A.I. ZERØ CALIBER

Company Presentation

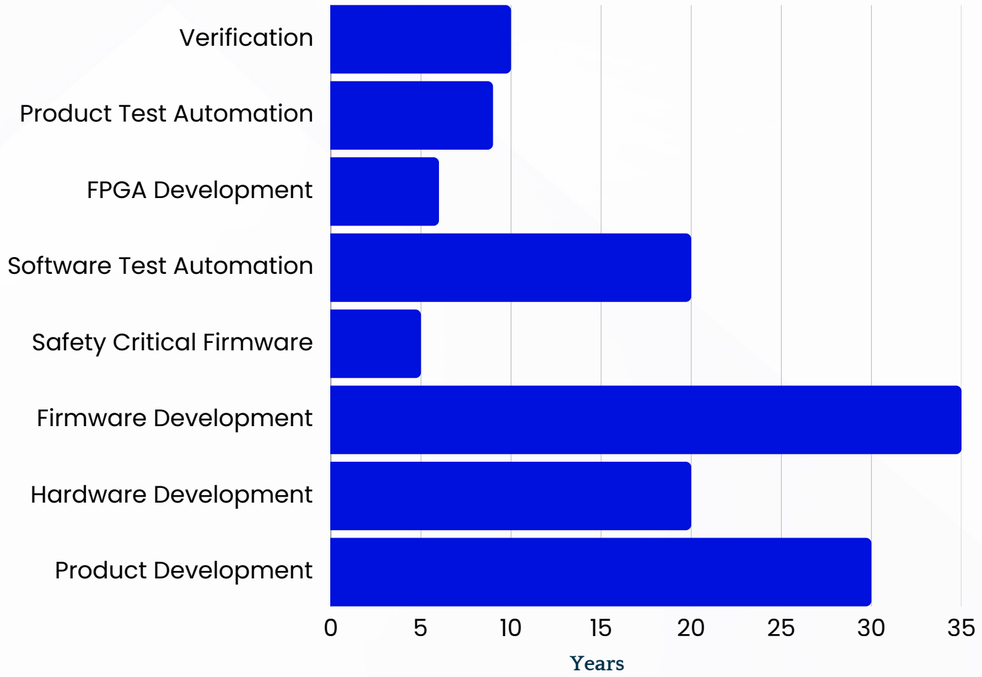
A.I. ZERO CALIBER

Contents

Company Overview

Domains:

- Embedded Systems / Safety critical
- Hardware Design
- FPGAs, Hardware Acceleration
- Wired and Wireless Networking, Multiprotocol Communications
- Mechatronics and Sensing
- Performance Estimation



Domain	Notes
Product Development	Over 10 commercial/industrial products
Hardware Development	Embedded Systems and integration, schematics, PCB, hardware that is under mass production (thousands of units)
Firmware Development	Mechatronic systems, Sensing, Bare Metal, Multicore, RTOS, Drivers, Yocto Linux, IoT, DSP
Safety Critical Firmware	Next generation High Speed train brake system
Software Test Automation	Whitebox and Blackbox Testing. Test Driven Development
FPGA Development	Microprocessor interfaces, hardware acceleration
Product Test Automation	Functional and Final Testing, RF Testing
Verification	Complex systems with FPGAs, RF, Multi-System debug, IC debug

Key Staff

Alexopoulos Ilias (Director, Hardware Engineer)

- Full stack hardware development
- Firmware, Test Driven Development (TDD)
- FPGA development
- Product development
- Test automation, RF Testing & Control
- 5+ US/EU and International Patents

Industries

- Semiconductor *(Hermes Technologies [now Broadcom], Theta Semi, Atmel, MeicSI)*
- Telecom & Defense *(Intracom SA, AI Zerocaliber Ltd)*
- Lottery-Gaming *(Intralot SA, AI Zerocaliber Ltd)*
- Space *(AI Zerocaliber Ltd)*

Jerry Pylarinos (Embedded Systems Expert)

