smartcom.bg

SMARTCOM OVERVIEW



SMARTCOM BUSINESS PROFILE

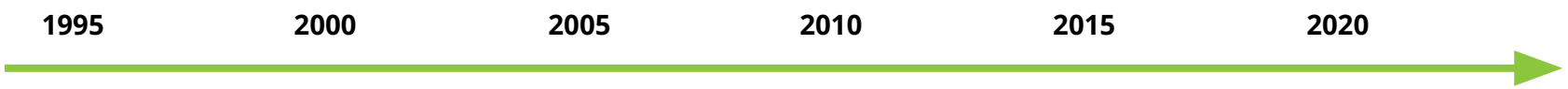
START	In 1990 a team of industrial engineers set out to commercialize research in telecommunication technologies
VALUES	Freedom. Team of individuals. Integrity. Customer focus.
CUSTOMERS	Communication service providers (CSPs), large enterprises
TECH DOMAINS	Telecommunications, electronics
PORTFOLIO	Own Products, Integration solutions, Professional services
OFFICES	Bulgaria, Turkey and UK (legal entity)
PATENTS	Signal filtering, Passive opto-mechanical sensor
CERTIFICATION	ISO 9001, ISO 14001, OHSAS 18001, ISO/IEC 27001

WHO IS SMARTCOM

We deliver SUSTAINED business value through smart and tailored APPLICATION of world-class technology in TELECOMMUNICATIONS and ELECTRONICS

ICT Integration		Own Products
Professional services	**Solutions**	
Deployment of transmission networks	Transmission networks	Smartcom xCPE
Network integration	IP networks	Smartcom FiberEye
Outsourced support	Provider service core	Smartcom Synapse
Turnkey telecom facilities		Converged telecom apps

PRODUCT AND SERVICES EXPERTISE GROWS OVER TIME



PRODUCTS / SUPPORT

Outsourced development
Quintexcom - ISDN: 1994 - 2000
Pairgain / ADC - 1999 - 2002
IBM - 2002 - 2008
etc.

The Bonds 2007 - 2015
Access suite (based on active ethernet): (1) aggregation switch, (2) access switch, (3) CPE and (4) management software

xCPE 2010 - now
Customizable CPE with Quality of Experience monitoring.
Manageable via TR-069.

INTEGRATION / SERVICES

Access & IP network integration
Pairgain / ADC - xDSL, xDOCSIS: 1994 - 2009
Juniper Networks 2001 - now
Ascend Communications (Lucent /Alcatel/Nokia) - access, dial-up, xDSL: 1997 - 2006
Various xPON projects 2008 - 2012
Smartcom Products - 2007 - current
etc.

Transmission networks
2009 - now
Deployment of subsea and terrestrial DWDM equipment for META and various Infinera customers: EU, Middle East, Africa, Asia.

Mobile and Converged networks core
2010 - now
Converged telecom applications, signaling and policy, network and border session control, unified communications.

SPINOFFS

Haemimont
1994 - 2002
Software development.

IBM / GLOBALFOUNDRIES 2002 - 2019
Grew contracting team from 0 to 120.
Process Design Kits which are used in Electronic Design Automation.
Acquired by GF in 2019.

Barin Sports
2015 - now
Sports science company with athlete tracker, data analytics and recommendations engine.

