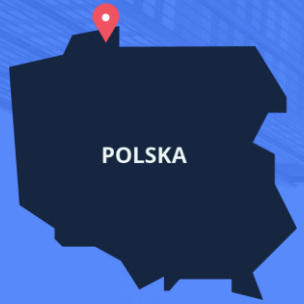
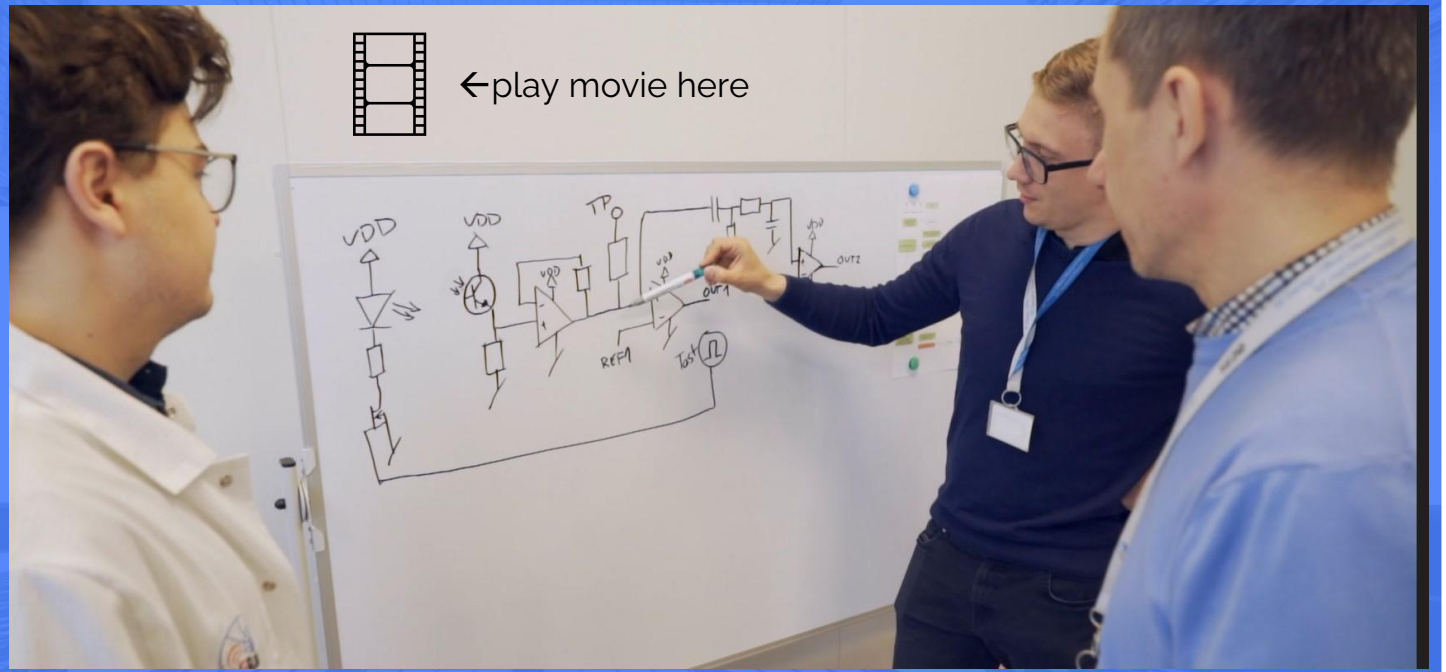
WIRAN SPACE AND DEFENCE PORTFOLIO

List of content (page no.)**:**

1.1 About us: video presentation (2 min)





Since 2002
design office with app. 28 engineers specialized in:
- hardware & firmware design & development,
- Radio Frequency / wireless communication technologies.

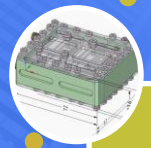
1.2 About us: areas of competences

own scope:
- R&DaaS,
- design and manufacturing of high reliability devices,
- RF / EMC testing and consultancy,
- clean room (ISO 7 class).

with subcontractors:
- PCB manufacturing,
- SMD assembly,
- precision mechanics.


