and launchers, as well as products for the hydrocarbon in-



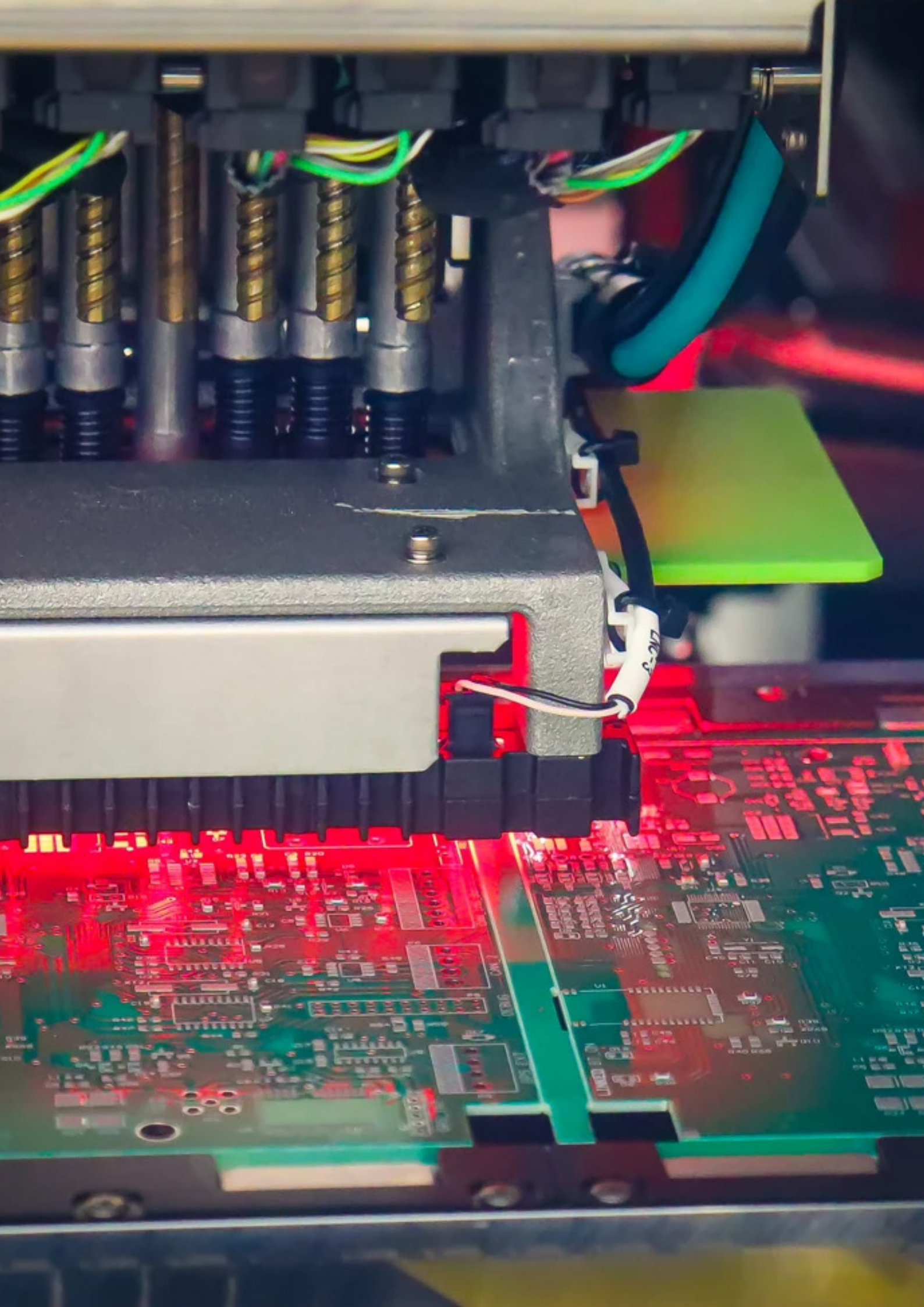
CNC MILLING MACHINE FOR DOUBLE LAYER PCB PROTOTYPING (LPKF ROUTER SYSTEM)

The LPKF ProtoMat X60 are specially designed circuit board plotters ideal for most in-house prototyping applications where speed and safety are essential, including multilayer and RF applications. These circuit board plotters feature particularly large working areas, perfect for antennas, sensors, sign etching, depaneling and large circuit board substrates.

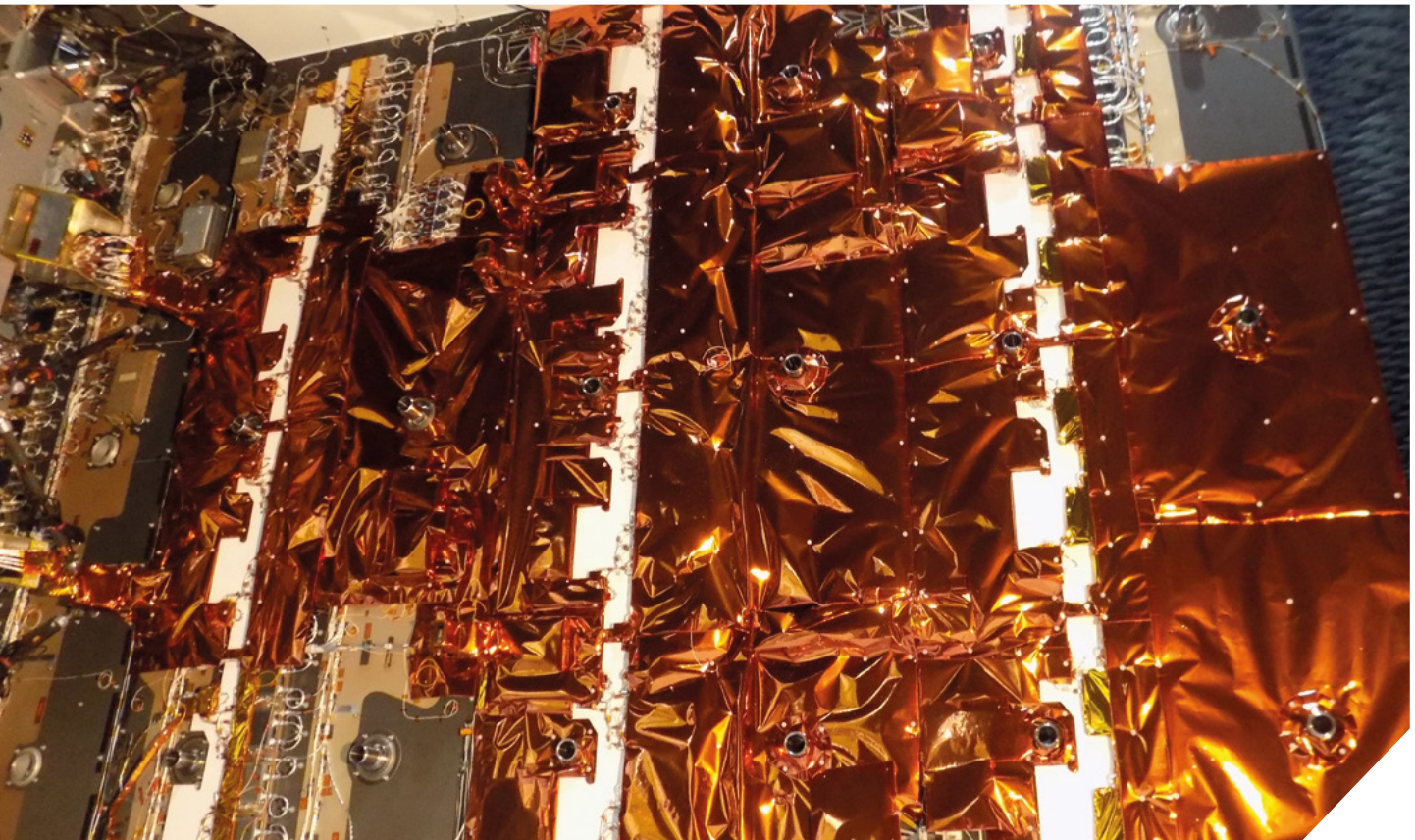


CABLE TENSILE TESTING MACHINES (PULL TEST)

The pull test consists of applying an axial stress to a specimen until it breaks. The strain rate applied must be low in order not to distort the result. During the tensile test, the force and extension of the specimen are measured.



SPECIALTY COATINGS SERVICES



In the Special Coatings Laboratory, processes related to thermal control coatings are developed, whether they are of the specific thermal paint type or multi-layered stacked coatings (MLI). Tailor-made preparation processes are carried out, as well as activities to ensure the quality of the environment and the inputs used.

These coatings, as components of the passive thermal control of a satellite or part of it, play a very important role given the extreme working conditions required by

the space environment (high vacuum and wide thermal range). In this context, the coatings act as protection for the hardware on which they are applied, functioning as a heat shield or as a radiation medium to dissipate excess heat.

Tests // Services

- Thermal analysis and design to adopt the optimal solution for the product in terms of coatings.
- Development of ad hoc processes for paint application (aeronautical or space) and final acceptance of treated parts.
- Design and manufacturing of MLI (multi-layer stacking).
- Thickness measurements of dry coatings on ferrous, non-ferrous and non-metallic substrates.
- Salt spray testing.
- Adhesion tests.
- Measurement of thermo-optical properties.