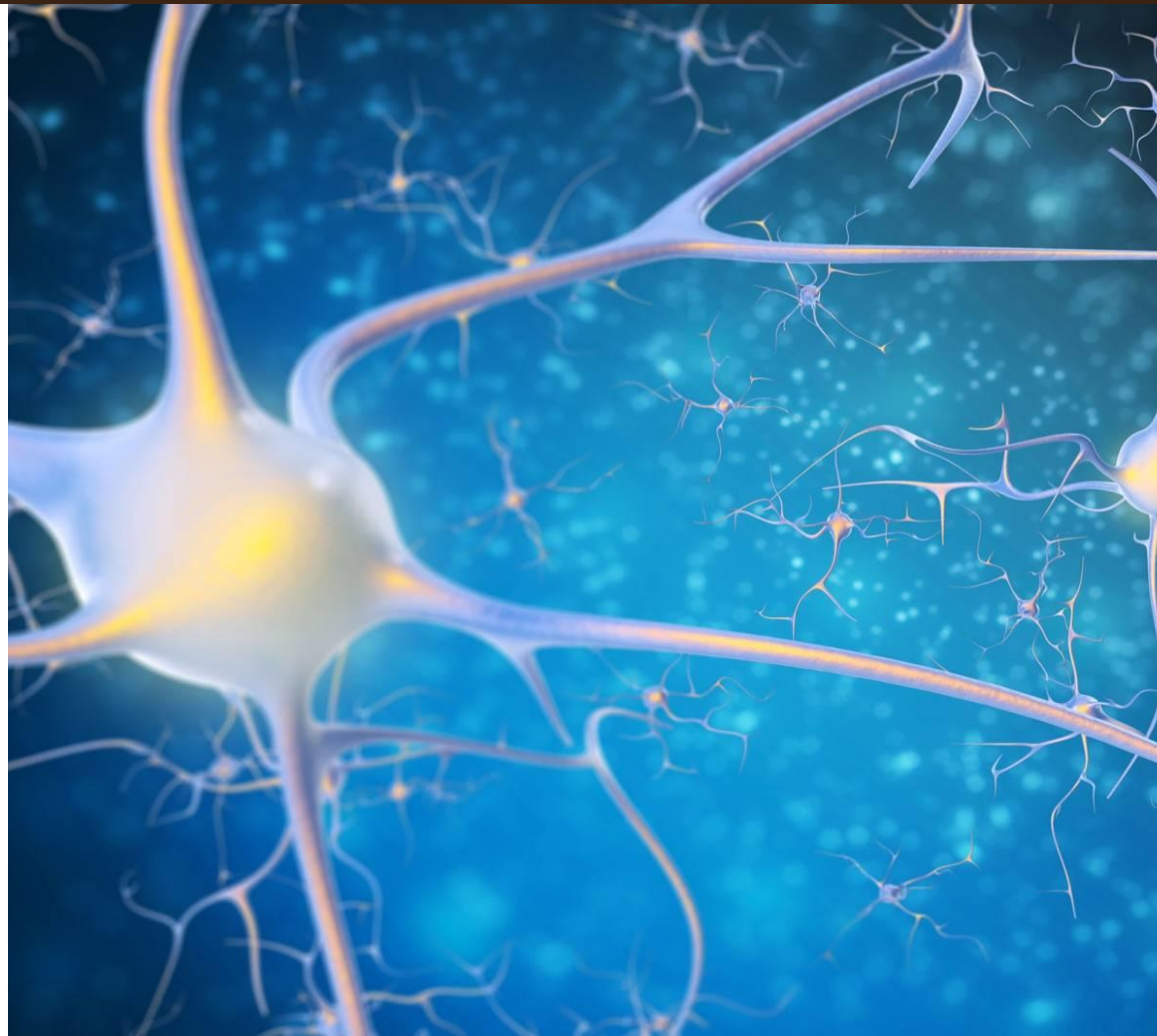
SMARTCOM

SYNAPSE

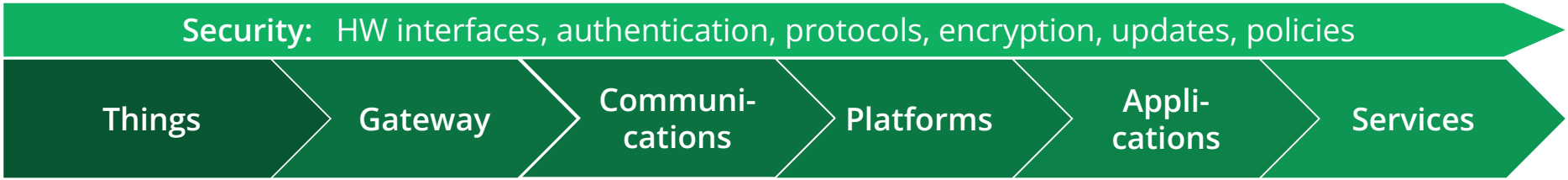
Solve for Edge

Connect **any sensor** in the field (temperature, vibration, water meter, etc.) to **any** Internet of Things **platform** via 3G/4G, NB-IoT, LoRa. Solve the **integration problem** at the edge of IoT projects. **Customizable** to fit the precise project requirements.

smartcom.bg/products/synapse



VENDORS ARE FOCUSED ON PLATFORMS AND APPLICATIONS AND IGNORE THE COMPLEXITY AT THE EDGE OF IoT PROJECTS



These technologies are **IGNORED** by IoT vendors

These technologies are the **MAIN FOCUS** for IoT vendors

Focus of Smartcom

Smartcom developed Synapse to **CONNECT THE EDGE** of IoT projects

A MODULAR DESIGN ENABLES ANY CONNECTIVITY OF ANY SENSOR FOR EASY PROJECT INTEGRATION AND OPTIMAL COST

Sensors: per project need

- utility meter
- moisture
- sound
- vibration
- temperature
- ...any sensor

Smartcom Synapse device

- Radio module(s)
- Battery with intelligent power management
- CPU
- Customizable firmware
- Data storage
- Sound feedback
- Centralized management and updates
- IP 68





