DAS Photonics

OVERVIEW

US-Spain Industry Day

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www.dasphotonics.com

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 **D**efence, **A**vionics and **S**pace.

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

***MILSATCOM** technology:*
Photonic payloads

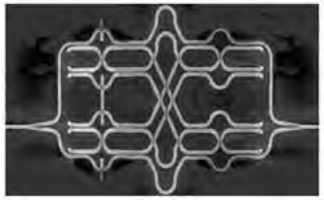
***Electronic Warfare** : Electronic Measures-ELINT, COMINT*
Electronic Attack/ Protection-ECM POD
Photonically-steerable Broadband SAR

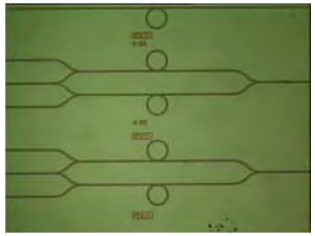
***Radar Support Equipments**: Multi-Radar calibration*

What are our capabilities?

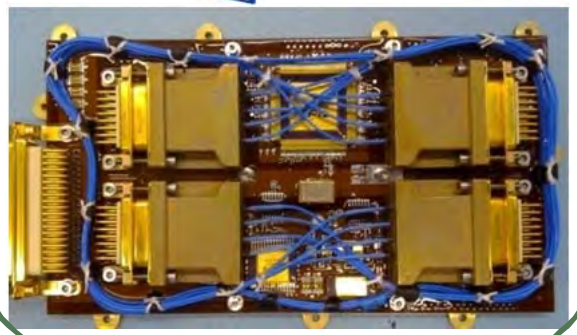
DAS Photonics is an equipment/system supplier of Defence & Aerospace primes (platform integrators). Customized new developments of innovative solutions employing advanced RF photonics technologies are also provided upon request.

Photonic integrated Circuits

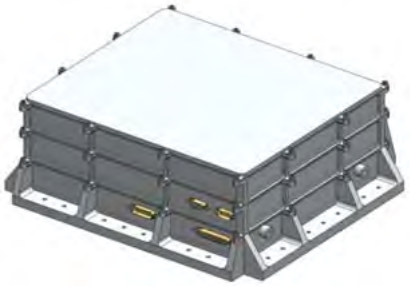




Modules & boards



Platform equipments/systems



DAS Capability Overview

Active Optical Connectors and digital fiber-optic links

Rugged Digital Fiber-optic links

Sub-systems using Optical Delay Lines

Variable Delay - VME 8 bit	Fix delay up to 40 GHz	RADAR test/calibration/training. VME 6U 6, 10, 18 & 40 GHz	R & D
• Programmable delay. • Delay range between 80 ns and 20,42 µs (up to 8 bits resolution) • LAN Ethernet / RS-232	• Compact module. True delay for RF signals up to 40 GHz. • Fix delay: nominal 48,8 µs, selection by design • Ingress protection IP54 minimum (external use)	• Configurable equipment with fix/variable delay modules • Configurable frequency range. • RADAR calibration, operators training.	• Research activities in true-time delay applications • Fiber-optics & integrated photoncis.

Microwave Fiber-optic links

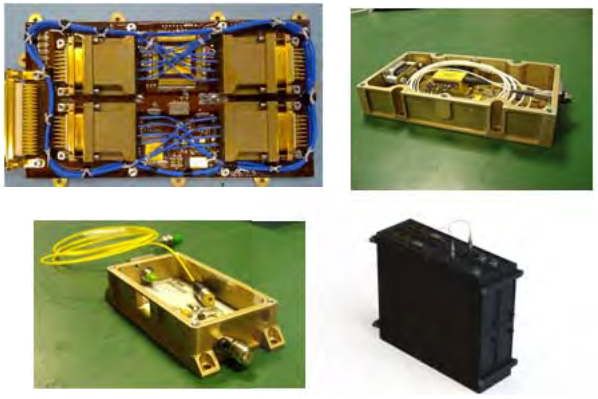
Basic Tx/Rx 3.5GHz	Variable gain Tx/Rx	Basic Tx/Rx 6GHz	VME 6U family
• 0.01 to 3.5 GHz • Fixed 0dB gain • Integration within equipment	• 0.01 to 3.5 GHz • Variable 0dB gain • Status monitoring	• 0.01 to 6 GHz • Fixed 0dB gain • Integration within equipment	• 3.5, 6, 10, 20 & 40 GHz • Integrable with digital links • VME compatible • Fixed or variable gain

Equipment Instruments

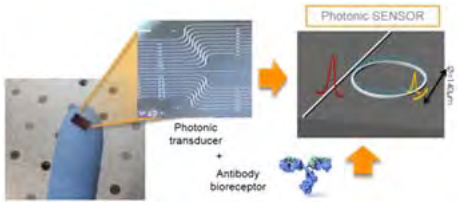
EW/ELINT/RW Receivers

Radar/EW Simulator/Calibration/Training

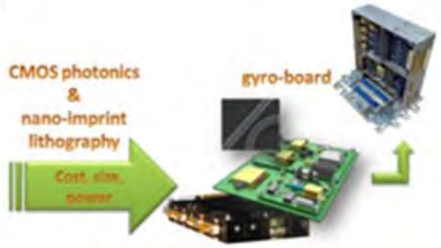
Ultra-high performance Millimeter-wave Reference Signal Generator and Distribution systems (Radiotelescope ALMA)



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



Research Nano-BQ sensing



Research Silicon photonicsMicro-gyros

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)

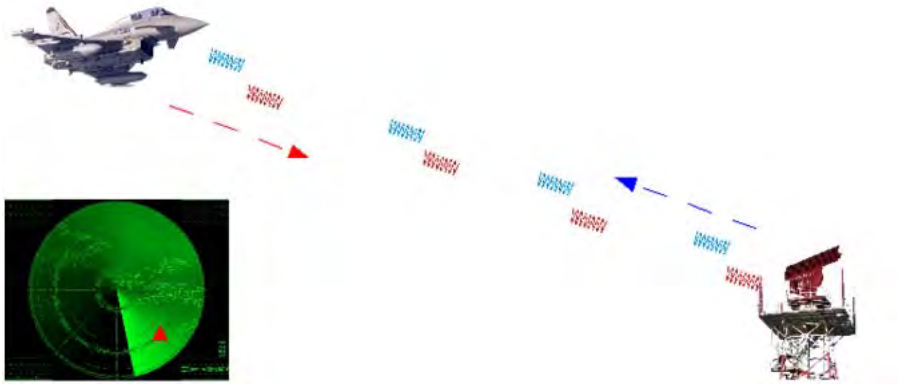
Photonic Digital Receiver
The core of the system

ELINT Console
(signal intelligence analysis)

Main USP differentiatiator: 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