Features

- Air treatment that guarantees a 100 K type environment, with a quantity of 100,000 particles per cubic foot of air (Fed-std-209E Standard) and with controlled temperature and humidity (Temperature: 22 ± 3 °C, relative humidity: 55 ± 10 %), complying with the ISO 8 standard (ISO14644 standard) of the "European Cooperation for Space Standardization" (ECSS).
- 3 internal rooms with independent environmental control: a room type 100K with temperature, humidity and particle control for preparation activities; a room with temperature and humidity control, equipped with a suction front for painting activities; and another room type 100K with a wide range of temperature and relative humidity control, for customized curing of paints.
- Specific equipment for the preparation and treatment of high performance coatings: deionizer for obtaining high purity water (18 Megaohm), ball mill for grinding solid compounds, controlled paint storage system (safety cabinets and freezer), spraying equipment with HVLP technology, airbrushes for rework and adjustments, 3D printer for prototyping and manufacturing of process support devices.



Equipment and capabilities



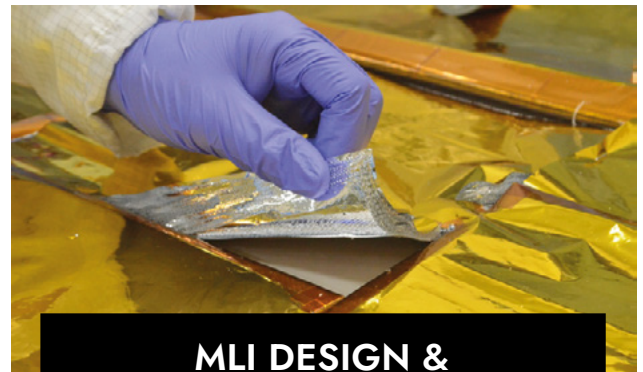
**THERMAL-CONTROL
COATING APPLICATION**



CURING ROOM



**MEASUREMENT OF
THERMOPTIC PROPERTIES**

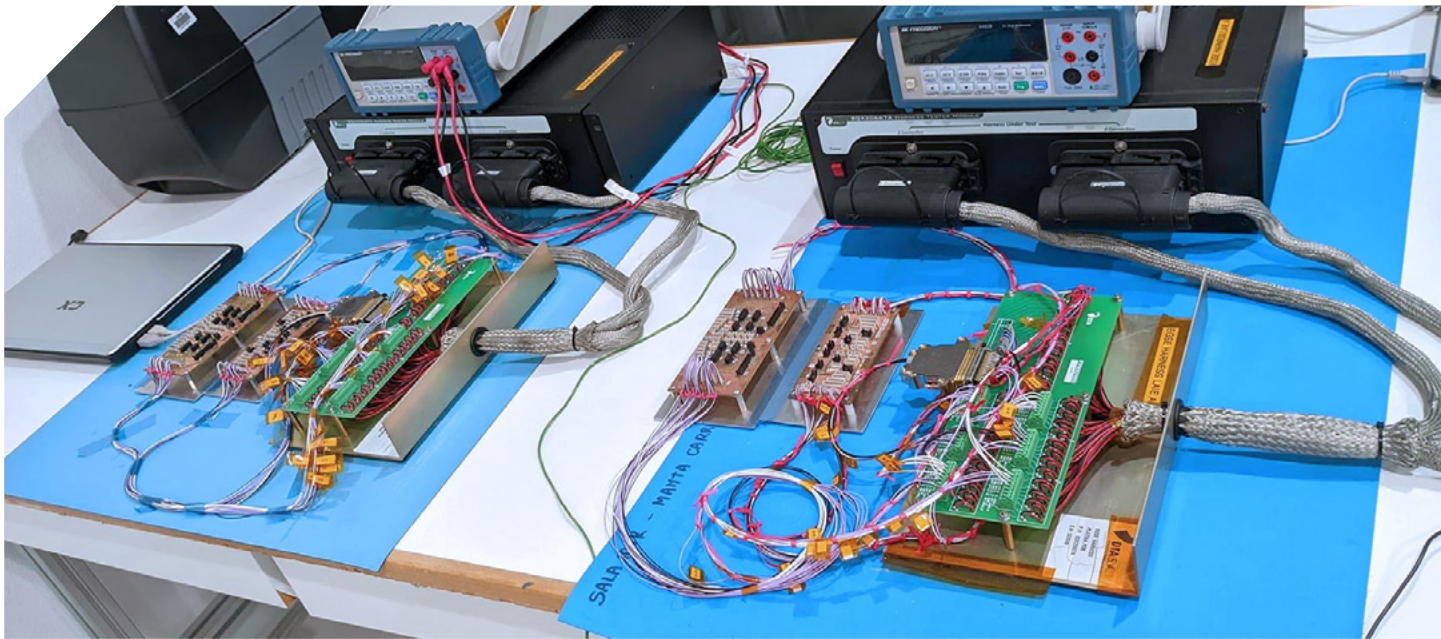


**MLI DESIGN &
MANUFACTURING**



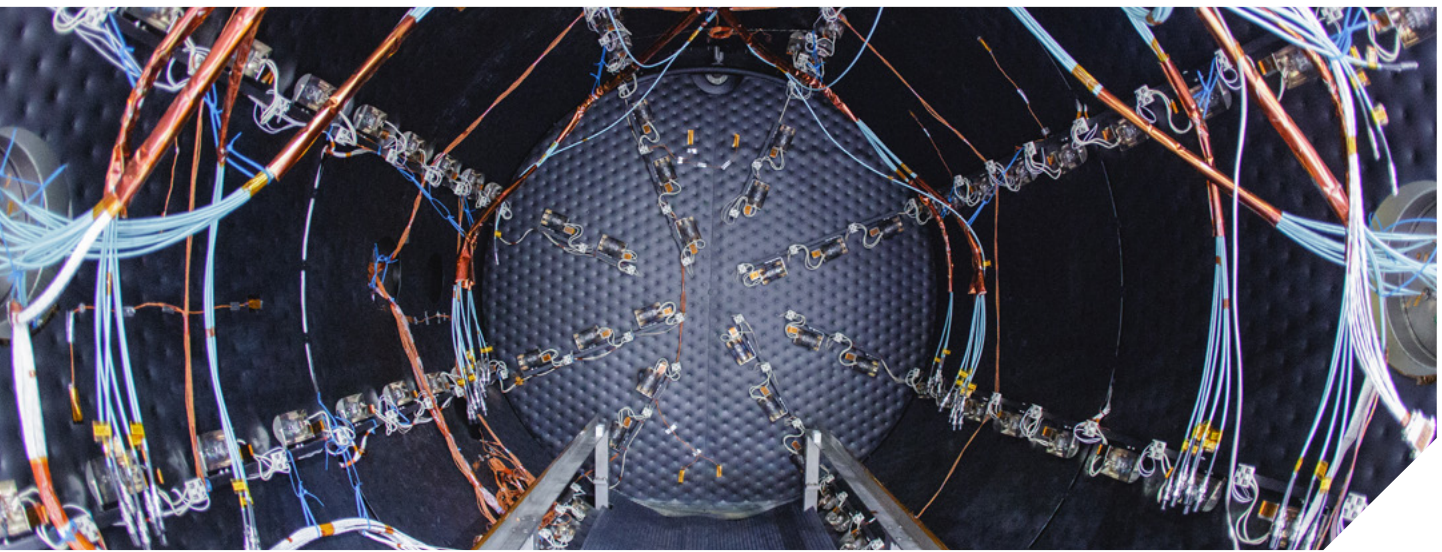
PREPARATION ROOM

RF TESTING FACILITY



Performance Testing	Functional Test	Radio Frequency Test (<50ghz) Noise figure measurement False measurement
Debug, Nonconformities	Calibrations	Pulsed radiofrequency signal test Characterization of active/passive devices (filters, amplifiers, others)
MIL-1553 V&V	Grounding, Bonding and Insulation Tests	Environmental characterization test

INTEGRATION AND THERMAL TESTING SERVICES



In this laboratory, thermal and humidity tests are performed under vacuum or ambient conditions (atmospheric pressure). These tests make it possible to simulate the extreme conditions of the service environment of the assemblies or their components, in order to characterize their behavior or to guarantee their operation.

Thermal vacuum tests are part of the environmental tests that satellites must comply with in order to meet mission requirements and are therefore of utmost importance in the manufacturing cycle of any space part or component. Chambers that simulate space environment conditions, called thermo vacuum chambers, are used.

The tests performed on the ground consist of placing the satellite or part of it inside these chambers under high vacuum conditions and exposing them to different thermal conditions. The satellite has to be prepared to withstand abrupt temperature changes without altering its performance.

In addition, this laboratory integrates thermal components, such as temperature sensors, thermostats or heaters, which are responsible for controlling that the different elements of the satellite do not operate outside the critical ranges expected in flight.

