



The Polymath Company  
ENGINEERING YOUR CHALLENGES

# Engineering Services Harsh Environment

Consultancy & Advisory

JUN 2025

# Who We are

- Founded in 2018
- Offices in Stavanger and Rep. in Paris
- 1 Sister Company in Tunis for Offshoring and MEA clients
- 25+ Clients in 4 Continents
- We harness the power of Disciplined Multidisciplinary Expertise and Process-oriented Systems Engineering to support customers in their journey of engineering complex products and services for harsh and complex environments.
- We believe that **knowledge** should be shared across industries from Space to Downhole and that's why we are trusted by:



# Services & Expertise

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→ Our expertise covers the following technical fields :

- \* Mechatronics for harsh and extreme environments (Extreme temperatures, Shocks & Vibrations, Pressure, Vacuum, Radiation)
- \* Systems Engineering (requirements analysis, architecture, lifecycle, process definition and implementation ...)
- \* Design Thinking, System Analysis, Simulation ...
- \* Complex Systems Engineering & Prototyping (Electronics, Power, FW/SW, Batteries, High Voltage, Mechatronics, V&V ...)
- \* Complex Systems Industrialization & Ruggedization (Space, Downhole Oil&Gas, Aerospace)
- \* Project Management – Strategy (Startups)





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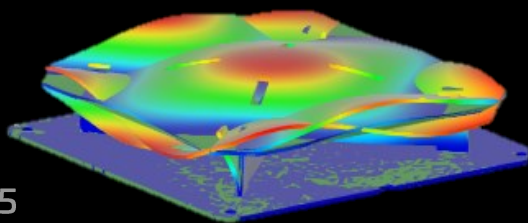
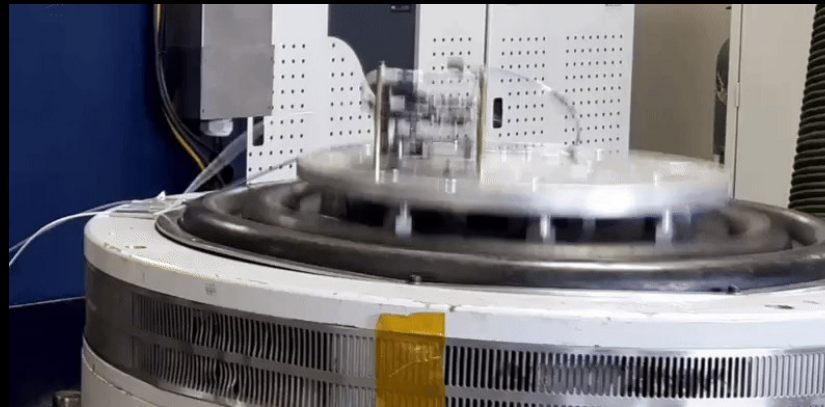
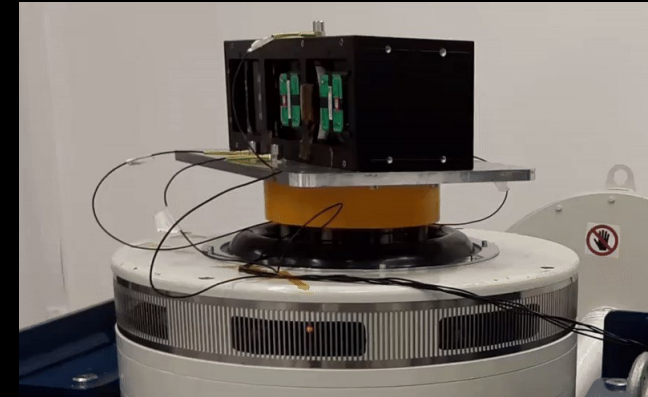
# HE Projects Portfolio

Harsh Environment Complex Systems

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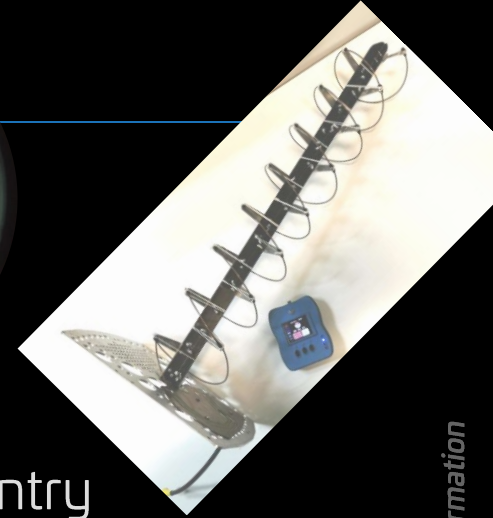
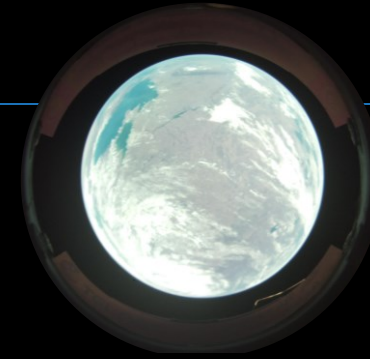
# Space