Project definition


CAD simulations


Project

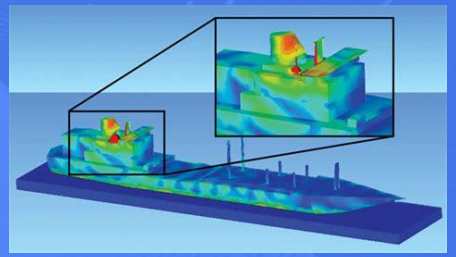

Prototype


EMC and functional tests

TD	ESA Technology Domain	WiRan
6	RF Payload and Systems	+++
7	Electromagnetic Technologies and Techniques	+++
17	Optoelectronics	+
21	Thermal	+
23	EEE Components and Quality	+++
24	Materials and Processes	+
25	Quality, dependability and Safety	+

1.3 About us: projects

WiRan - hardware design within:
- industrial projects,
- SPACE & DEFENCE (naval & land vehicles),
- various non standard R&DaaS.



SEZO - IoT telemetry solutions for:
- tracking, temperature and other physical parameters,
- infrastructure monitoring & security,
- air quality measurement.

2.1 Achievements: flight products

Space products
(Flight Radio Frequency Hardware):

TRL-9*

- X band antenna
- X-band diplexer (DXB)
- S band antenna
- S band diplexer
- S band splitter
- L band splitter

TRL-7*

- S band hybrid coupler
- X-band diplexer (DXA)
- X band splitter
- X band hybrid coupler
- L band hybrid coupler

- Multiple simulations of antenna placement on satellite structures

* status as of 2025-06

2.2 Achievements: non-flight products

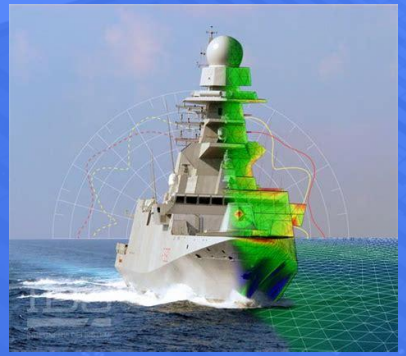
Other:

- RF SCOE (Radio Frequency Special Check-out Equipment)
- RF GSE (Ground Segment Equipment)
- Power supply units (PSU)
- Terrestrial sensor product range capable of exceeding bidirectional connectivity to space communication (LoRaWAN, LTE-M, NB-IoT)

3.1 Current and pending projects: cooperation with Polish Armaments Group

- PGZ Naval Shipyard
- Centrum Techniki Morskiej

Year long cooperation in scope of numerical analysis of antenna fields as well as well as the design and production of military systems.



Fot. https://ctm.gdynia.pl

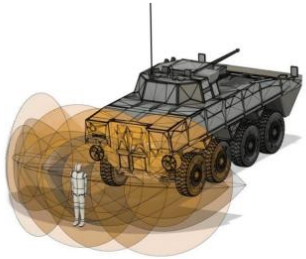
Fot. https://pgzsw.com.pl

3.2 Current and pending projects: cooperation with Rosomak S.A.

ROSOMAK S.A.
Siemianowice Śląskie

SEZA

MILITARY SOLUTIONS



Reversing sensor for KTO Rosomak
ultrasonic + radar sensors

FEATURES

> small dimensions allowing for mounting in various places on the vehicle;
> devices compliant with military EMC, mechanical & environmental standards

Parameter	Value
Detection zones & distances	- caution zone (300 cm - 180 cm) - danger zone (180 cm - 100 cm) - collision risk zone (100 cm - 0 cm)
Signal types	Visual (with varying colors) & acoustic (toggle on/off, modulated)
Minimal obstacle size	Ø75 mm pole
Operational temperature range	-30 °C ÷ +60 °C
Power	18 – 36V DC, max 1A

3.3 Completed projects and current activities in the space sector

NCBiR project:

- RAISING THE TECHNOLOGICAL READINESS OF PRODUCTS/COMPONENTS OF WIRAN S AND X BAND COMMUNICATION SYSTEMS TO THE TRL9 LEVEL
- budget 4676kPLN, realization 2020-2023

ESA projects:

- Ku and Ka-BAND FILTERS FOR TRANSMIT AND RECEIVE ACTIVE ANTENNAS" – ARTES, budget 550kEUR, realization 2022-2025
- COMPACT S-BAND DIPLEXER FOR SMALL SATELLITES TTC APPLICATIONS (ARTES AT 5E.023), budget 500kEUR, realization 2023-2025
- RF INTERFERENCE MONITORING FOR SPACE MISSIONS, budget 2549kEUR, realization 2025-2027

https://esastar-publication-ext.sso.esa.int/ESATenderActions/details/91417

4 Development road map: space components

1. Low gain L band antenna (GNSS all-bands antenna)
2. Medium gain L band antenna (GNSS all-bands antenna)
3. High gain S band antenna
4. Low gain X band antenna
5. High gain X band antenna
6. L / S / X band splitters
7. L / S / X band couplers
8. RF cables for space application
9. Ku & Ka band filters
10. Active antennas, phased arrays
11. Reaching TRL 9 for the above components