Tests // Services

Thermo-vacuum tests	Environmental thermal cycling tests	Thermal shock test
Moisture testing	Integration of active thermal control elements	Bakeout (decontamination bakeouts)
Numerical simulation to predict the behavior of the devices under test	Engineering consultancy for test definition and planning	Calibration of temperature sensors

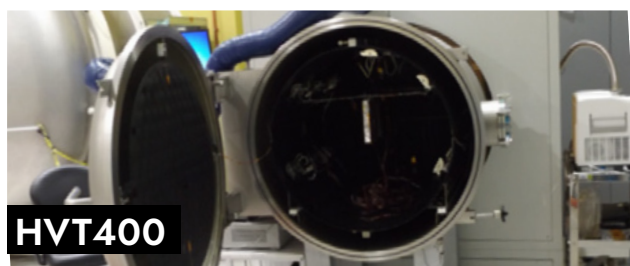
Design of thermal MGSEs (mechanical support equipment) and thermal setups (equipment to set specific test conditions)



Features

- Air treatment ensuring a 100K type environment, with a particle count of 100,000 particles per cubic foot of air (Fed-std-209E standard) and with controlled temperature and humidity (Temperature: 22 ± 3 °C relative humidity: 55 ± 10 %), complying with ISO 8 (ISO14644 standard) of the "European Cooperation for Space Standardization" (ECSS). (ECSS).
- 2 internal rooms with independent environmental control: both rooms type 100K with temperature, humidity and particle control for preparation and integration activities.
- 3 thermo-vacuum chambers of different sizes adaptable to each device to be tested, with an operating range between -190°C and 130°C, controlled with halogen lamps or resistors for heating and liquid nitrogen for cooling; reaching a vacuum level in the order of 1×10^{-6} mbar in any of them, with the use of a 3-stage pumping system. More than one thousand temperature sensors available for monitoring the tests.
- 2 Environmental chambers for thermal cycling tests with temperature control between -75°C and 180°C and humidity between 5%RH and 98%RH.
- Laboratory equipped with "work islands" around each chamber, which allow performing integration tasks and preparation of tests at the foot of the machine, also having a bridge crane for handling larger loads.
- Control room isolated from the test sector, to monitor the tests with each of the thermo-vacuum and environmental chambers, providing greater comfort to the personnel in the operation and at the same time preventing risks associated with the work.
- Standard equipment for the calibration of temperature sensors, with an operating range between -100°C and 155°C.
- Permanent oxygen level monitoring system throughout the laboratory for the use of liquid and gaseous nitrogen, and a centralized alarm system that warns of a nitrogen leak.
- Controlled stock system for the storage of components and supplies.

Equipment



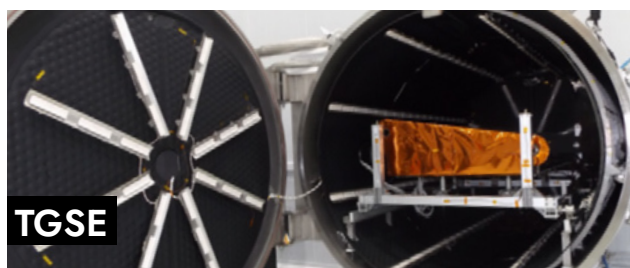
HVT400

USEFUL VOLUME	316 liters
USEFUL MEASUREMENTS	710 mm diameter 800 mm depth
LAST PRESSURE	1x10 ⁻⁶ mbar
TEMPERATURE RANGE	-190°C / 130°C
MAX. WEIGHT (DUT)	40 kg



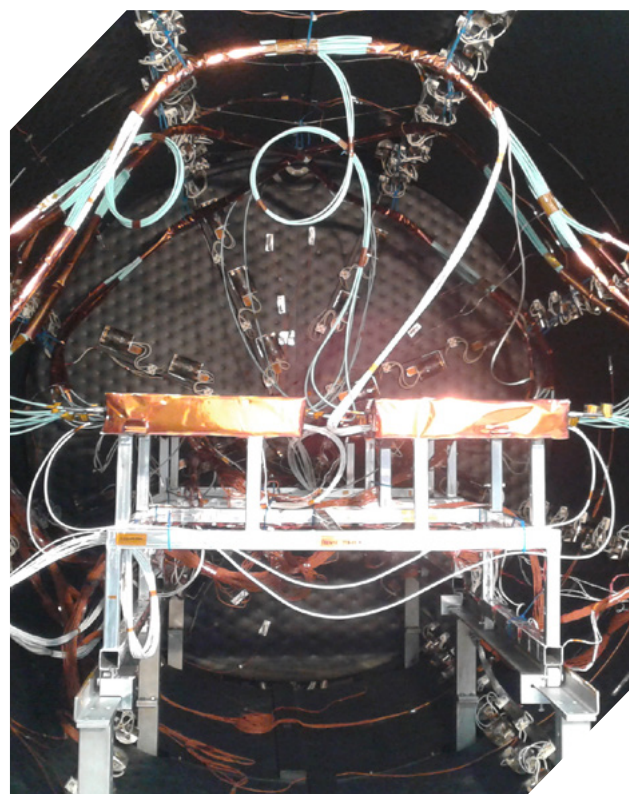
HVT10100

USEFUL VOLUME	9500 liters
USEFUL MEASUREMENTS	2050 mm diameter 3030 mm depth
LAST PRESSURE	1x10 ⁻⁶ mbar
TEMPERATURE RANGE	-190°C / 130°C
MAX. WEIGHT (DUT)	200 kg



TGSE

USEFUL VOLUME	31230 liters
USEFUL MEASUREMENTS	2560 mm diameter 5000 mm depth
LAST PRESSURE	1x10 ⁻⁶ mbar
TEMPERATURE RANGE	-190°C / 130°C
MAX. WEIGHT (DUT)	500 kg





USEFUL VOLUME 454 liters

USEFUL MEASUREMENTS 880 mm width
580 mm depth
890 mm high

LAST PRESSURE -75°C / 180°C

TEMPERATURE RANGE 5% / 98%

MAX. WEIGHT (DUT) 50 kg



USEFUL VOLUME 1368 liters

USEFUL MEASUREMENTS 1000 mm wide
1342 mm deep
1020 mm high

LAST PRESSURE -75°C / 180°C

TEMPERATURE RANGE 5% / 98%

MAX. WEIGHT (DUT) 50 kg



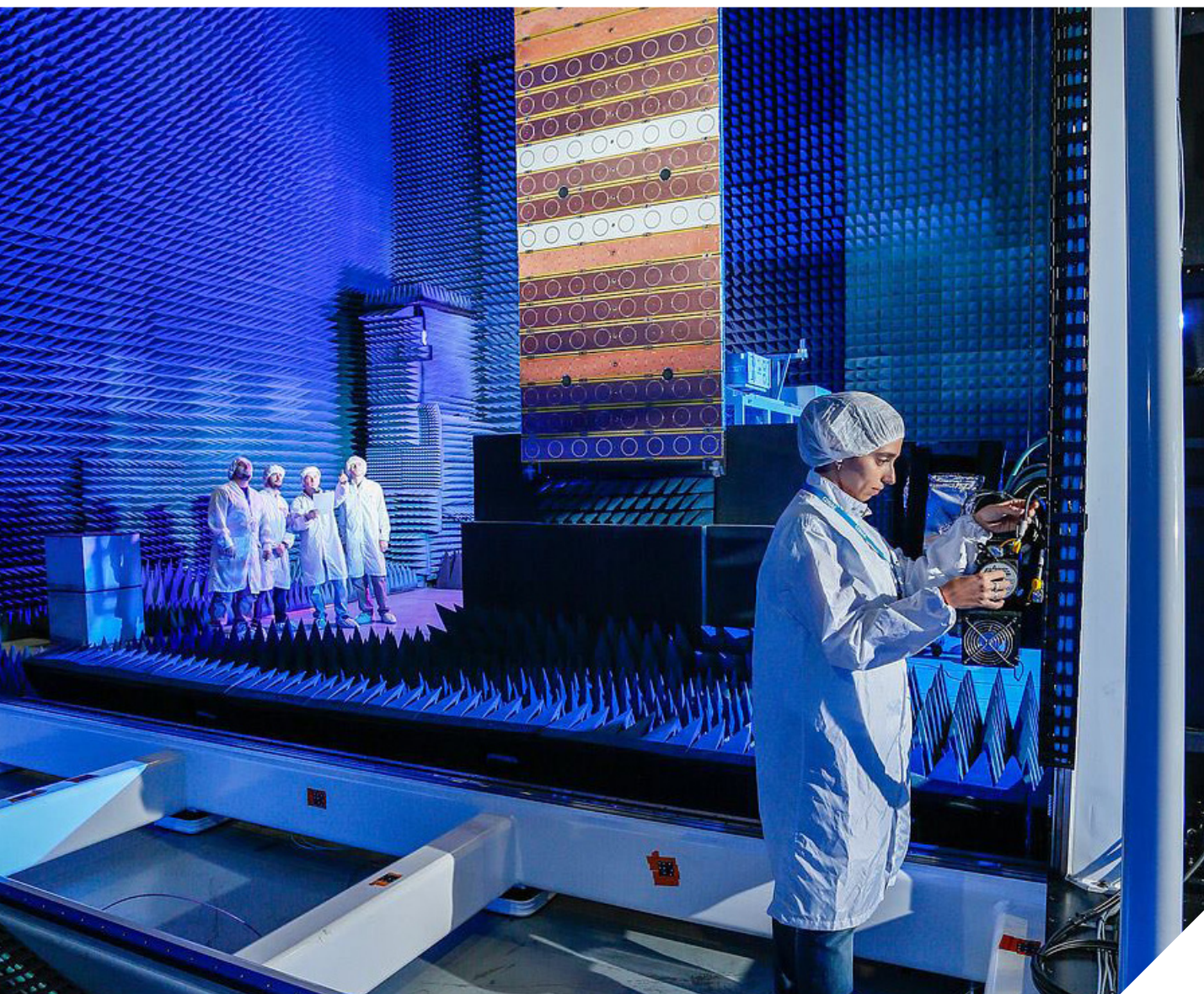
TEMPERATURE CALIBRATOR



OPERATING RANGE -100°C to 155°C



ANTENNA DESIGN AND TESTING SERVICES



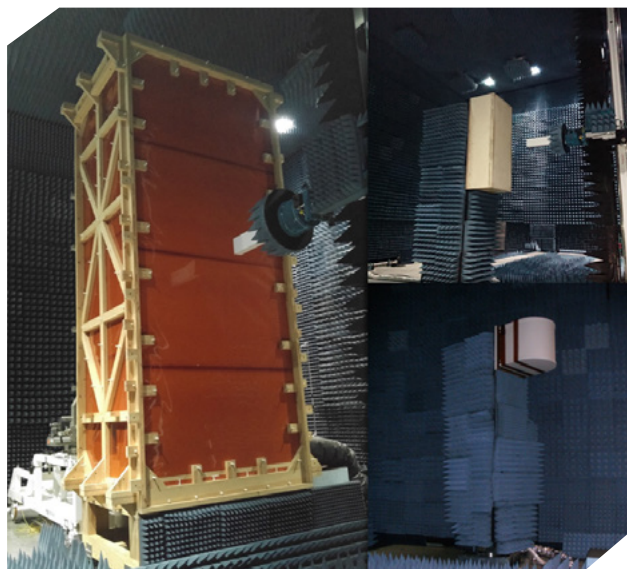
In the Antenna Design and Testing Laboratory facilities, tests related to the functional parameters of the antennas can be performed, such as: radiation properties, S-parameters, power, among others. In addition, the available Ane-

choic Chambers are also suitable for acoustic tests. In terms of development, design and construction of antennas are available options.