Different enclosures are available

Connectivity: per project need

- NB-IoT
- LTE-M
- 2G, 3G, LTE
- wi-fi
- LoRa
- wired

Standards-based integration

RESTful API

MQTT

CoAP

Back- and front-end: per project need

Database backend

Dashboarding tools

TWO CURRENT **USE CASES** IN OPERATION

PERIMETER SECURITY	SMART METERING FOR UTILITIES
■ Protect remote assets via any radio: 2/3/4G, LoRa, NB-IoT, etc. ■ Intelligent power management with 5 yrs battery life (based on normal usage) ■ Ability to attach intrusion, temperature, humidity and other sensors ■ Immediate alerts and mapping of security events ■ IP65 environmental protection	■ Avoid investment in expensive smart meters ■ Improve billing accuracy ■ Decrease technical losses ■ Localize abnormal usage ■ Better network planning
1000 DEVICES installed by a Tier 1 telecom to protect remote manholes and cabinets.	**3000 DEVICES** installed by Veolia in Bulgaria's capital to monitor its internal water network.

SYNAPSE OFFERS SIGNIFICANT ADVANTAGES VS STANDARD OFF-THE-SHELF GATEWAY DEVICES

	SMARTCOM SYNAPSE	OFF-THE SHELF GATEWAY / LOGGER
CONNECT ANY SENSOR / THING	yes	sometimes
HARDWARE FIT TO IoT PROJECT	yes	sometimes
SOFTWARE FIT TO IoT PROJECT	yes	sometimes
EASY INTEGRATION INTO THE WHOLE IoT PROJECT	yes	sometimes
VENDOR LOCK-IN	no	often
MANUFACTURABLE AT SCALE	yes	yes
COST EFFECTIVE	yes	Depends on the brand

SMARTCOM

FIBEREYE

smart and preventive
infrastructure monitoring

Permanent, automated monitoring of remote **critical civil infrastructure** via passive **optical sensors** and of telecom fiber/copper cables via TDR

smartcom.bg/products/fibereye



ENABLE SMART AND RESILIENT CIVIL INFRASTRUCTURE THROUGH **PERMANENT** MONITORING



optical technology



INNOVATIVE **OPTICAL** SENSOR TECHNOLOGIES

- **Fiber Bragg Grating (FBG)** is best for spot monitoring - the sensors are placed at precise locations.
- With **Raman** and **Brillouin** scattering, the optical cable is the sensor - detect temperature and strain.



strain | inclinometer | accelerometer | moisture | temperature | other sensors are available

THE ADVANTAGES OF OPTICAL SENSORS LEAD TO HIGHER RELIABILITY AND EASIER MAINTENANCE



Passive



No electromagnetic interference



No bad weather interference



Long usable life



Large measuring distance



Multiple consecutively connected sensors

PILOT PROJECT IN COOPERATION WITH THE MAIN BULGARIAN ARCHITECTURAL UNIVERSITY FOR BRIDGE STRUCTURAL HEALTH

WORK

A key **road bridge** in Sofia was selected.

The sensor network will consist of traditional and **optical** sensors situated on critical spots.

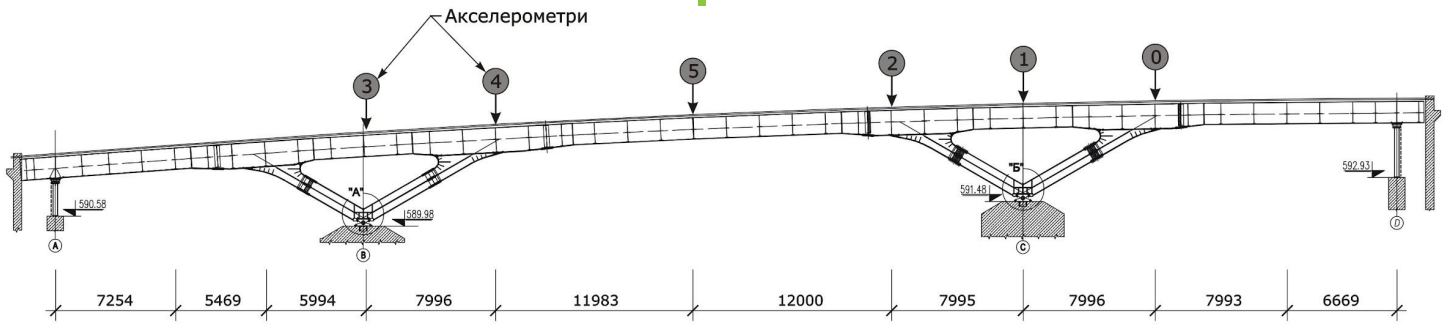
Permanent monitoring of **strain, acceleration and relative displacement**.