5 Further capabilities: (beyond space components road map)

1. **Radio paths from HF to Ka bands**
   a. Amplifiers - LNA, VGA, PA
   b. Generators
   c. Passive and active antennas, fixed and steerable
   d. Filters
   e. Frequency converters
2. **Radio stations**
3. **Power supplies/power systems**
4. **Measurement systems, including wireless ones**
   a. SCOE (Special Checkout Equipment)
   b. EGSE
   c. RF SCOE
   d. Communication systems, including optical systems for special applications
   e. Monitoring of almost any physical quantity
5. **Electromagnetic and compatibility analyses:**
   a. (electrically large objects, crosstalk on satellites, analyzes of radiation characteristics on satellites, etc.)
   b. EMC research and troubleshooting
6. **Designs and Mechanical Analysis**
   a. Mechanical test resistance simulations
   b. Hi-rel mechanics designs
7. **Qualification and support of this process**
   a. Documentation
   b. Analyzes
   c. Appropriate research
8. **Hi-rel electronics production**
   a. Clean room
   b. Climatic tests

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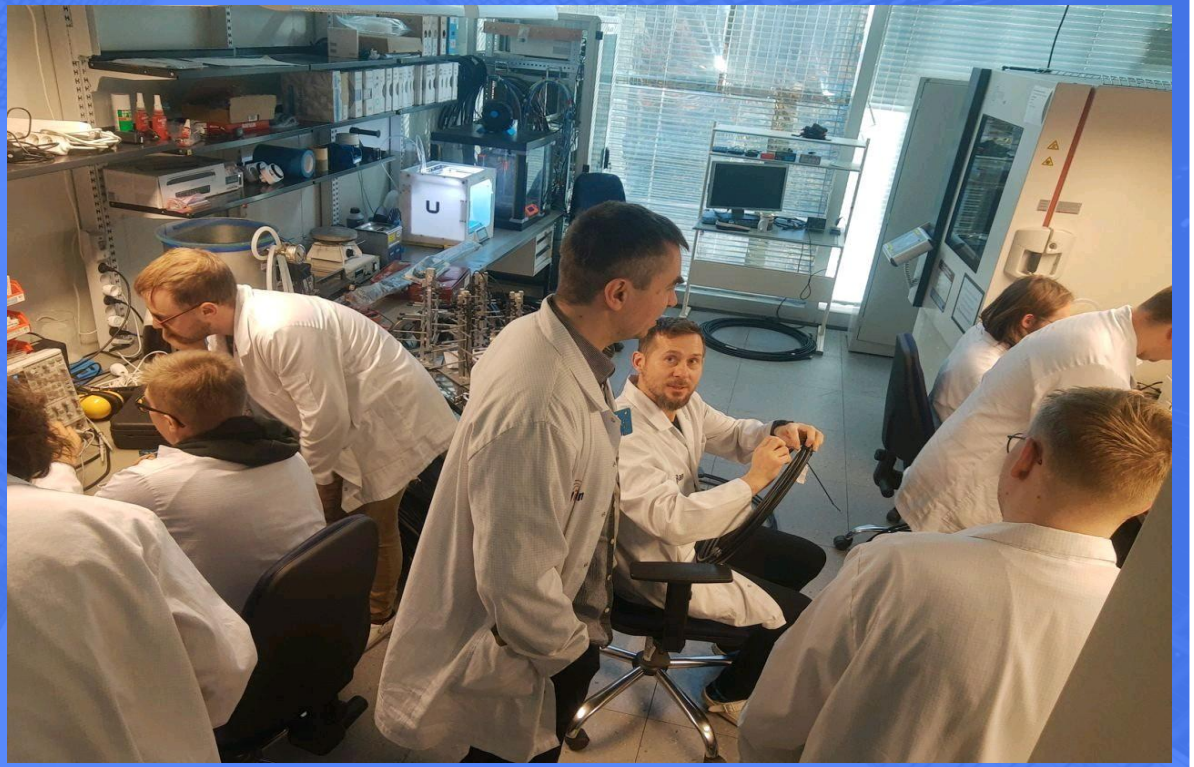

info@wiran.pl