- Embedded Systems development (Full Software Development Life Cycle)
- Safety critical firmware (Rail, Automotive, Medical)
- Machine Learning and AI for Condition Based Monitoring and Maintenance
- Wireless Mesh Networks

Industries

- Defense & Space *(AI Zerocaliber Ltd)*
- Energy Metering and Telecom *(Intracom S.A.)*
- Rail and Automotive *(ASE, Knorr - Bremse Rail Systems (UK) Ltd, McLaren)*
- Commercial and IoT

Company Expertise

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Commercial

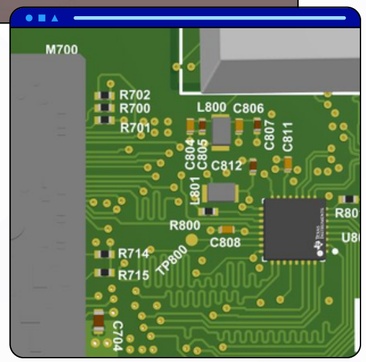
- [Commercial]: Embedded Engineering, Mechatronics (over 2500 precision high reliability systems operating in the field for 9 years, performance failure rate over the entire field 0.05%), in USA
- [Commercial]: RF Test Automations for Semiconductor Companies (RF & WiFi)
- [Defense]: UAV Control Boards for ML
- [Maritime]: 4-channel Hydrophone Array, Power Management and Data Logger
- [Research] Involved in 3 national research projects
- [Government]: Tools supporting the Immigration Dept. of Cyprus

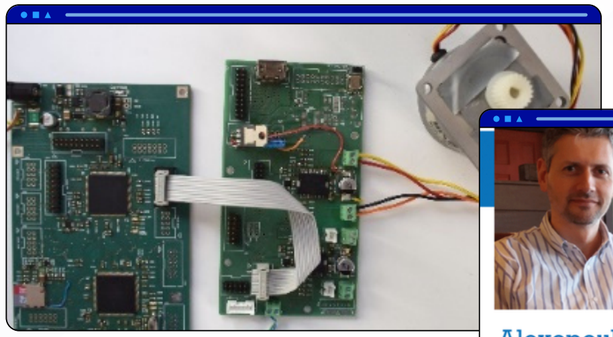
Table 6.4: Power Comparison

System	Power Consumption (W)	Improvement
Ultra96	4.4	Baseline
Raspberry Pi 4	3	32%
PCFE (1)	1.38	68%
PCFE (2)	1.2	73%
PCLE	0.84	81%

Expertise

- Hardware Design
- HDI PCBs, High-Speed Design
- Signal and Power Integrity
- FPGA Development
- Embedded Controllers, STM32, ESP32, TMS570, K66, RTOS/non-RTOS
- CAN-Open implementation, MESH Networking
- Sensing and control
- TDD and Unit Testing