RESULTS

Fiber Bragg was chosen due to its effectiveness and maturity.

Permanent data gathering to accumulate data for analysis with AI tools.

Daily feedback on **road usage**. Alert notification when **critical values** are achieved.

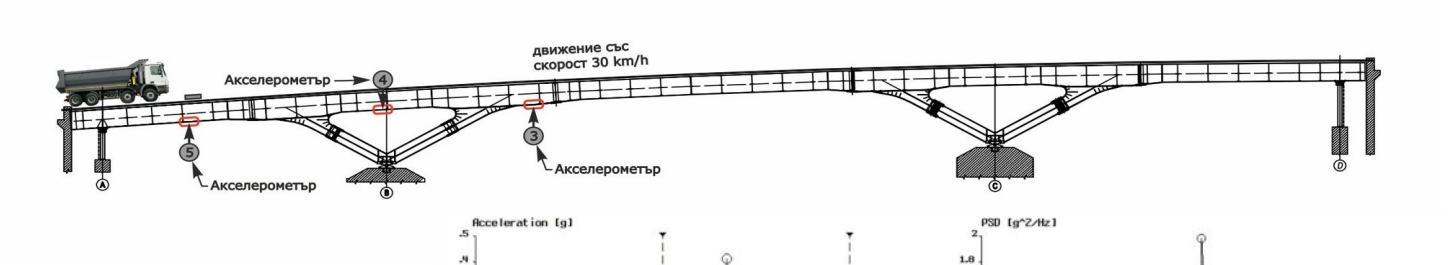


PROTOTYPE SITE - TESTING WITH HEAVY TRUCKS

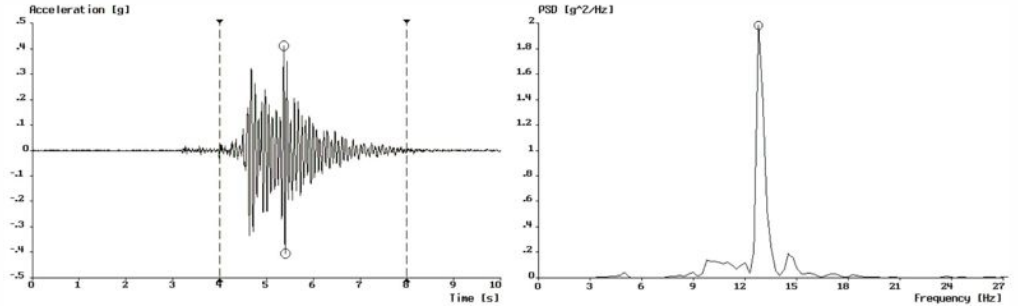
- Static load test of the structure



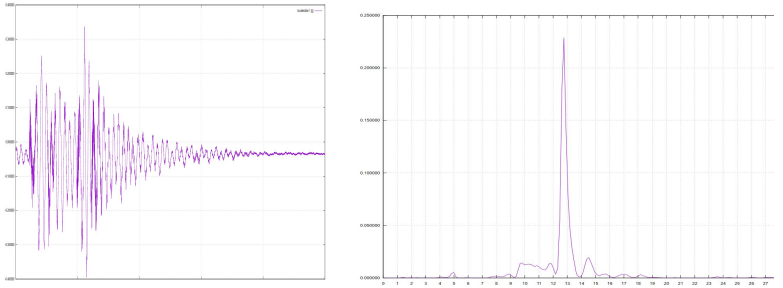
OPTICAL SENSORS OUTPUT THE SAME RESULT AS TRADITIONAL SENSORS



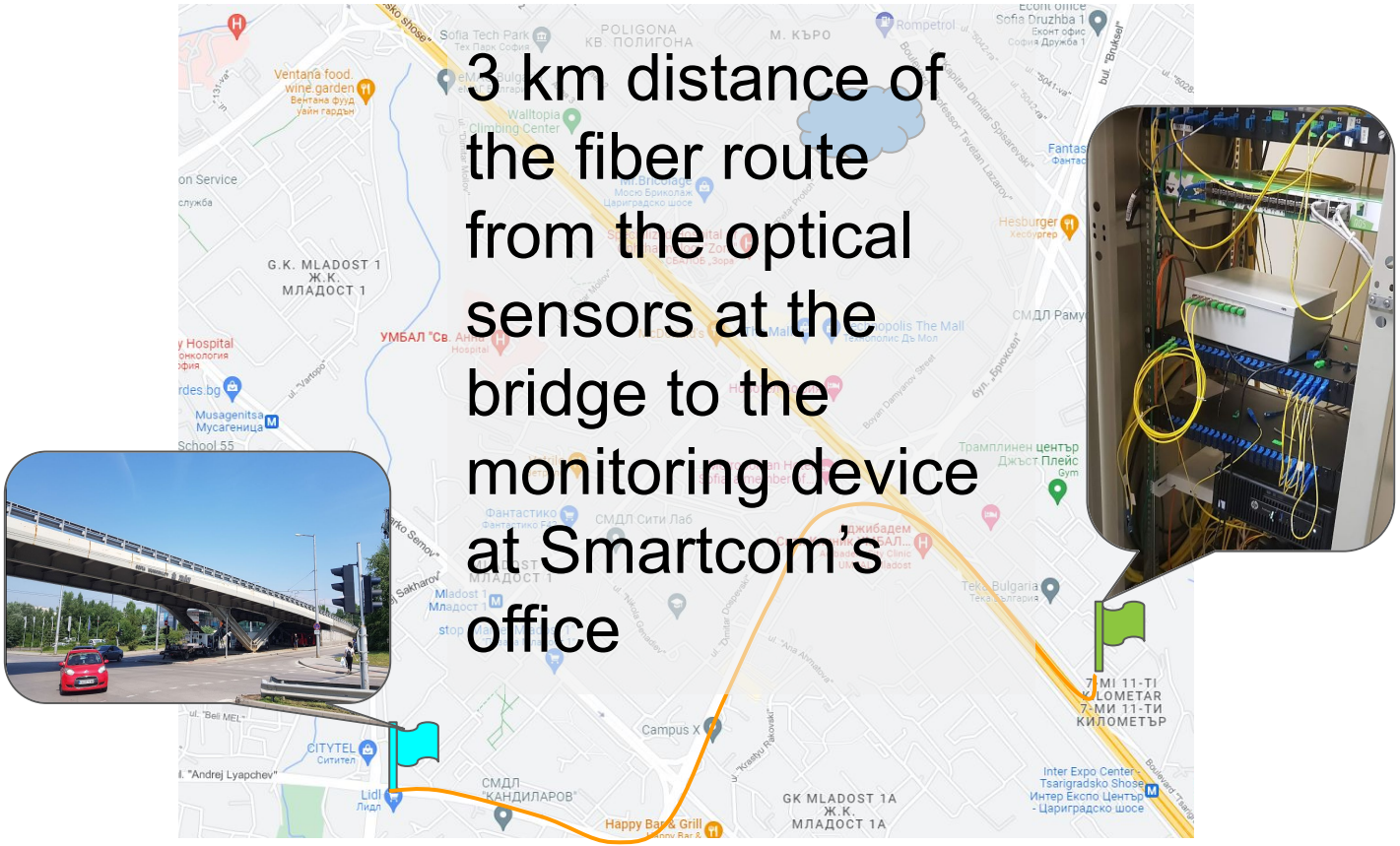
Traditional electro-mechanical sensors