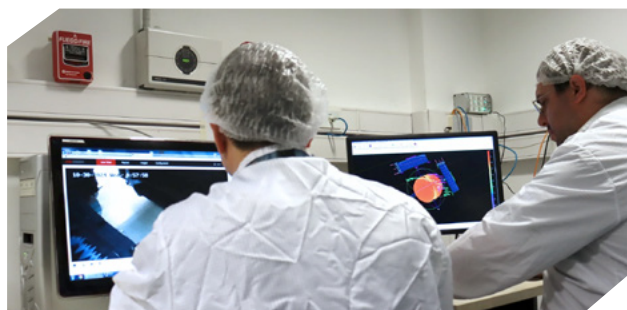


LaMA has 3 Anechoic Chambers of different sizes, equipped with high quality measuring instruments, which allow performing different types of tests according to the requirements requested by the customers. The coordinate systems that can be used are *Planar*, *Cylindrical* and *Spherical*.

In addition, it is able to perform tests at different temperatures by inserting the antennas inside the **Cámaras Térmicas** available in the laboratory. In particular, for cylindrical coordinates and small or medium-sized antennas (dimensions up to 1.5 m x 0.5 m x 0.5 m), the thermal measurement range is from -100°C to 100°C; while in the planar system and for large antennas (up to 1.5 m x 3.5 m x 1 m), the same is from -60°C to 70°C.



In the case of **Power Handling** tests, the available frequency range is between 800 MHz and 3 GHz.



Antenna designs and analysis are performed with commercial software using finite element methods applied to electromagnetic structures.

Activities // Services

Radiation testing between 300 MHz and 40 GHz	High power testing between 800 MHz and 3 GHz	Radiation tests in spherical configuration: 360° x 360°
Radiation tests in cylindrical configuration: 5.4 m x 360°	Radiation tests in planar configuration: 11 m x 5.4 m	Radiation vs. temperature tests from -100°C to 100°C (maximum range)
S-parameter measurements		Acoustic testing

FEATURES

- Air treatment system that guarantees an environment with a quantity of 100,000 particles per cubic foot of air (Standard: Fed-std-209E / ISO14644), and with controlled temperature and humidity (Temperature: 22°C ± 3°C, Relative Humidity: 55% ± 10%), complying with the ISO 8 (ISO14644) standard of the European Cooperation for Space Standardization (ECSS).
- Laboratory consisting of 3 ISO 8 class anechoic chambers, designed to absorb all the reflections produced by electromagnetic waves on any of the surfaces (floor, ceiling and side walls). At the same time, they are isolated from the outside, which protects them from any source of external influence. The combination of these two factors means that the rooms emulate space-like conditions.

Equipment



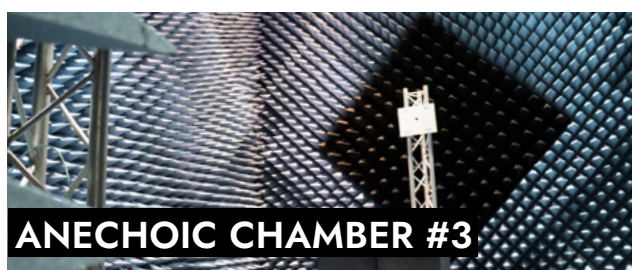
Dimensions: 12.5 m x 13.5 m x 8.5 m
(depth x width x height)

It has a Near Field System Inc. (NSI-MI) measurement system, which is composed of angular displacement axes in Azimuth, Pol and Phi, and linear displacement in X, Y, Z.



Dimensions: 4.9 m x 2.6 m x 1.6 m
(depth x width x height)

It has a Near Field System Inc. (NSI-MI) measurement system, composed of angular displacement axes, in Azimuth, Pol and Phi.



Dimensions: 7.23 m x 5.95 m x 7 m
(depth x width x height)

It has a **Vector Network Analyzer** that is mainly used in this chamber for antenna calibration (Brand: Agilent, Model: N5245A).



ELECTROMAGNETIC COMPATIBILITY SERVICES



LaCEM performs all electromagnetic compatibility testing, analysis, measurement, evaluation and reporting services in a complete and reliable manner.

Electromagnetic compatibility testing (EMC) is essential to ensure that electronic devices and systems can operate correctly in an electromagnetic environment and avoid unwanted interference that may affect their operation or that of

other nearby devices. These tests are governed and regulated under strict standards such as IEC (International Electrotechnical Commission), for the industrial and scientific part, MIL-STD (military standard) for the aerospace part, etc.

Tests

➤ Emission test (conducted and radiated)

This test is performed to measure the amount of electromagnetic energy that a device emits. The amount of energy is measured at different frequencies to ensure that it does not exceed the limits set by regulatory agencies.

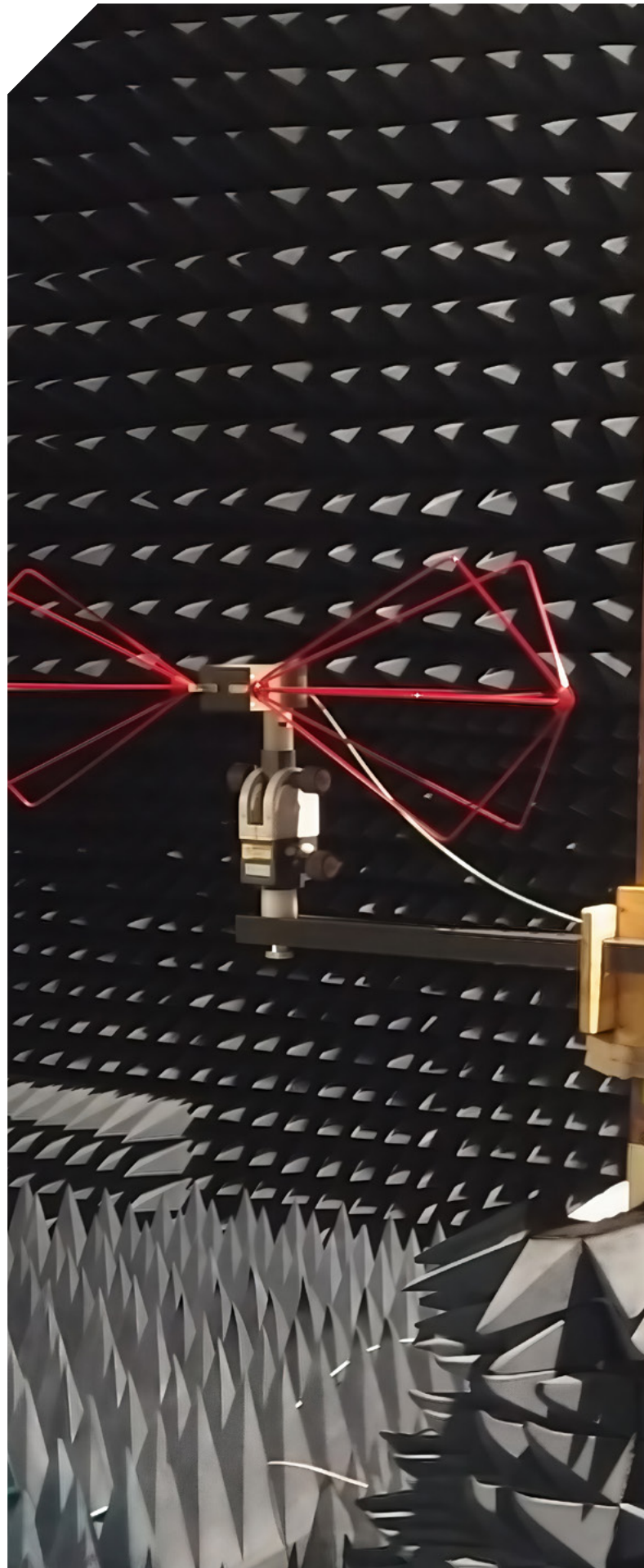
➤ Immunity test (conducted and radiated)

This test is performed to measure the ability of a device to resist the effects of electromagnetic interference from its environment. The device is subjected to a variety of interference conditions, such as radio waves, magnetic fields and electrical transients to measure its resistance.

