



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 **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, ...**



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

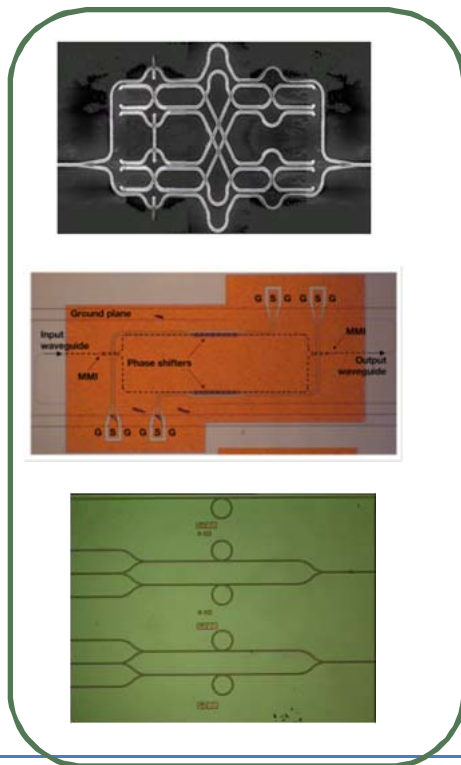
Electronic Warfare : *Electronic Measures-ELINT, COMINT
Electronic Attack/ Protection-ECM POD
Photonically-steerable Broadband SAR*

Radar Support Equipments: *Multi-Radar calibration*

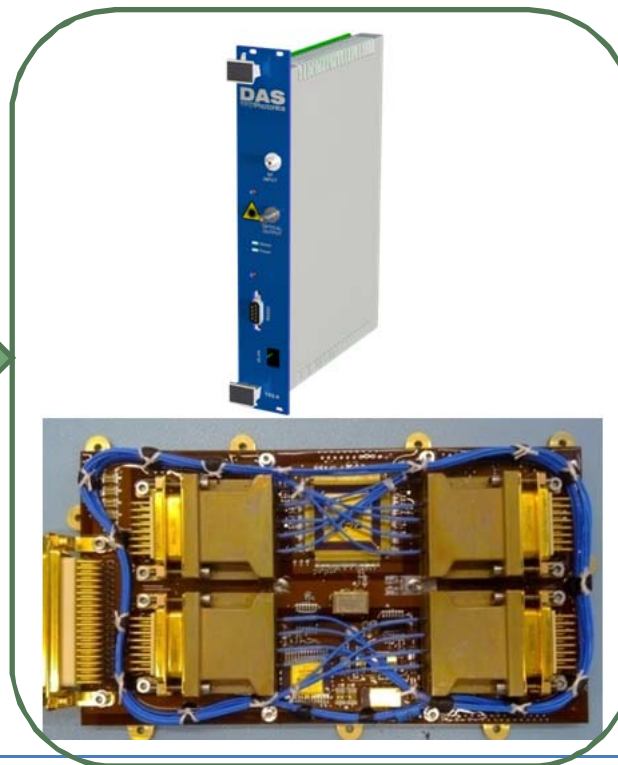
What are our capabilities?

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



Commercial-in-Confidence

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DAS Capability Overview

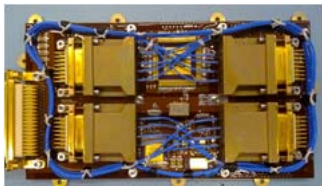


Active Optical Connectors and digital fiber-optic links

Microwave Fiber-optic links



Basic Tx/Rx 3.5GHz	Variable gain Tx/Rx	Basic Tx/Rx 6GHz	VME 6U family
<ul style="list-style-type: none"> 0.01 to 3.5 GHz Fixed 0dB gain Integration within equipment 	<ul style="list-style-type: none"> 0.01 to 3.5 GHz Variable 0dB gain Status monitoring 	<ul style="list-style-type: none"> 0.01 to 6 GHz Fixed 0dB gain Integration within equipment 	<ul style="list-style-type: none"> 3.5, 6, 10, 20 & 40 GHz Integrable with digital links VME compatible Fixed or variable gain



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

Rugged Digital Fiber-optic links

Sub-systems using Optical Delay Lines

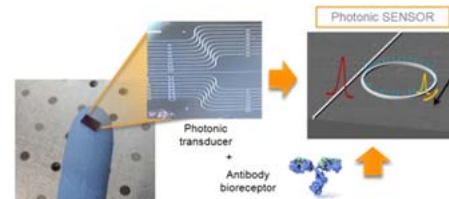
Variable Delay - VME 8 bit	Fix delay up to 40 GHz	RADAR test/calibration/training. VME 6U, 10, 18 & 40 GHz	R & D
<ul style="list-style-type: none"> Programmable delay. Delay range between 80 ns and 20.42 μs (up to 8 bits resolution) LAN Ethernet / RS-232 	<ul style="list-style-type: none"> Compact module. True delay for RF signals up to 40 GHz. Fix delay: nominal 48,8 μs, selection by design Ingress protection IP54 minimum (external use) 	<ul style="list-style-type: none"> Configurable equipment with fix/variable delay modules Configurable frequency range. RADAR calibration, operators training. 	<ul style="list-style-type: none"> Research activities in true-time delay applications Fiber-optics & integrated photonics.

Equipment Instruments

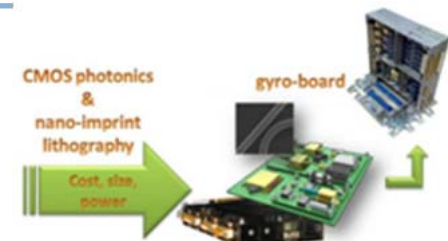
EW/ELINT/RW Receivers

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

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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
The core of the system

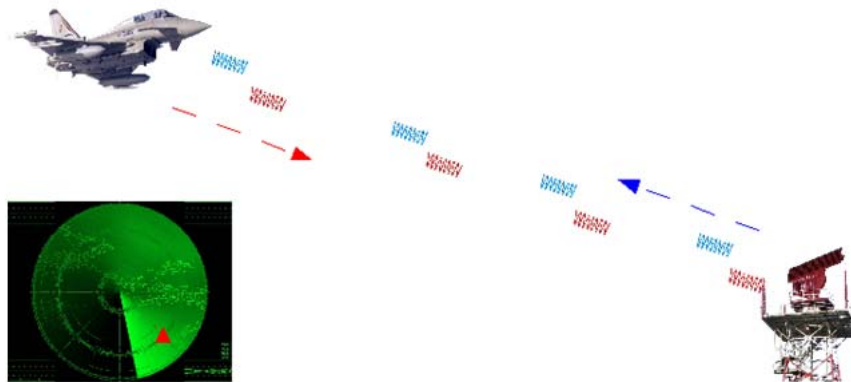
ELINT Console
(signal intelligence analysis)



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) lattendencies
- Very robust against ECCM techniques (freq hopping, varying PRF,...)



Ultra-Wideband Radar Deception