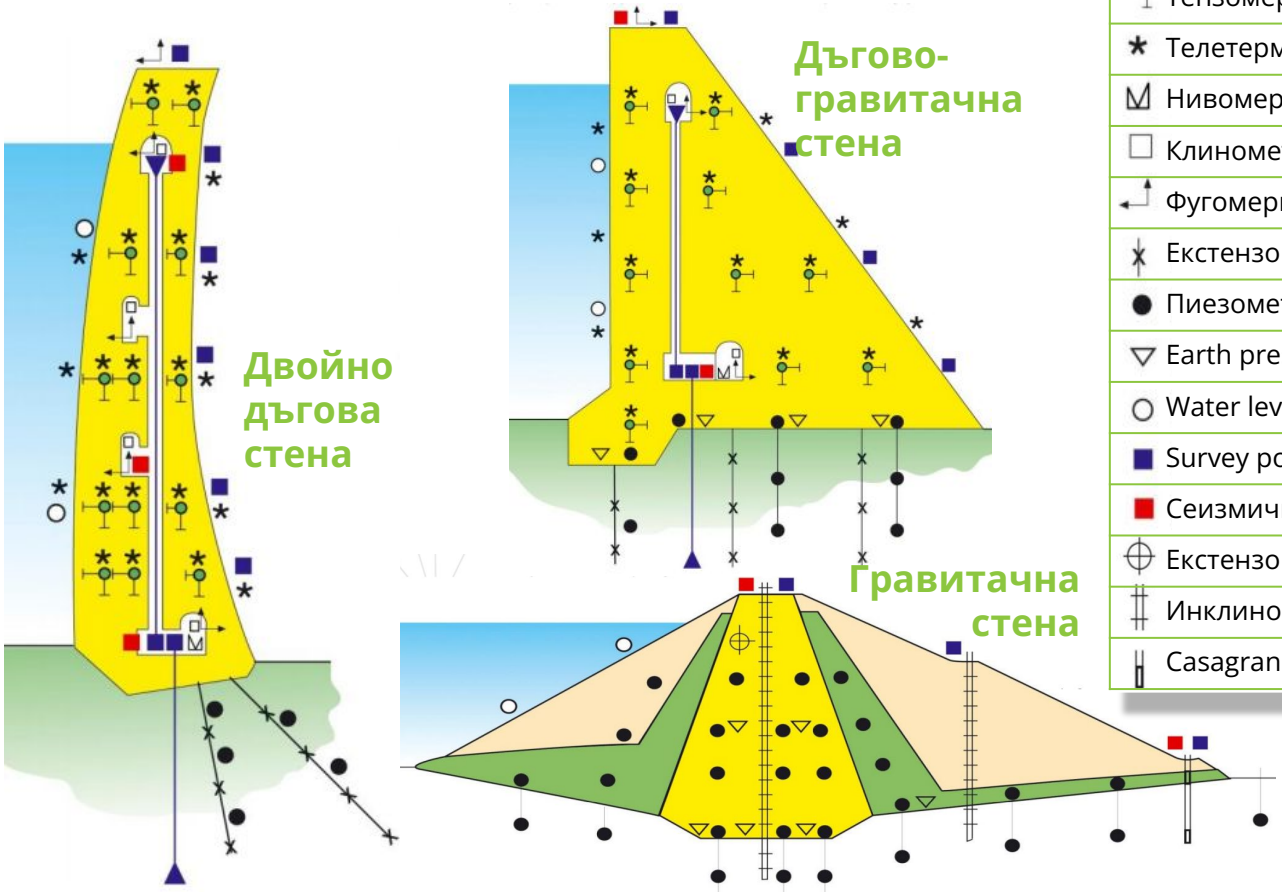
Optical sensors



PILOT INSTALLATION WORK OVER A LONG DISTANCE AND ON A FIBER CABLE ROUTE PROCURED FROM SEVERAL PROVIDERS



DAM MONITORING



Сензори	Стени Дъг.	Дъг.-Грав.	Грав.
Отвеси: прави и обратни	✔	✔	
Тензомери и телепресметри	✔	✔	
Телетермометри	✔	✔	
Нивомерни преливници	✔	✔	✔
Клинометри	✔	✔	
Фугомери (дилатометри)	✔	✔	
Екстензометри	✔	✔	
Пиезометри	✔	✔	✔
Earth pressure cell		✔	✔
Water level meter	✔	✔	✔
Survey point	✔	✔	✔
Сеизмична система	✔	✔	✔
Екстензометри			✔
Инклинометрични колони			✔
Casagrande piezometer			✔

SALE OF NANOELECTRONICS UNIT TO GLOBALFOUNDRIES

The relationship started with **IBM**'s chip-making business which was later acquired by **GLOBALFOUNDRIES**

Smartcom created to a team to make Process Design Kits (**PDKs**) which are plugged into various Electronic Design Automation (**EDA**) tools such as Cadence, Synopsis, etc.

120 engineers and physicists create and test tools to make it easier for chip designers to use various GF manufacturing technologies such as **22FDX**

GLOBALFOUNDRIES acquired this team in **October 2019** and set up its own development center in Bulgaria