➤ Electrostatic discharge test

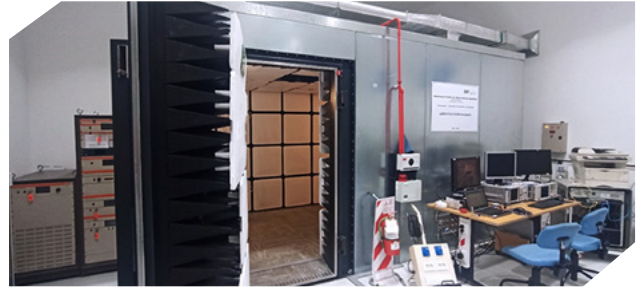
This test is performed to measure the ability of a device to withstand electrostatic discharge (ESD) and prevent failure or damage. The device is subjected to high voltage discharges to verify its resistance capability.

In addition, pre-compliance tests are performed, providing assistance and advice to industries that manufacture equipment with electronic systems, in order to guide them in the solution of design and development problems through tests, to comply with the required standards and thus be able to market the products they manufacture.



Equipment

The laboratory consists of two semi-anechoic chambers. One of the chambers is located in a class 100,000 room, with a frequency range from 9KHz to 18GHz, with amplitudes up to 200V/m. The other chamber is 1m for subsystems, with a frequency range from 10K to 18Ghz with field amplitudes up to 100V/m.



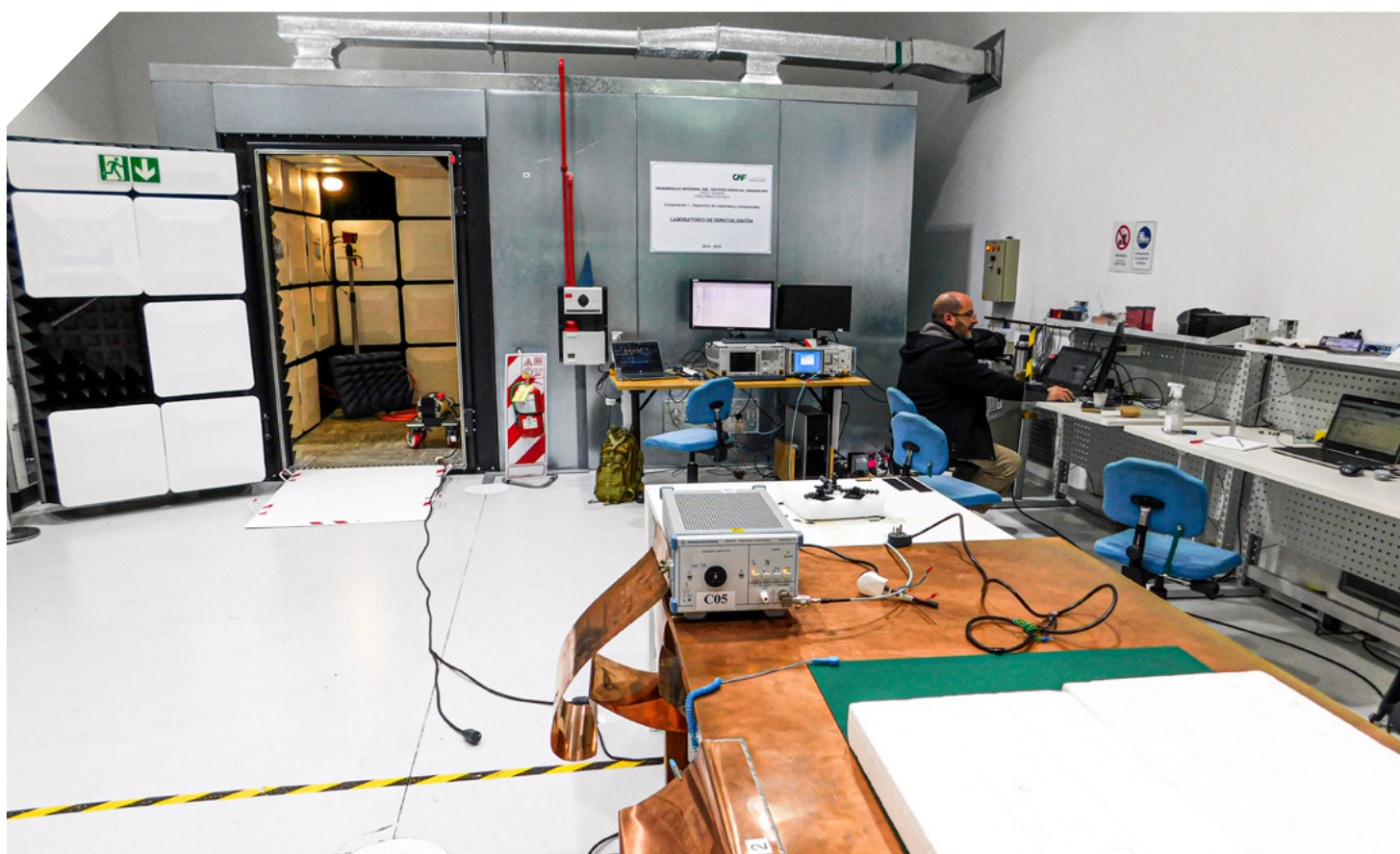
Services

Emissions conducted	Conducted susceptibility	Radiated emissions
Radiated susceptibility	Grounding	Bonding
Isolation	ESD	Inrush (In voltage and current)
BCI	Spurious	Safety
	Thermography control	

We offer testing for the following standards



DO-160



PRECISION METROLOGY SERVICES

Spatial quality precision metrology service and solutions, with the ability to measure and align complex parts/structures under the highest quality standards.



FARO Laser Tracker VANTAGE

It is an extremely accurate, portable coordinate measuring machine that enables you to build products, optimize processes, and deliver solutions by measuring quickly, simply and precisely.

➤ Distance measurement performance

Resolution

0,5 μ m

Precision (MPE)

16 μ m + 0,8 μ m/m

➤ Angular measurement performance

Angle precision (MPE)

20 μ m + 5 μ m/m

Precision Level Accuracy

± 2 arc sec

Geodetic Systems V-STARS M Photogrammetry



V-STARS M employs multiple cameras and operates as a portable optical coordinate measurement machine (CMM) to provide 3D coordinate measurement in real-time, in both stable and unstable environments, at a rate of up to 10 points per second. V-STARS M employs two or more custom-built digital cameras, presently either INCA4 or DynaMO high-speed, high resolution cameras, to make accurate, real-time measurements of static or dynamic objects, through use of wireless operated tactile probes, retro-reflective targets or projected PRO-SPOT points.

➤ INCA4

Accuracy

$9\mu\text{m} + 9\mu\text{m}/\text{m}$ or 1:90.000

➤ Dynamo D5

Accuracy

$14\mu\text{m} + 14\mu\text{m}/\text{m}$ or 1:60.000

➤ PRO-SPOT

Point density

600 to 23.000 pts



Mentor Visual iQ

These videoscopes allow mapping, measuring and analyzing 3D indications and improving probability of detection (POD) by verifying the job in real time. Mentor Visual iQ provides the processing power to operate 3D phase measurement and 3D stereo measurement with point cloud analysis.

➤ Diameter Probe

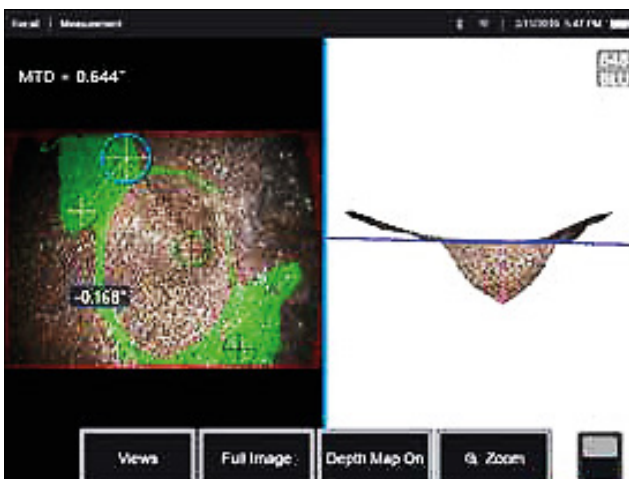
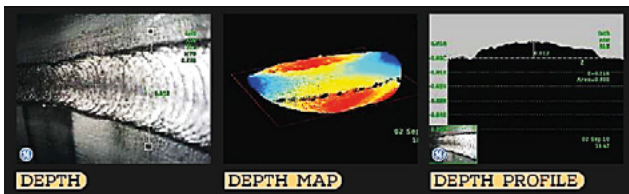
4.0 mm (0.16"), 6.1 mm (0.24"),
8.4 mm (0.33)

➤ Image Sensor

1/6" Color Super HAD™ CCD
camera
(6.1) 1/10" (4.0 mm)

➤ Pixel Count

440,000 pixels





MECHANICAL ENGINEERING

The Aeronautical Mechanical Engineering team of VENG has extensive experience linked to the flow of MAIT (Manufacturing, Assembly, Integration and Testing) of space systems, based on the main standards of this industry, such as NASA and ESA. Notwithstanding the specificity of these disciplines, it has been possible to transfer this knowledge to other sectors, such as general industry, aeronautics and nuclear.