Company Space-Related Experience

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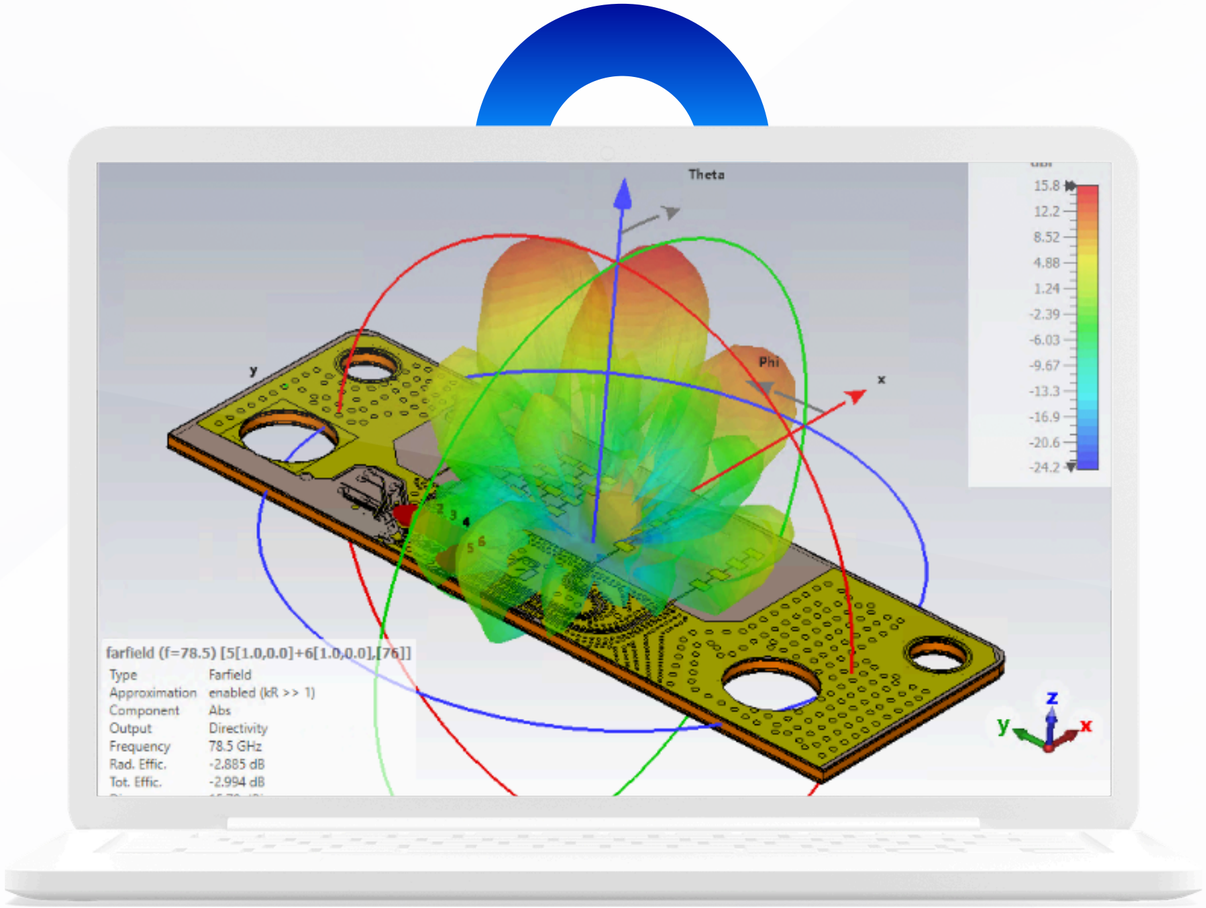
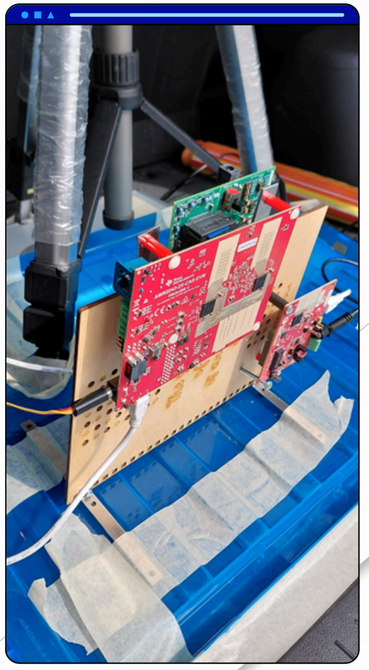


Radar System Investigation (RSI), Prime

- Rover Radar System for Navigation
- Selected as backup or short-listed component in two ITTs (GALEON, GBARD)
- Determined baseline architecture for a 4D radar

FPGA based Modulator for Space Links – External service for ESA project

- Development of the baseband DVB-S2 digital modulator
- Full Stack Development (Electronics, Embedded, PCB, FPGA)
- Hardware Design (HDI board, High-Speed, SI and PDN simulations)
- Firmware Design, CANOpen implementation



