Allegato 1

IRIDIUM & ARGOS services for OGS/University of Parthenope

To the attention of

Istituto Nazionale di Oceanografia e di Geofisica Sperimentale - OGS
Centro Gestione Infrastrutture Navali – CGN
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Limited distribution/Diffusion limitée

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CHRONOLOGY ISSUES

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3	05/11/2024	CLS-ENV-PC-24-0621 – V3	S. Routaboul
4	28/11/2025	CLS-ENV-PC-24-0621 – V4	S. Routaboul

INFORMATION ON THE OFFER

Type of sale	Type of service	Activity code	Technology code
Service	IRIDIUM RUDICS & ARGOS services	Oceanography	IRIDIUM

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1. List of Contents

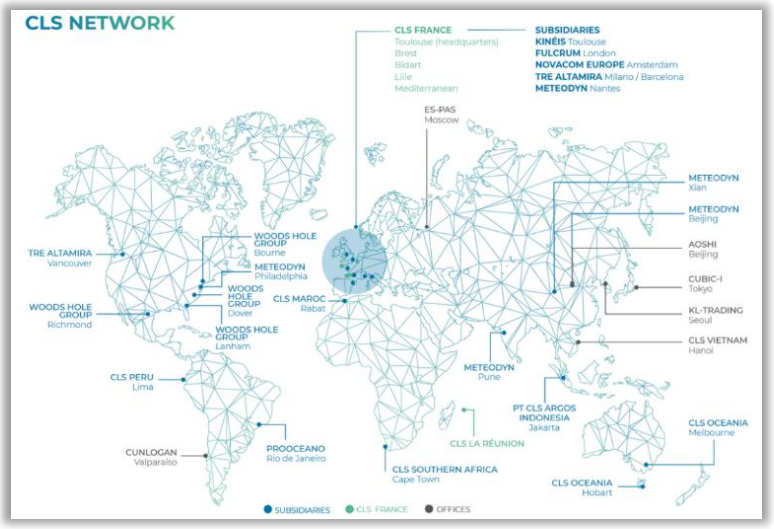
2. CLS profile

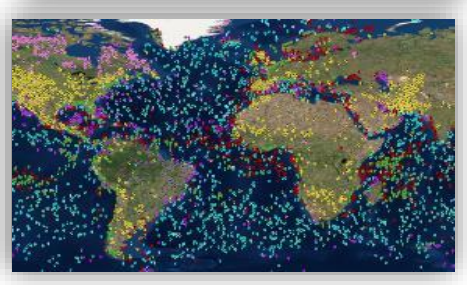
Collecte Localisation Satellite – CLS – is a subsidiary of CNES (French Space Agency) and CNP. We have been operating satellite systems and providing **high value-added products and services since 1986.**

CLS is a worldwide **leader** in providing space-based solutions for environmental applications.

Working with the operational ocean & wildlife tracking community for over 30 years, CLS is also operating a full set of in-situ data collection and Earth observation satellite services for Hydrology & Agriculture, Soil & Air monitoring,

We are now a group of **900+ employees** with headquarters in Toulouse in France and an international network of **34 offices.**





CLS provides **2 global coverage** satellite systems services:

- **ARGOS – legacy & Kinéis**
- **Iridium**

With **2 processing centers** operated and **monitored 24/7**, CLS is receiving, processing, validating, distributing, and archiving data from these both satellite systems, everywhere on Earth.

CLS currently tracks more than **100,000 platforms** each day and is the partner of choice for all environmental projects that rely on satellite telemetry, with highly trained customer support and unmatched expertise in this field.

Operational excellence

- ✓ **2 redundant** processing centers, **operated 24/7**,
- ✓ More than **40 years of experience** in the operational ARGOS telemetry community
- ✓ More than **100 000 platforms tracked** worldwide by CLS satellite systems

CLS Experience

- ✓ CLS is dealing with the worldwide oceanographic community since 1986. We have gathered a huge experience in term of operational practices, satellite data processing, archiving and all related data exchanges.
- ✓ CLS is **ISO 9001 certified** and applies quality management to all its activities, including those with suppliers.