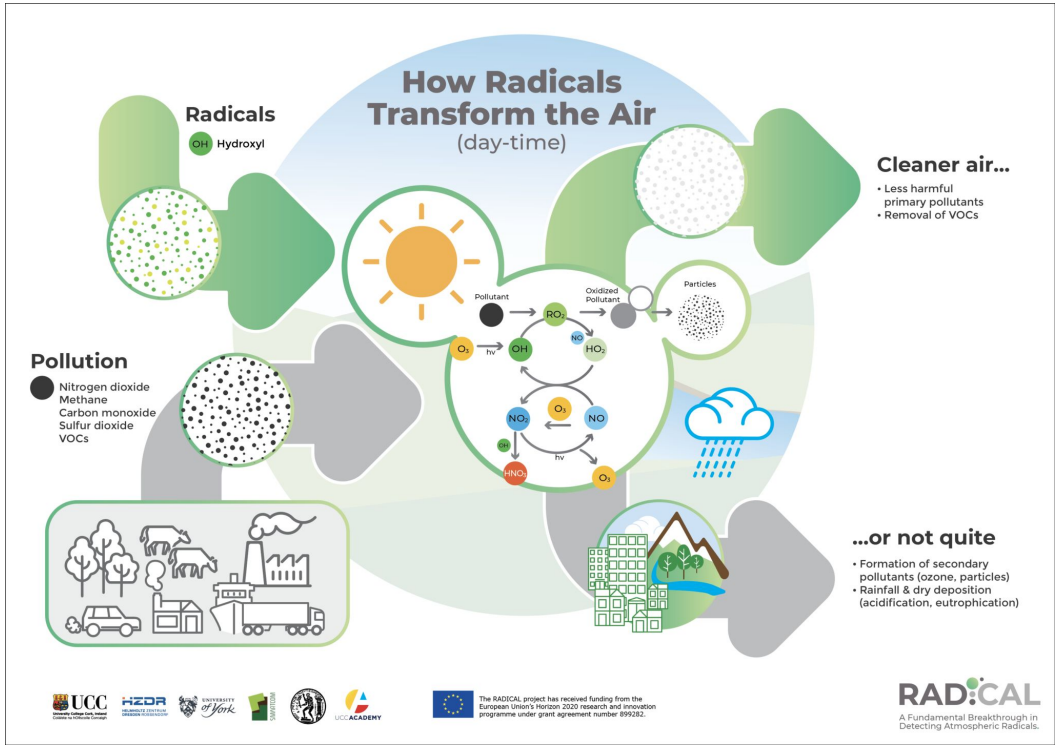
Reference:
https://www.globalfoundries.com/news-events/press-releases/globalfoundries-acquires-smartcoms-pdk-engineering-team-expand-worldwide

PROJECT RADICAL

radical-air.eu

Goal

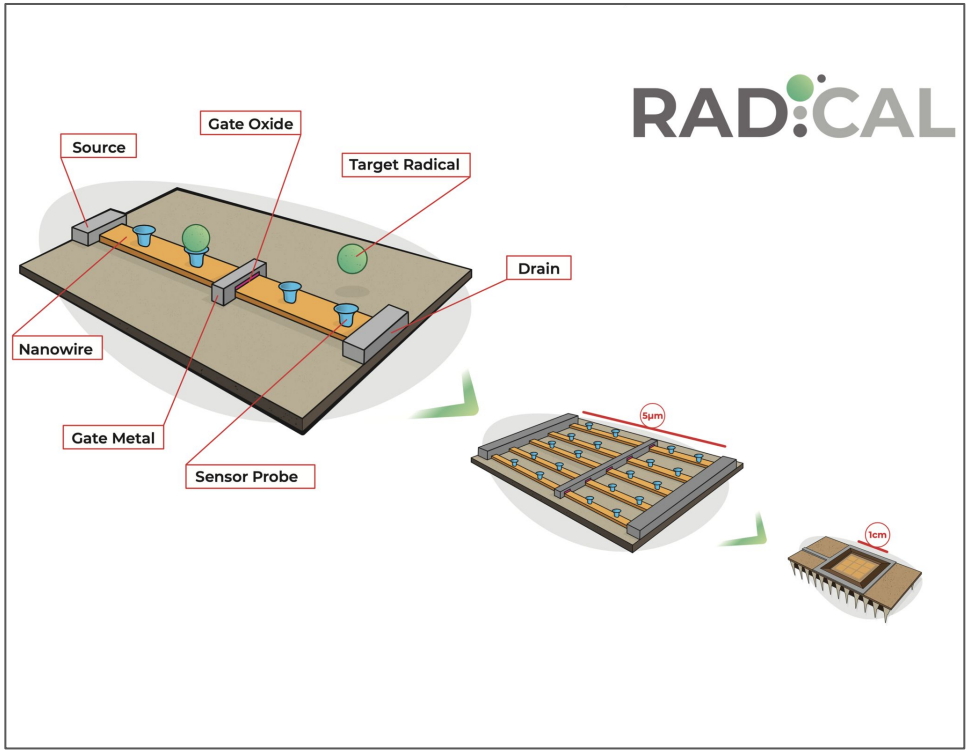
Achieve a fundamental breakthrough in detecting **atmospheric radicals** by developing a **low-cost sensor** to electrically detect these short-lived particles for the first time



The RADICAL project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 899282 .