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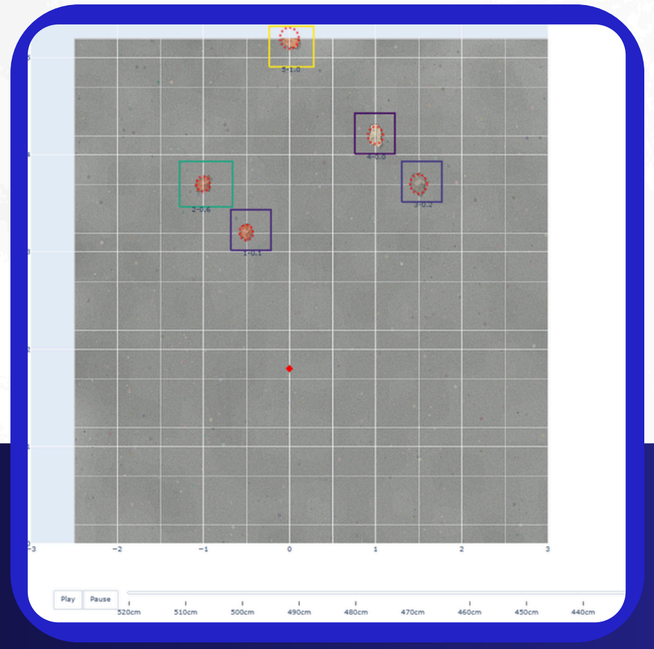
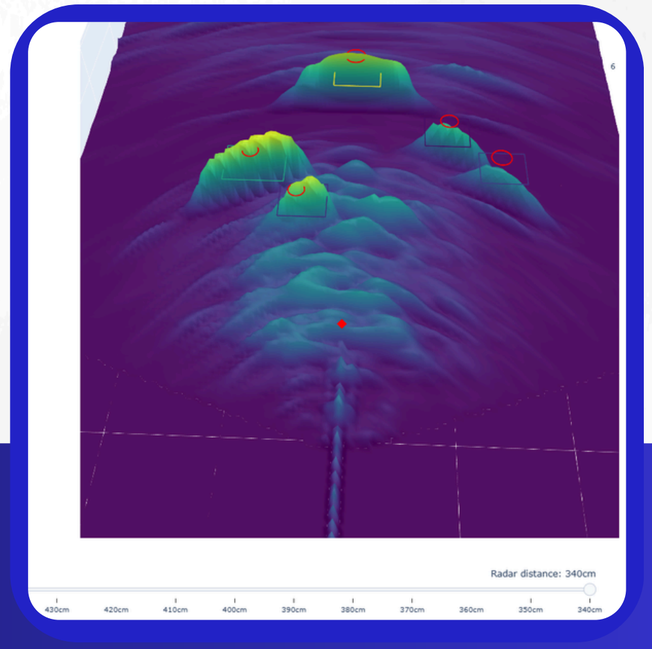
RSI Project Results