3. Technical proposal

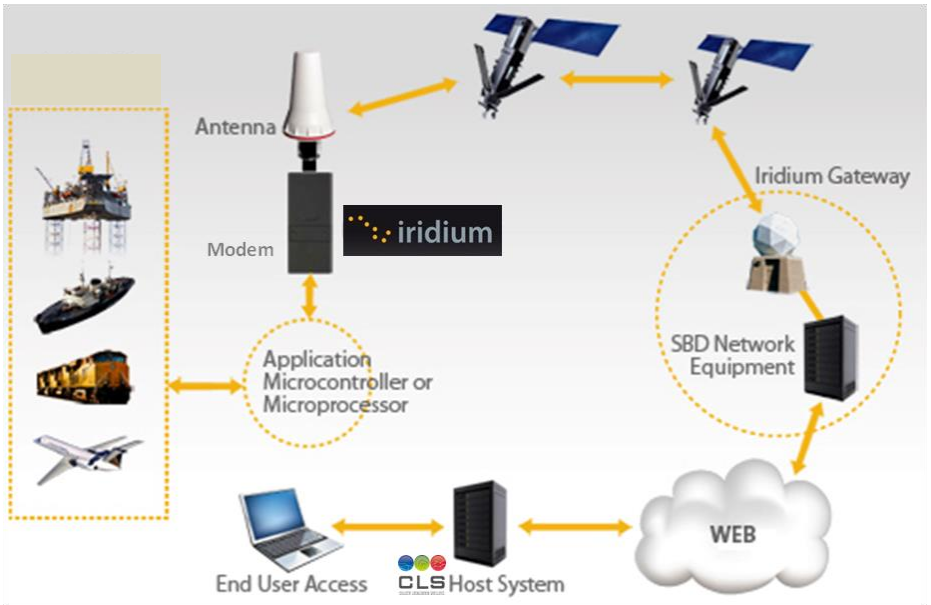
3.1. Iridium system

With 66 Low Earth Orbit satellites, Iridium is the world's largest commercial satellite constellation.

This global mobile satellite communications system, with voice and data solutions is owned by the Iridium Communications Inc. Company (McLean, VA, United States). The Iridium System is a satellite-based, wireless communications network providing a robust suite of data services to virtually any destination anywhere on earth. Its three principal components are: the satellite network, the ground network and the Iridium subscriber products including ocean platforms fitted with Iridium modems.

The Iridium constellation

The design of the Iridium network allows data to be routed virtually anywhere in the world. Data calls are relayed from one satellite to another until they reach the satellite above the Iridium Subscriber Unit and the signal is relayed back to Earth. Gateways are the terrestrial infrastructure that provides interconnection to the terrestrial data networks. Gateways also provide network management functions for their own network elements and links.



Iridium System Overview

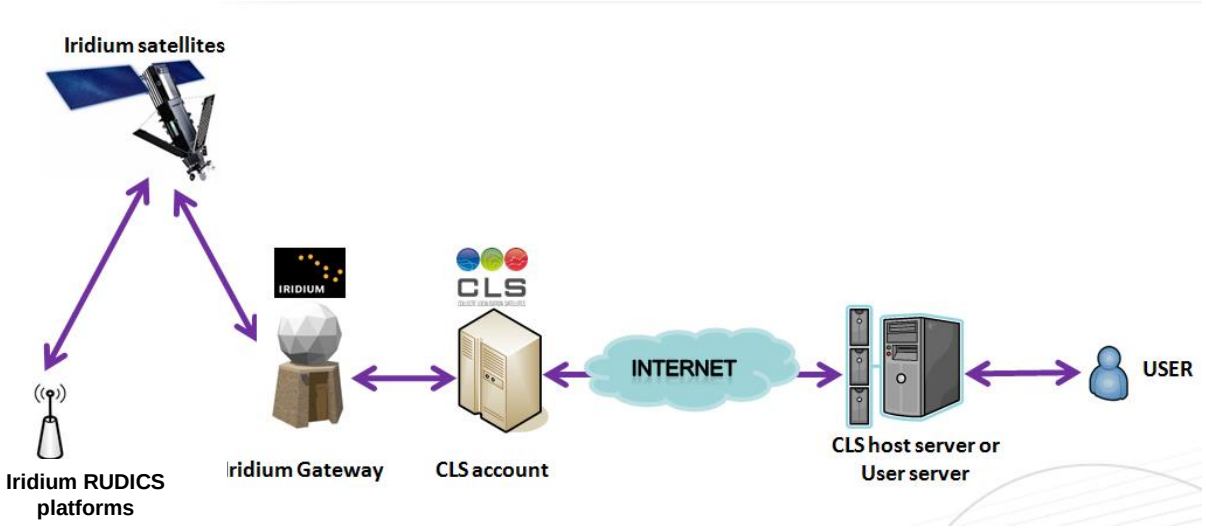
3.1.1 CLS Iridium RUDICS Service

The Iridium Router-Based Unrestricted Digital Interworking Connectivity Solution (RUDICS) is an enhanced gateway termination/origination capability for circuit-switched data calls across the Iridium satellite network. **RUDICS is a circuit switched data service designed to be incorporated into an integrated data solution, such as remote asset monitoring, control and data file transfer.**

RUDICS uses circuit switched data service. The difference and key benefit come in the equipment that is used to terminate or originate the call in the Iridium Gateway. RUDICS uses routers to allow termination and origination of circuit switched data calls to and from a specific IP address over the Internet. The capability is designed to support applications that have many field devices and one central host application. The service allows field devices to directly call the host application and the host application is able to directly call the field devices.

