OVERVIEW

US-Spain Industry Day

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DAS Photonics: Who we are

Founded in 2005 as a technology start-up company with venture capital funds (independent company).

DAS develops innovative products based on its proprietary photonic technology for high performance sectors such as Defence, Avionics and Space.

RF Photonics (DAS´core technology): technology aimed at transmitting, generating and processing RF/MW/Electronic signals with capabilities that overcome RF limits especially in ultra wide band applications.

Basic Functionalities: RF over Fiber-optic transmission (remoting sensors/antennas)

Advanced functionalities: frequency-independent RF delays, freq. converters, sampling, ...

- Instantaneous Bandwidth
- SWaP
- EMI Free
- Cost Effective
- Distance
- Maintenance
- Upgrades
DAS Photonics Facilities

- Design and manufacture of photonic components (CMOS). 500 sqm clean-room
- Design and manufacture of products with photonic / RF / electronics
- Laboratories of System Integration
- T&M Labs
- 60+ employees including Scientists, Product development engineers and technologist, business development

QUALITY ASSURANCE

- Certifications: ISO-9001, AQAP2110 *(NATO Secret)* & AS-9100
- Space certified processes (ESA): ECSS-Q-ST-70-08, ECSS-Q-ST-70-38 and ECSS-Q-ST-70-28
- QA in design according with ECSS *(European Cooperation for Space Standardization)*
Market differentiator: Photonics-based capabilities

**Beyond RF limits**

**Electronic Warfare**: Electronic Measures-ELINT, COMINT
Electronic Attack/ Protection-ECM POD
Photonomically-steerable Broadband SAR

**Radar Support Equipments**: Multi-Radar calibration

**MILSATCOM technology**: Photonic payloads
What are our capabilities?

DAS Photonics is an equipment/system supplier of Defence & Aerospace primes (platform integrators). Customized new developments of innovative solutions employing advanced RF photonics technologies are also provided upon request.

Photonic integrated Circuits

Modules & boards

Platform equipments/systems

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DAS Capability Overview

Active Optical Connectors and digital fiber-optic links

Microwave Fiber-optic links

Rugged Digital Fiber-optic links

Sub-systems using Optical Delay Lines

Variable Delay - VMR 8 bit
- Programmable delays
- Delay range between 80 ps and 20.42 ps (up to 8 bits resolution)
- LAN Ethernet / RS-232

Fix delay up to 40 GHz
- Compact module: True delay for RF signals up to 40 GHz
- RS delay: nominal 48.8 ps, selection by design
- Ingress protection IP66, minimum interface

RADAR test/calibration/training, VMR 8 bit, 20 GHz & 40 GHz
- Configurable equipment with fixed/variable delay modules
- Configurable frequency range
- RADAR calibrations, operator training

R & D
- Research activities in true-time delay applications
- Fiber optics & integrated photonics

Equipment Instruments

EW/ELINT/RW Receivers

Radar/EW Simulator/Calibration/Training

Ultra-high performance Millimeter-wave Reference Signal Generator and Distribution systems (Radiotelescope ALMA)

Research
Nano-BQ sensing

Research Silicon photonics Micro-gyros

Expertise in photonics modules for Space: GEO ALPHASAT & LEO PROBA-V HISPASAT 1F, AMAZONAS 5

Commercial-in-Confidence

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Main USP differentiators: Photonics-based ESM/ELINT system

Photonics technology **improves features of classical RF front-ends** as follows:

- **Frequency resolution and sensibility comparable to super-heterodyne** technology.
- **Instantaneous wide bandwidth** analysis with high sensibility in threat detection **in the whole spectrum range** (40 GHz instantaneous bandwidth)
- **Extends the input bandwidth of an electrical ADC maintaining the dynamic range**, which enable the **direct digitalization of RF signals without frequency conversion stages**

**Instantaneous bandwidth (DC to 40GHz)**

- **Antenna Set** (multi-sectorial or spinning)
- **Photonic Digital Receiver**
- **ELINT Console** (signal intelligence analysis)
Main USP differentiator: Wideband ECM for Radar Deception

Substitutes traditional **Digital RF memories (DRFM)**

- Effective Implementation of RF radar deception techniques such as RGPO, VGPO, Cross-eye.
- Variable RCS generation (active and complex)
- **Reduction of SWaP (most suitable for UAV SP-PODs)**
- Frequencies up to 40 GHz in a single module.
- Very low (sub ns) lattencies
- Very robust against ECCM techniques (freq hopping, varying PRF,...)

**Ultra-Wideband Radar Deception**