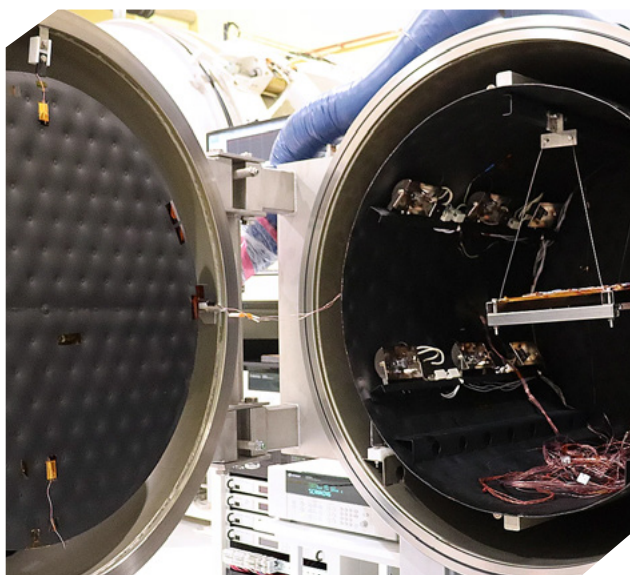
The team has outstanding professionals in the design and analysis of mechanical and thermal specialties; using state-of-the-art tools, such as SolidWorks and Ansys software. In addition, it is highly skilled in the elaboration of test plans, in order to close the verification and validation cycle of the designed systems.

Industries

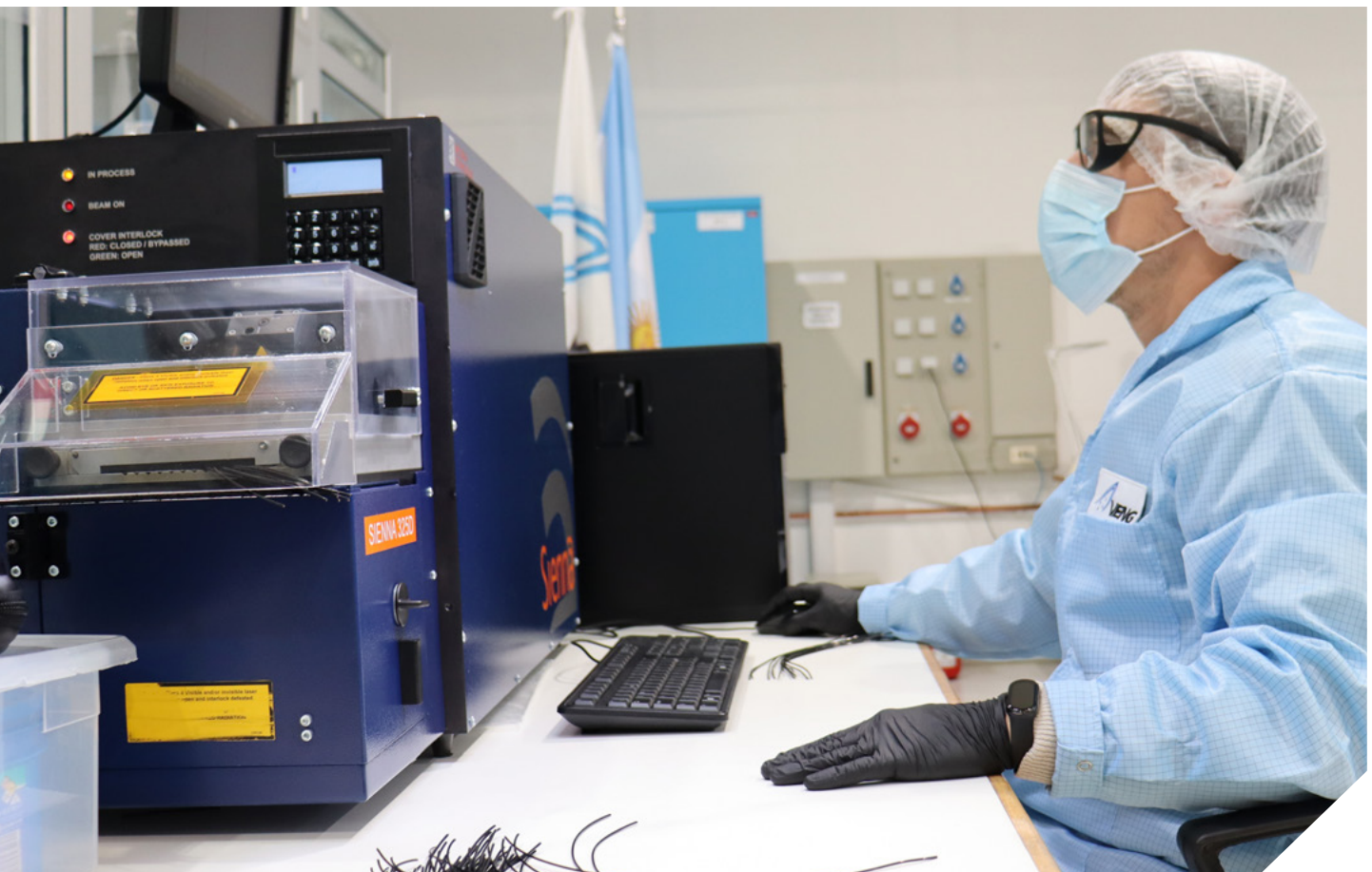
- Aeronautics
- Space
- Oil & Gas
- Nuclear
- General Industry

Services

- Mechanical design of devices and structures associated with different industries.
- Design of thermal control systems for the aerospace industry.
- Thermal and structural analysis through computational simulation.
- Design and implementation of manufacturing, assembly and integration processes for mechanical and thermal subsystems.
- Design of test plans for verification and validation of systems.



ELECTRONICS ENGINEERING



The electronics engineering team has extensive experience in the design of satellite instrument systems and subsystems, with a primary focus on SAR missions, such as the successful SAOCOM missions and the upcoming Sabia-Sea mission. In addition, we have applied our knowledge and experience in a variety of industries, including aeronautics, petroleum and Oil & Gas, as well as projects related to radar, defense and special process automation.

For the management of our designs we adhere to the engineering standards established by ESA and NASA, adapting them to the specific needs of each project. For PCB design, we have engineers certified by IPC standards for space applications, guaranteeing excellence in every detail. We are currently in the process of obtaining ISO 9001 certification, which is expected to be completed by the end of 2024.

As for our tools and technologies, we work with state-of-the-art software, including LabVIEW, Altium, Feko, ANSYS and SolidWorks, among others. In addition, we have multipurpose equipment, such as NI PXI modules, which allow us to carry out functional tests and rapid tests efficiently.

Services

- Analysis, design and implementation of electronic hardware devices with commercial, industrial, military and aerospace quality.
- Specialized design of PCBs for high reliability projects based on IPC standards, for military and/or aerospace applications.
- Analysis, design and implementation of firmware, software and embedded software for digital and high speed applications.
- Analysis, design and implementation of electronic systems for product testing.
- Research of electronic systems for implementation of custom applications.

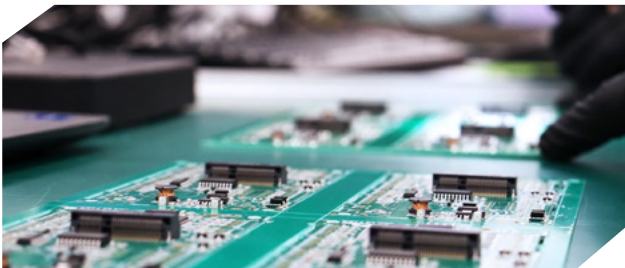
Industries

- Aeronautical-Military
- Aerospace
- Oil & Gas
- Defense
- Diverse industries (Automotive, IT, food, agriculture, etc.)



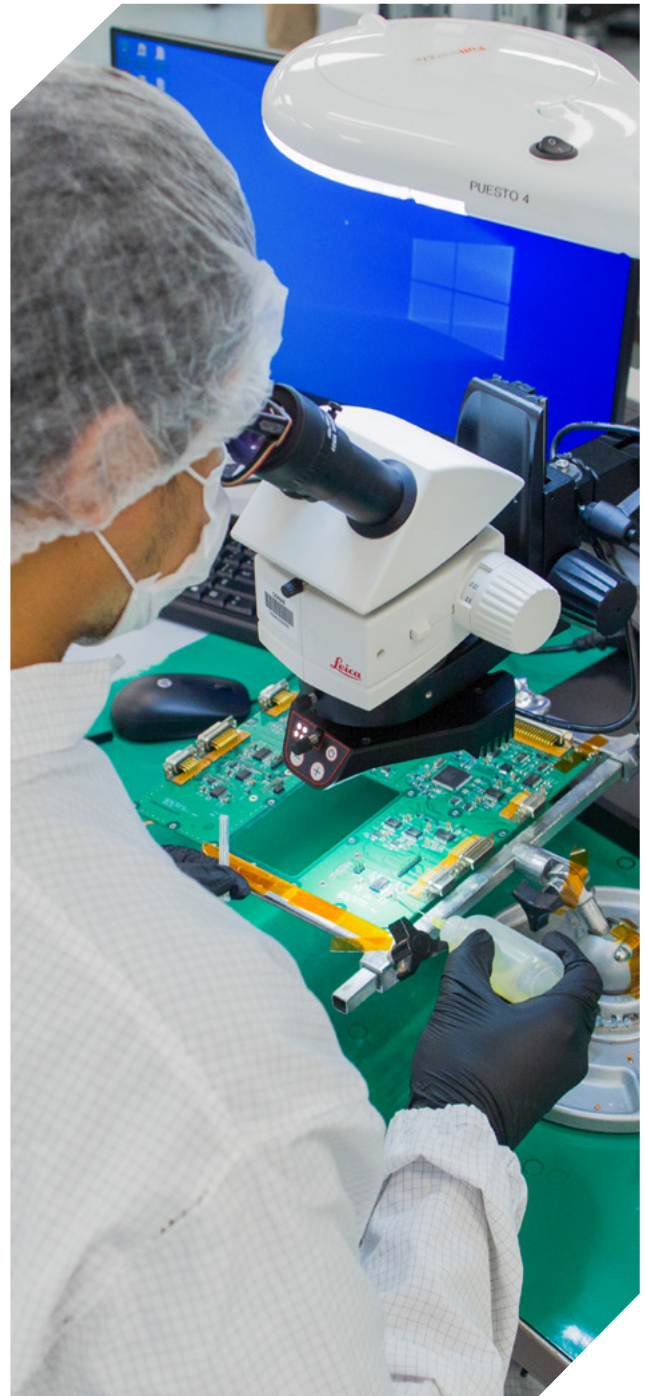
SURFACE-MOUNT TECHNOLOGY (SMT)

We offer a high quality electronic board assembly service, suitable for both industrial and space applications. We are guided by IPC standards, from industrial standards IPC-A-610 and IPC-J-STD-001 to the most stringent space requirements.