RUDICS is typically best suited for applications that deploy large number of units which report to a central host application. Some Iridium RUDICS applications switch automatically on CSD protocol when the RUDICS service is not accessible.

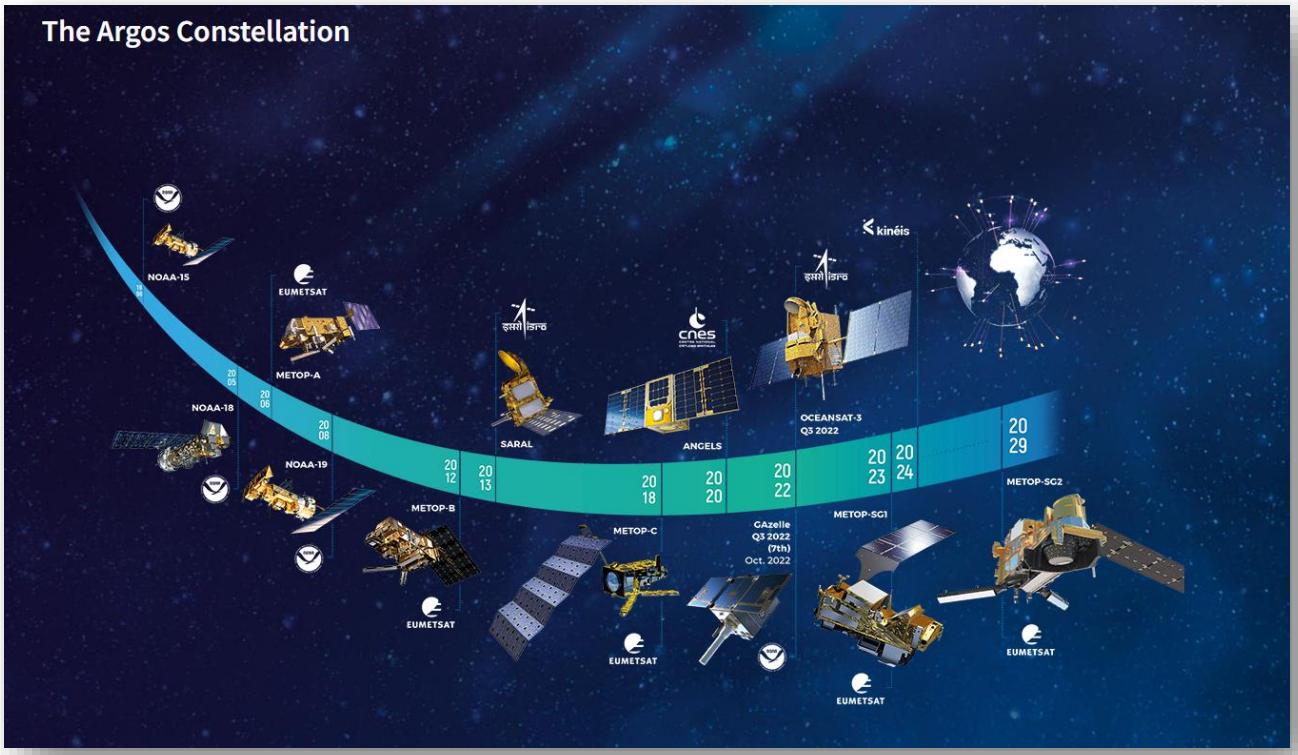
First, field application calls a custom RUDICS server number. The call request is routed over the constellation to the Gateway with user authentication and call set up. Switch connects to RUDICS server on the CLS account, secondary authentication conducted. RUDICS server terminates call to the user server. End to end IP connection established over the constellation between the host application on the user server and field application.



The Iridium RUDICS communication service at CLS

3.2. ARGOS system

ARGOS is a global, satellite-based data collection and positioning system, dedicated to studying and protecting the earth's environment and is governed through a partnership between NOAA, NASA, CNES, ISRO and EUMETSAT.



Since the beginning, the ARGOS system has continued to improve in order to better meet the needs of our users, in particular through the regular launch of new satellites.