PROJECT RADICAL

radical-air.eu



Smartcom's role

Design the sensor's integrated circuit in collaboration with a **team** of:

- Materials scientists
- Atmospheric chemists
- Physicists

from: University College Cork, Helmholtz-Zentrum Dresden-Rossendorf, University of York, UCC Academy

SMARTCOM PRODUCT DEVELOPMENT AND PROTOTYPING CAPABILITIES

- Project assessment by experienced pre-sales engineers
- Solution architecture design
- Microelectronics design
- Embedded software
- Outsourced manufacturing
- Scalable backends: cloud or on premises
- API design and integration into installed enterprise systems such as billing, CRM, ERP
- Graphical front ends: user rights hierarchies, GIS integration, dashboards for data analysis and visualization
- Experience in partnering with telecoms and other system integrators

SMARTCOM'S APPROACH

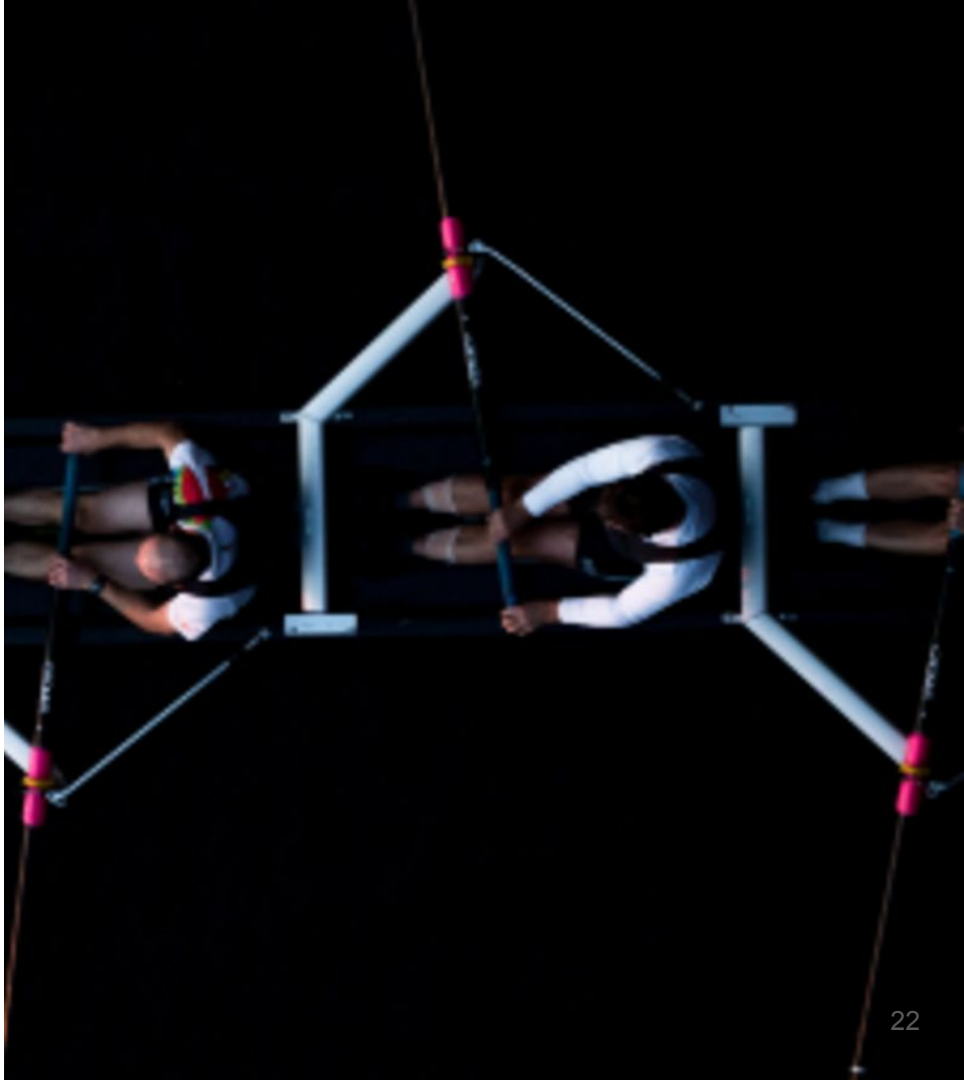
We take the **LONG VIEW** in customer and partner relationships

We learn well the **UNIQUE ASPECTS** of our customer's business

We assemble the **HIGHEST LEVEL** of internal expertise for each case

We focus on **SURPRISE-FREE** execution

This is our value.





WHAT IS YOUR CHALLENGE?

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