We have automated SMT technology and manual soldering technology for both surface mount and insertion, which allows us to adapt to various assembly needs. Each plate is inspected and validated to ensure durability and reliability, meeting the most demanding customer and regulatory requirements.

With high quality automated SMT (Surface-Mount Technology), we have the capacity to assemble electronic boards, adapted to the specifications of each customer and ensuring maximum durability and reliability. We use advanced machinery to achieve maximum precision and reliability in each project.



**JUKI G TITAN**

Equipped with automatic paste dispensing system for uniform and precise application.

PCB SIZE	Min. 50mm x 50mm Max. 510mm x 510 mm
-----------------	---

ADJUSTABLE INSOLE FRAME SIZE	Min. 470 x 370mm Max. 737 x 737mm
---	--------------------------------------

PUNE HEIGHT	0.4mm to 6mm.
--------------------	---------------

**VAC745**

Vapor-phase soldering machine with a specialized vacuum system to remove porosities from the solder. This system significantly improves reliability by eliminating air bubbles and ensuring homogeneous heat distribution, ideal for sensitive components and complex assemblies.

**JUKI RS-1R**

Capable of placing up to 50,000 components per hour, equipped with an adaptable 8-nozzle placement head, allowing fast and accurate assembly of various components.

One LNC-120 multi-nozzle 3D laser alignment system with eight nozzles

PUNE HEIGHT	1mm, 6mm, 12mm, 20mm, 25mm
--------------------	-------------------------------

PCB SIZE	370mm W x 650mm L (Max)
-----------------	----------------------------

PCB SIZE	600 x 500 mm
-----------------	--------------

DOBLE LAYER

Leaded and lead-free soldering capability



Manual welding and aerospace quality inspections

CAPABILITIES

- Electronic Manufacturing Engineering
- PCB design review, for implementation of inspections and workmanship requirements
- Manual SMD Soldering and Insertion

INSPECCIONES

- Visual Inspection
- RX Inspection
- Solderability Test

REFERENCE STANDARDS

- IPC 610, J-STD- 001, IPC 620, IPC 7721/11, IPC A 600
- J-STD-001 Spatial Appendix
- IPC 620 Spatial Appendix
- ECSS-Q-ST-70-08, ECSS-Q-ST-38, ECSS-Q-ST-70-61

SPECIAL MACHINING

Vertical CNC Lathe

**LYMCO RAL-12M**

DISTANCE BETWEEN ENDS	1250mm
------------------------------	--------

MAXIMUM TURNING DIAMETER	1250mm
---------------------------------	--------

MACHINABLE HEIGHT	1500mm
--------------------------	--------

MACHINABLE DIAMETER	1500mm
----------------------------	--------

MAX. WEIGHT	6 Tn
--------------------	------

AXIS Z	900mm
---------------	-------

**LYMCO DV-3000MT**

BED DIAMETER	3000mm
---------------------	--------

CONE	BT 50
-------------	-------

PROGRAMMABLE DIVIDING CHUCK	0° — 360°
------------------------------------	-----------

MAX. MACHINABLE DIAMETER	3400mm
---------------------------------	--------

MAX. MACHINABLE HEIGHT	2000mm
-------------------------------	--------

MAX. WEIGHT	22.000kg
--------------------	----------

FIXED TOOL POST	90°
------------------------	-----

DIVIDING TOOL POST	0° — 90°
---------------------------	----------





Horizontal CNC lathe



ACRA FEL 6080 CN

DISTANCE BETWEEN ENDS	2250mm
------------------------------	--------

MAX. Ø ADMISSIBLE ON BEDPLATE	1500mm
--------------------------------------	--------

Wire cut machine



AGIE CHARMILLES CUT 30P

U-V =	+/- 50mm
--------------	----------

WORKING VOLUME	1030x800x350mm
-----------------------	----------------

MAX WEIGHT	1 Tn.
-------------------	-------

X AXIS	600mm
---------------	-------

Y AXIS	400mm
---------------	-------

Z AXIS	350mm
---------------	-------

Electro-Erosion Machine



AGIE CHARMILLES FORM 30

WORKING VOLUME	1200x800x500mm
-----------------------	----------------

MAX. WEIGHT	1 Tn.
--------------------	-------

MAX ELECTRODE WEIGHT	100 Kg.
-----------------------------	---------

X AXIS	600mm
---------------	-------

Y AXIS	400mm
---------------	-------

Z AXIS	400mm
---------------	-------

CNC milling center

**HAAS VM6**

BED DIMENTIONS	L1626mm x 813mm
MAX. HEIGHT	762 y 300 mm
MAX POWER	30 Hp
MAX SPEED	12000 rpm
MAX WEIGHT	1814kg
CONE	BT40

**HAAS VF3YT**

BED DIMENTIONS	L1372mm x 635mm
MAX. HEIGHT	749mm
MAX POWER	30 Hp
MAX SPEED	8100 rpm
MAX WEIGHT	1588k
CONE	BT40



SPECIAL WELDING: FRICTION STIR WELDING CENTER (FSWC)



A solid-state welding process where a non-consumable tool is used to join two parts without melting the part material. This allows very high joint efficiencies to be achieved in alloys where conventional welding (melting) degrades the mecha-

nical properties by a high percentage. Friction stir welding is therefore widely used in the space, naval and military industries to weld mainly aluminum alloys.



MANUFACTURER	Nova Tech Engineering Inc.	THICKNESS	2,4 mm – 13 mm
GEOMETRY	Longitudinal, circumferential welds	WELDING LENGTH	2600 mm (max)
JOINTS	Stopper, Overlapped	TOOL RPM	5 rpm – 2000 rpm
MATERIALS	Aluminum alloys	MAXIMUM LOAD	53400 N
		MAXIMUM TORQUE	450 Nm

Automatic GTAW Welding Machine // AMI M415



OUTPUT CURRENT RANGE	5A – 400A
CURRENT TYPE	Continuous or Pulsed Direct Polarity
AUTOMATIC ARC CONTROL	5VDC – 25VDC

WELDING HEAD - AMI MODEL 15

CONTRIBUTION FEED RATE	5 – 200rpm
TRANSFER SPEED	0,1 – 20rpm

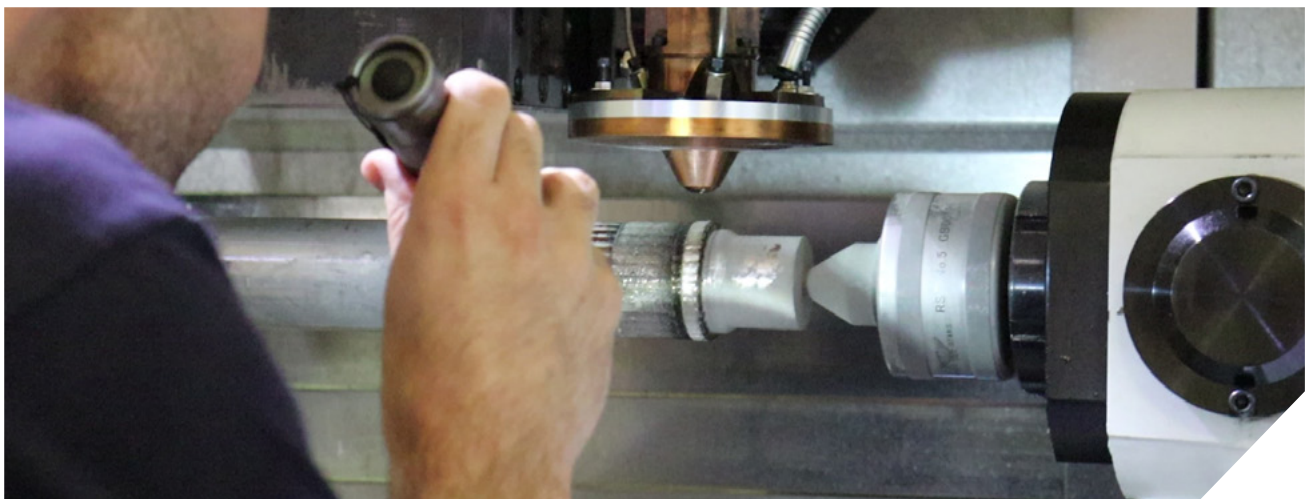
DEVELOPMENT OF ADDITIVE MANUFACTURING PRODUCTS

Additive manufacturing services, ranging from state of the art 3D metal printing (DMD) to electroplating facilities. This state of the art manufacturing service allows as to develop complex metal components with a high manufacturing efficiency.

3D DMD Additive



MAX. DIAMETER	650 mm
MAX. LENGHT	112 g
STANDARD SPINDLE SPEED	4.200 [3.000] rpm



CARBON FIBER WINDINGS



Design services and winding of composite materials. With the capacity to manufacture large pieces, of about 1500 mm in diameter and 9000 mm in length, with optimal mechanical vs weight performance.