Currently, the ARGOS satellite system has the following characteristics :

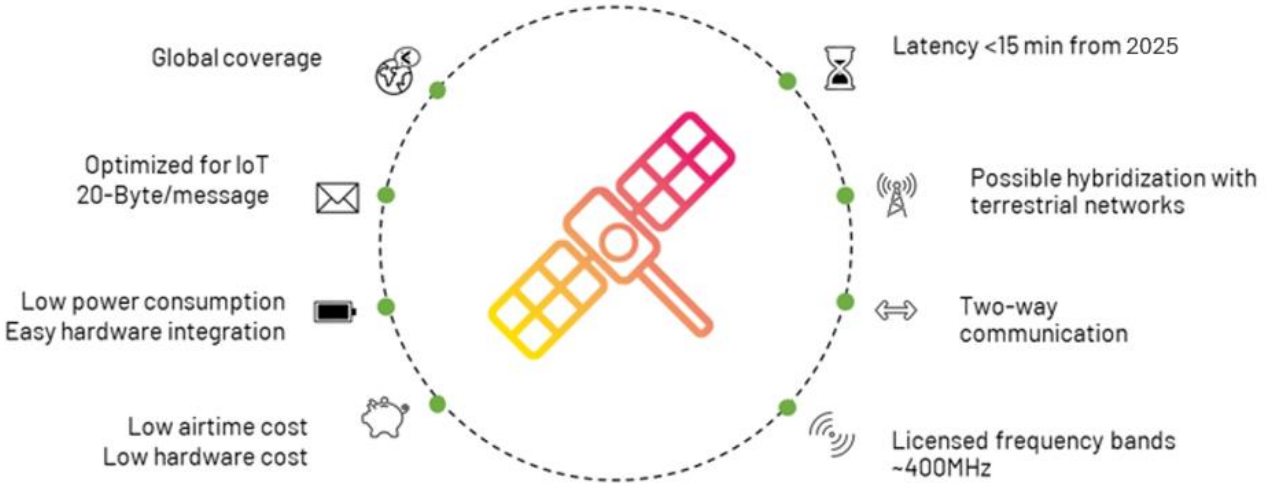
- ✓ Global coverage
- ✓ 8 operational satellites
- ✓ From 4 Kbytes to 12 Kbytes of data can be transmitted daily, per plateform
- ✓ Low transmission power (from 250mW to 1W)
- ✓ DOPPLER positioning :
  - GPS-free positioning system
  - Accuracy up to 250 m

3.2.1 Kinéis constellation

Kinéis, created in 2019 by CLS and CNES, fully funded, is launching a new constellation of 25 nanosatellites, which will be put into orbit and should be operational end of 2025 (the first 10 nanosats have been launched on June and September 2024).

This constellation, with full ARGOS compatibility as well as retro-compatibility with all generations of ARGOS platforms, will therefore complement and improve the current ARGOS satellite system.

- ✓ Better revisit time – max 15 min
- ✓ More data to be transmitted
- ✓ Full & global two-way communications
- ✓ Low consumption – down to 100mW
- ✓ Electric propulsion – for reliability & durability improvement
- ✓ Multi beam antennas



Thus, thanks to Kinéis and its nanosatellites, a new era is beginning in satellite telemetry solutions for low power and low-cost systems.

4 Commercial proposal

4.1 Iridium RUDICS service price for 1 glider

IRIDIUM RUDICS Services	Unit price excl. VAT
Service subscription per Iridium RUDICS SIM card, fee per month	26.00 €
Iridium RUDICS data calls (20s increments) fee per min	0.88 €

OGS, with the collaboration the University of Parthenope, will use an ALSEAMAR glider for 12 months.

The IRIDIUM RUDICS service cost estimation for 1 glider for 12 months of use is **1 632 €**

- Monthly fee : 26€ x 1 glider x 12 months = 312,00 €
- RUDICS minute fee : 1500 min x 0.88€ = 1 320 €
  TOTAL = **1 632 €**

Please note that the invoice is based on the real consumption.

4.2 ARGOS service for 3 platforms (ID numbers : 223732, 223733 and 198952)

As an indication, the pricing for the ARGOS basic service is as follows for a public establishment

- 17,00 € (monthly fee for each active platform)

+

- 4,00 €/day (daily fee as soon as there is one transmission per day)

→ capping at 12d **(if no transmission in a given month = no charge).** A 12-day cap is applied to all platforms, allowing **unlimited monthly usage** of 65.00 €/platform (17.00 € + 12 days x 4.00 €).

Thus, the ARGOS service cost is **2 340€ for 3 platforms for 12 months of unlimited use**.

Please note that the invoice is based on the real consumption.

5 Invoicing period and payment terms

- ✓ **Validity**: this proposal remains valid until 31/12/2024.
- ✓ All prices are indicative and subject to modification according to technical needs
- ✓ **All prices are exclusive of VAT**
- ✓ **Payment Terms**
    - Service - Bi-monthly invoice payable within 30 days of receipt of invoice
- ✓ **CLS General Conditions and Clauses** applicable to sales of services and equipment apply.
- ✓ CLS services could be stopped at any time during working days upon user request, with one month notice
- ✓ CLS is **ISO 9001 certified** and applies quality management to all its activities, including those with suppliers.