- ➔ Mission Design & Systems Engineering
- ➔ Bus & Platform Design & Improvement
- ➔ Payload Design
- ➔ Ruggedization
- ➔ Testing & Qualification



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# Project Sample

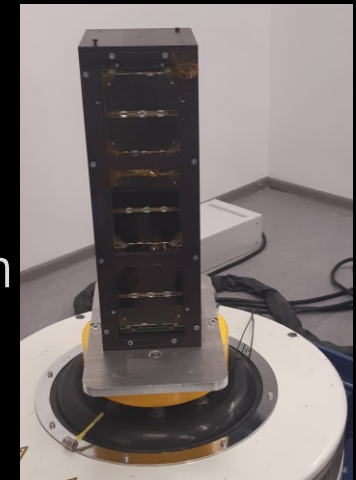


## → *IoT Nanosatellite*

- \* Advisory on mission planning & project management
- \* Knowledge transfer to launch first satellite / space project in a client's country
- \* Design Review, Improvement, Integration, Qualification and Deployment (Payloads & FM)

## → *3U Nanosatellite Bus Improvement*

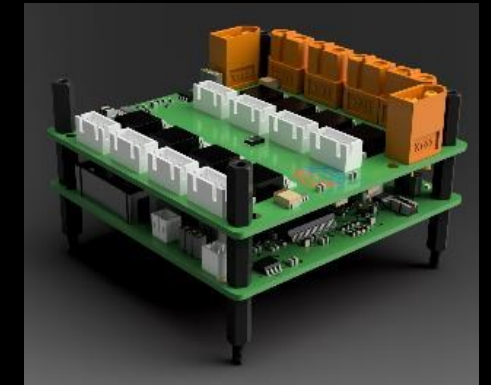
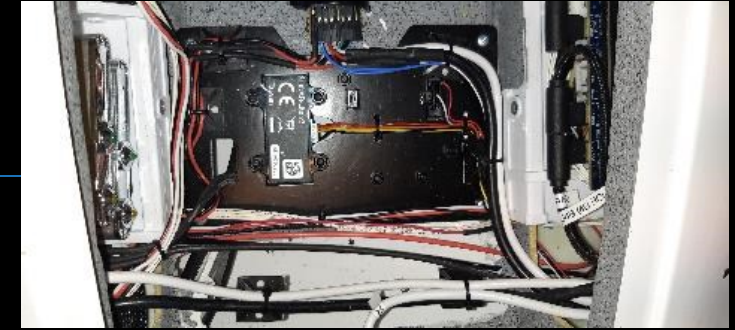
- \* Review of Mechanical and Electrical Design
- \* RF and Mechanical improvements for seamless testing and integration
- \* Acceptance Test process definition and implementation





# Unmanned – UAV/UGV/USV

- ➔ Mission Design & Systems Engineering
- ➔ Platform Design & Improvement
- ➔ Power Unit, Controller Unit Design
- ➔ Payload Integration & Design
- ➔ Ruggedization
- ➔ Testing & Qualification



Confidential Information

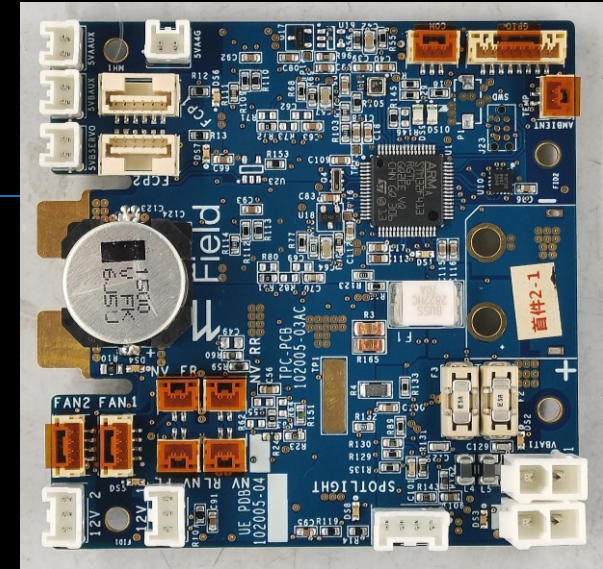
# Project Sample

## → *Firefighting UGV*

- \* Advisory on technology for electronics & payloads
- \* Battery Technology advisory and implementation
- \* Ruggedization