Racks for gas storage

These RACKS provide a solution to contain and transport 18 to 36 kg of H₂ at ambient temperature, storing the gas at a pressure of 400 bar.



SPECIAL HEAT TREATMENTS



High quality Brazing and Heat Treatment services in controlled atmosphere and high vacuum environment. This service ensures space industry grade quality mechanical properties and surface finish.

Services

Non-conventional welding process. Brazing	High temperature (1370°C) and high vacuum (1×10^{-6} mbar) furnace	Work in controlled atmosphere (NG2) or vacuum
Customized temperature profiles for different heat treatments		Process monitoring and post-processing of data

Vertical vacuum furnace

TAV V12

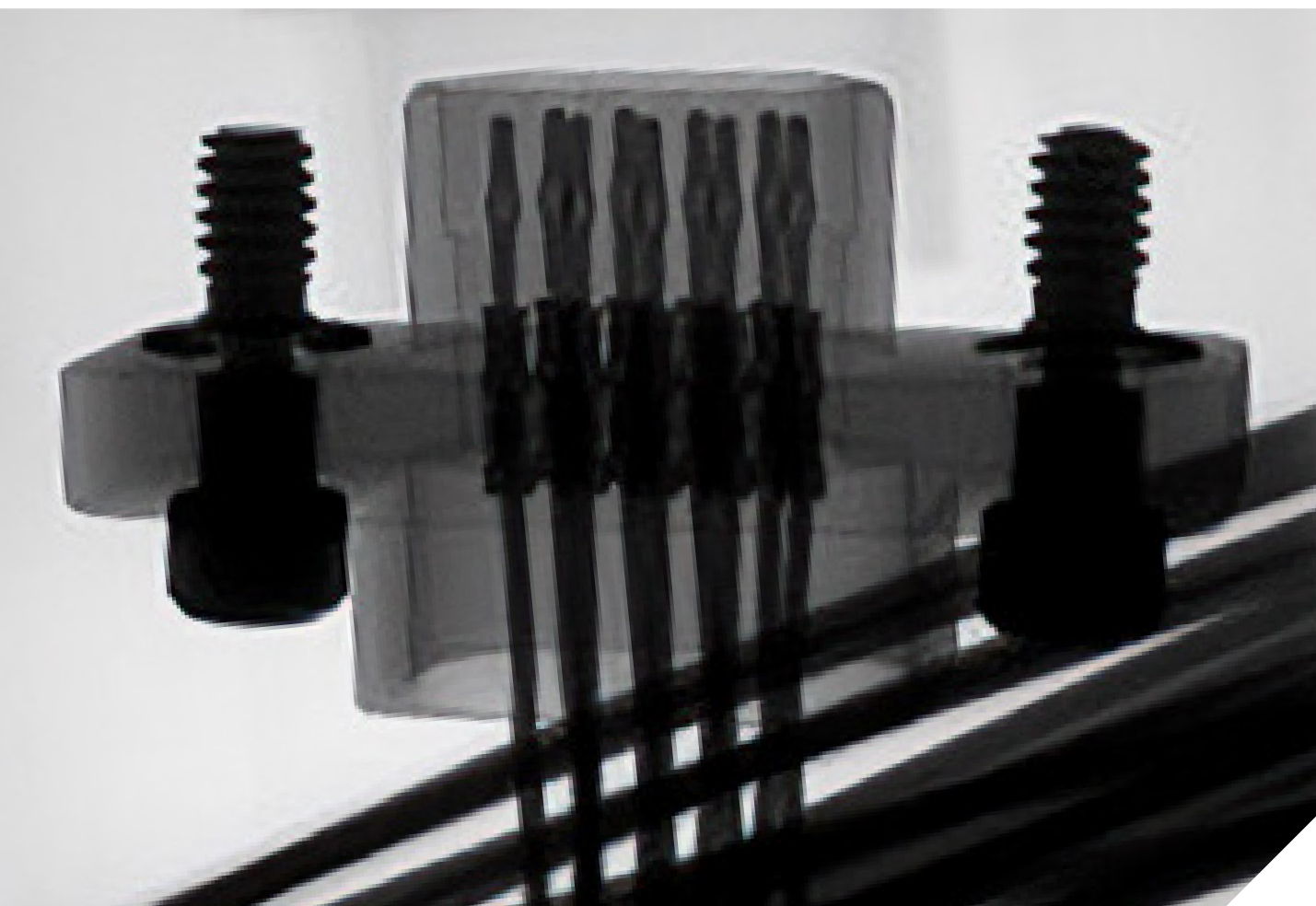
CHAMBER DIAMETER	1200mm
HEIGHT	1500mm
WEIGHT CAPACITY	1500kg
MAX. TEMPERATURE	1370°C
VACUUM PRECISION	±5°C. Vacuum 5 x10 ⁻⁶ mBar
PROTECTIVE GAS SHIELD	N 6,5 Bar
HEATING POWER	260 KW



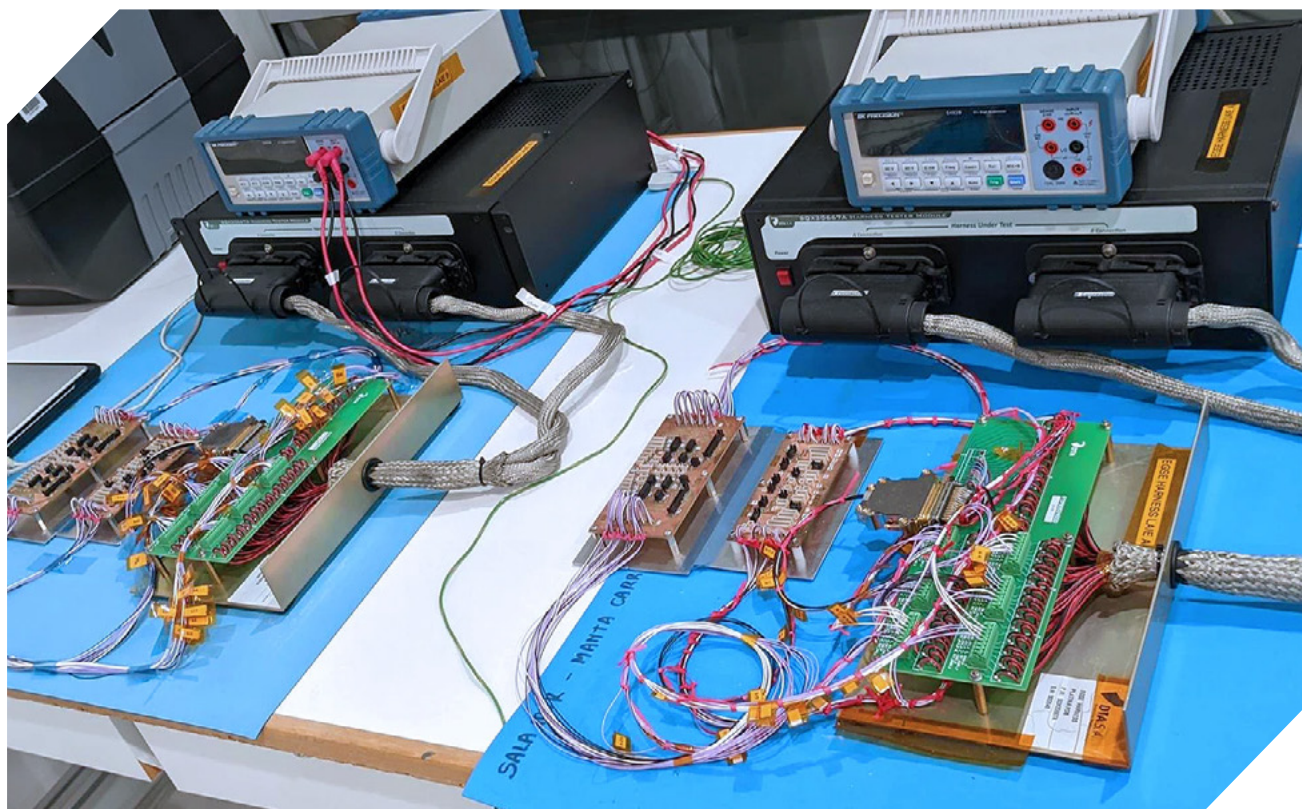
HARNESS

We are a leading company in manufacture of harnesses for Power, Radiofrequency and Control applications. Several of our productions are supplying satellites with excellent results, as we have developed high-quality solutions for projects of national importance, such as SAOCOM and SABIA-Mar from CONAE, as well as for private customers looking for reliable and efficient results.

Our team of highly trained professionals, working together with the Quality area of the company under ECSS and IPC standards, uses advanced technologies and top-quality materials to guarantee the reliability and efficiency of all our products. We manufacture by welding and crimping, and we have different cable stripping methods: mechanical, thermal and laser, which adapt to all types of cables and sheaths.



We strive to deliver superior quality results to our clients, so we maintain our focus on innovation and continuous improvement, to offer products that meet your expectations.



We also have equipment and processes to carry out pull tests that guarantee the integrity of the batches according to requirements, and we can offer RX images as a complement to the manufacturing reports, including continuity and isolation test using specific EGSEs. Everything can be developed in our ISO 7 or ISO 8 Clean Rooms, as well as we can manage RF test in our Anechoic Chambers.



www.veng.com.ar

 [veng-argentina](#)

 [veng_argentina](#)

 [veng_argentina](#)

Commercial Contact

sales@veng.com.ar

Institutional Relations

relaciones.institucionales@veng.com.ar