Five-rocks Setup *(10x15cm)*
No False Detections
Maximum Positional Error: <10cm

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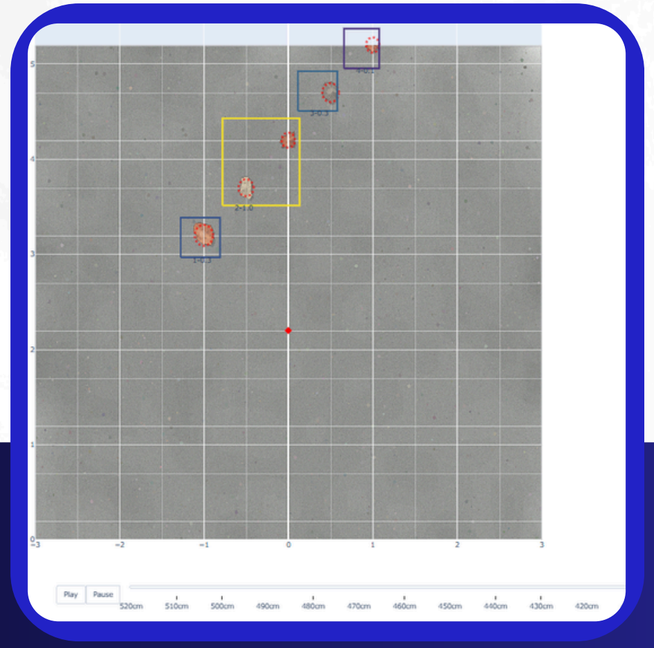
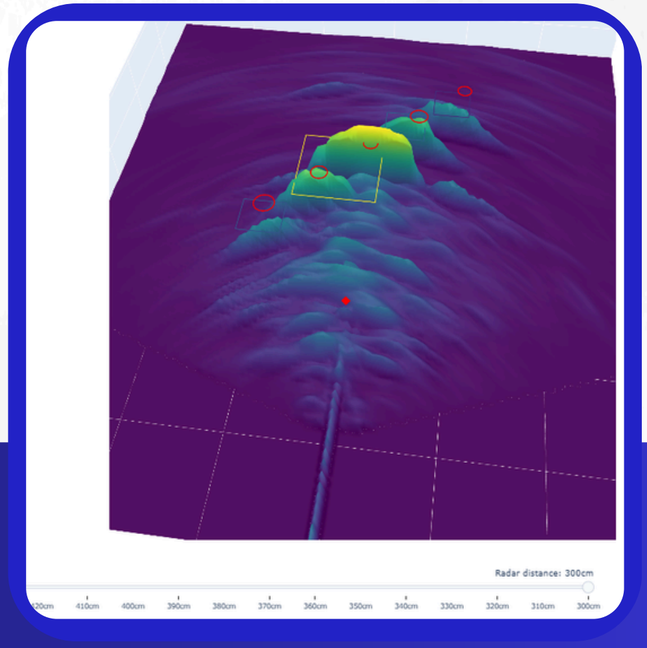
RSI Project Results





Five-rocks Setup *(10x15cm)*
All targets detected *(merging of two targets happened later)*
Maximum Positional Error: <18cm *(due to merging, initial <10cm)*

Non-Space Products

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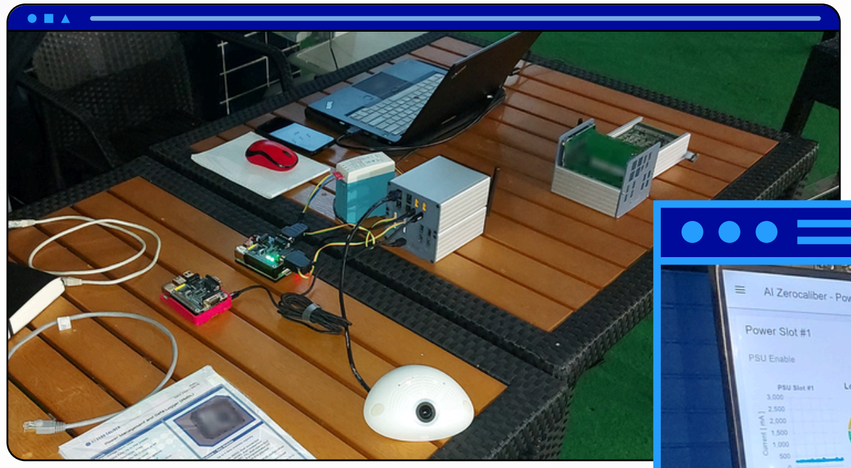
Power Management V2 (PMDL)

- Released in 2024Q4
- USV and Buoy Energy Conservation and Control



PMDL Demo

PMDL Control Dash-Board

4-Channel Hydrophone Array

- Under development
- Hardware acceleration for FFT and Cross-Correlations
- FPGA Controller Platforms (Heterogenous MCU-FPGA)

4 Channel Hydrophone

Competencies & Capabilities

Core Competencies

- Hardware Design
- FPGAs, Hardware Acceleration
- Performance Estimation
- Sensing and Motor Control