## → *All Weather Inspection UAV*

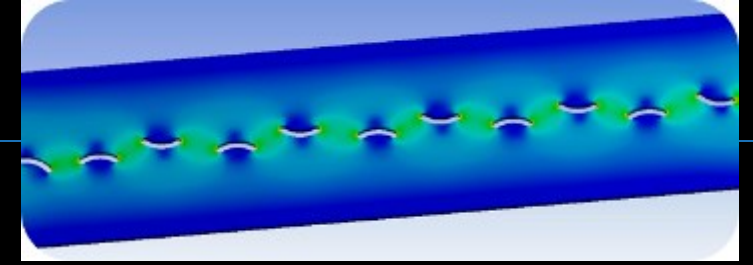
- \* Electrical design for Power Distribution and Environmental Monitoring Boards
- \* Power Lighting Design & Implementation
- \* Integration and Manufacturing Advisory





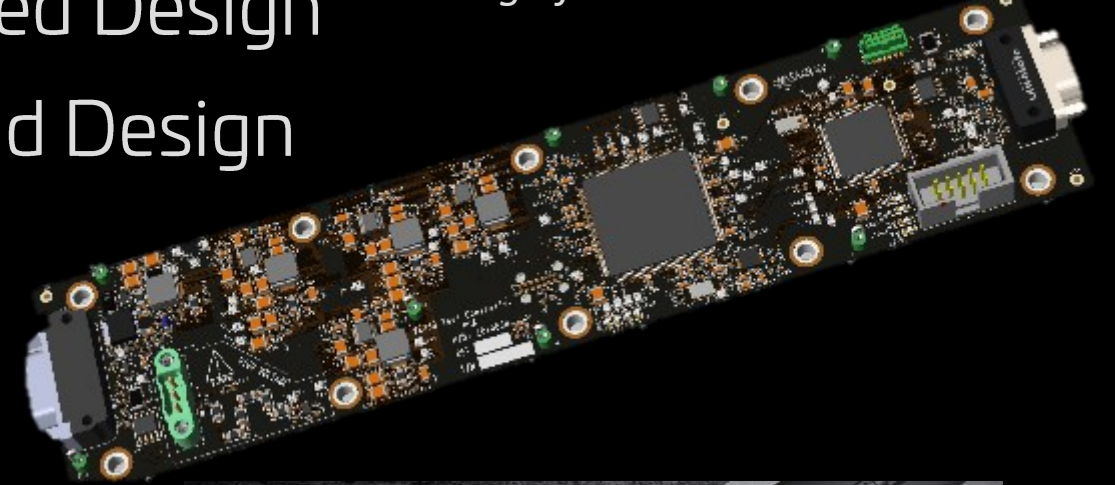
# Downhole

High Voltage PCBA Design, simulation & Testing (30kV per PCB up to 175°C)



Digital & Analog & Power Electronics design for harsh environments

- Systems Engineering & Project Management
- Electronics & Mechatronics Rugged Design
- Analogue Measurement Front End Design
- Testing & Qualification
- Field & Operations Support



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Roll, Hot Roll, S&V, HALT testing and ruggedization of designs & systems



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# Other Industries

## → *Medical*

- \* Heavy Duty, wide operating conditions and user-friendly diagnostic research device deployed in 7 COVID centers with 2500+ patients and 10k+ tests done in 18 months
- \* Medical Research protocol co-development and implementation
- \* Manufacturing, Operation Support and Maintenance

## → *Lithium Battery Energy Storage Systems*

- \* Mechanical, Electronics and Electrical Design
- \* Mass volume production
- \* Ruggedization and Fire suppression systems designs



# Main Partners & their Services

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→ To strengthen our offering, we provide the following services with great partners that we trust and believe that they complement our expertise with their own at the best quality of services:

- \* ARMECH SOLUTIONS : UK based technology consultancy firm offering harsh environment mechanical design (FEA, CFD, CAD, hydraulic) and prototyping, with focus on O&G.
- \* HUGG : Norway based technology consultancy firm offering extensive mechanical design expertise (Product Development, FEA, CFD, CAD)
- \* PaleBlue : Stavanger based XR/VR/Screen based simulation & training solutions across industries. Leading XR/VR provider for NASA and ESA
- \* DENPAFLUX : Munich based EMC/EMI experts with AI powered simulation and evaluation on PCBA and Assemblies and large Systems





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