Interested to Develop Further

- Embedded/Safety critical
- Hardware Design
- Wired and wireless networking, Multiprotocol Communications
- Short Range Radars

ESA Generic Product Tree (3)

- 2 - Satellites & Probes
  - 2-F - On-board Data Management
    - 2-F-1.1 - On Board Data Management – BB
      - 2-F-1.1-e - General Purpose Programable Logic (PLD, FPGA)
  - 2-I - Payloads / Instruments
    - 2-I-1 - RF and microwave Instruments
      - 2-I-1-b - Imaging Radars
- 3 - Transportation & Re-entry Systems
  - 3-E - On Board Data Mangement
    - 3-E-1.1 - On Board Data Management - BB
      - 3-E-1.1-b - Programmable logics (FPGA, PLD)

ESA Technology Tree (3)

- 1 - On-board Data Subsystems
  - 1-A - Payload Data Processing
- 13 - Automation, Telepresence & Robotics
  - 13-A - Robotic Applications and Concepts
    - 13-A-I - Planetary Robotic Exploration
  - 13-C - Automation & Robotics Components and Technologies
    - 13-C-I - Perception for Robots

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Contact Us:

Ilias Alexopoulos, business@aizerocaliber.com

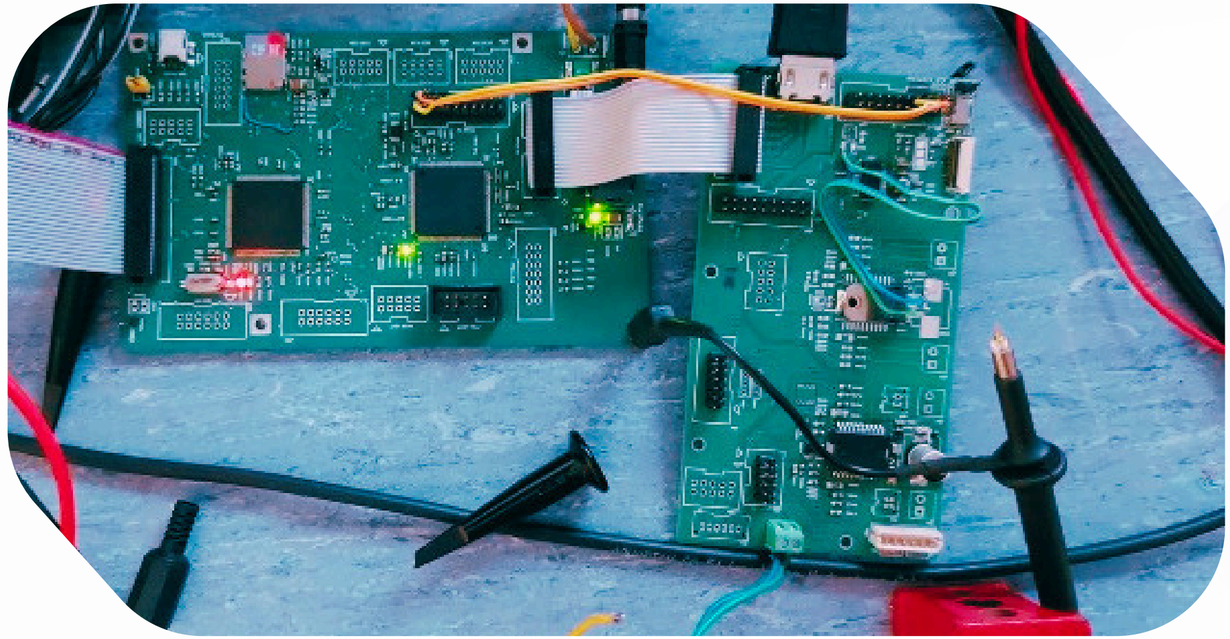
Company needs

Our Needs:

- Rover manufacturers, integrators or users
- Space Robotics Applications

We Can Offer:

- Embedded Design Hardware
- Embedded Firmware
- FPGA design



Thank You!