



# SME Expertise and Skills

in the 5G Domain

## Useful links

Find the SME you need

[www.networld2020.eu/find-the-sme-you-need/](http://www.networld2020.eu/find-the-sme-you-need/)

NetWorld2020 SME support

[www.networld2020.eu/sme-support](http://www.networld2020.eu/sme-support)

NetWorld2020 European Technology Platform

[www.networld2020.eu](http://www.networld2020.eu)

5G Public-Private Partnership

[www.5g-ppp.eu](http://www.5g-ppp.eu)



# EDITORIAL



JACQUES MAGEN

InterInnov

Chair of the SME Working Group



I am very proud to present the second edition of the brochure on “SME Expertise and Skills in the 5G Domain”. Like the previous version, it aims at showing the expertise and skills from selected European Small and Medium-sized Enterprises (SMEs) in 5G and related domains. This time, we are focusing more on the expertise that could be useful in various industry vertical sectors. Indeed, this is one of the major differences between 5G and the previous generations of mobile and wireless systems: 5G will be so pervasive that it will be used in a much broader landscape, addressing requirements from such sectors as automotive and transport, media and content, manufacturing and logistics, energy, health, and many others.

Small and Medium-sized Enterprises (SMEs) have an important role to play in developing, piloting and deploying 5G technologies, both to help with disruptive technologies and to address the needs of various vertical sectors. European SMEs have a great added value in providing innovative concepts and solutions that are having an important impact on the 5G value chain. They have the agility and flexibility required in a fast evolving technical and market landscape. This has been well understood within the 5G Public-Private Partnership (5G PPP), where SMEs have a 20% share. Since 2017, the Board of the 5G Infrastructure Association includes two SME representatives (out of 12 members).

This brochure aims at continuing to achieve SME participation in new projects looking further in terms of cooperation with vertical industry stakeholders, including but not limited to Phase 3 of the 5G PPP, looking at developing 5G platforms and large-

scale trials in various vertical industrial sectors. I am fully convinced that SMEs have a great added value in providing innovative 5G related concepts and solutions that could be used in various industry sectors. SMEs have the agility and flexibility that are required in a fast evolving technical and market landscape and are already working in many of those sectors. They are willing to work with larger industrial companies and research organisations to develop leading 5G solutions for the global market.

I would like to thank all my colleagues in the SME Working Group for their contribution and their hard work, and I am looking forward to seeing more and more European SMEs cooperate with European and non-European partners in the near future, for the development and deployment of 5G in various vertical industry sectors.

Please note that this brochure is complemented with a web page providing details on SME expertise in relation with 5G PPP Phase 3, entitled “Find the SME you need!”, that is available at [www.networld2020.eu/find-the-sme-you-need/](http://www.networld2020.eu/find-the-sme-you-need/).

*NetWorld2020 is the European Technology Platform for telecommunications and related services and applications. The SME Working Group is the networking place for SMEs. It helps promote SME activities and expertise (including but not limited to 5G) towards other stakeholders, in particular large companies. For more information on the activities of the SME Working Group, please have a look at [www.networld2020.eu/sme-support/](http://www.networld2020.eu/sme-support/).*



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# SUCCESS STORIES

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## CUMUCORE

Year established	2015
Number of employees	8
Website	<a href="http://www.cumucore.com">www.cumucore.com</a>
Contact email	<a href="mailto:info@cumucore.com">info@cumucore.com</a>

### Expertise in 5G

5G micro-services Service Based Architecture integrated with SDN orchestrator to provide Network slicing and Ultra Reliable Low Latency communication for Energy, Industrial and manufacturing Applications. Currently the 5G NGC core supports Clot which is integrated with Unified Device Management system. The eMBMS feature is also supported in NGC for media delivery and Critical Communications Services.

### Expertise in vertical sectors

Cumucore has expertise in network slicing based on SDN at networking layer. Network slicing orchestrator manages the network resources at Layer 2/3 based on VLAN tags and MPLS labels to guarantee low latency and high reliability network slice for Industrial Internet, media distribution or other mission critical applications like public safety. Cumucore provides the first deployment of 3GPP User Data Convergence (UDC) repository to manage NB-IOT devices and sensor data.

### Expertise in R&D and Innovation

Cumucore R&D team has been involved for over 15 years in cooperation with industry partners in projects such as MEVICO, SIGMONA, TAKE-5G and leading innovation in SDN used for mobile network management (SDN backhaul for mobility management WO 2015150638 A1)

Cumucore team contributed to standardisation First ITU ETSI Proof-of-Concept with SDN managed mobile backhaul (ETSI PoC #23)

Cumucore provides the cloud core network at the world-first Licensed Shared Access (LSA) pilot. The final results of the Italian pilot on the LSA were presented in Rome on 23rd September 2016. Potential interest in R&D and Innovation Cooperation

Cumucore has interest in 5G related R&I activities to ensure interoperability of their current products with other partners. Moreover, collecting requirements and needs from verticals in the areas of Industrial Internet, manufacturing, smart energy and NB-IOT services is important to mature Cumucore offering.

### Our unique selling point

Cumucore R&D team has expertise and available products in technologies such as 5G NGC, Network slicing (based on SDN), CIOT and eMBMS which can be tailored for different service needs based on customer/partner requirements. Cumucore can deliver early prototypes of new solutions based on their current product portfolio.



## FUTURE INTELLIGENCE

Year established	2009
Number of employees	10
Website	<a href="http://www.f-in.gr">www.f-in.gr</a>
Contact email	<a href="mailto:tmoysiadis@f-in.gr">tmoysiadis@f-in.gr</a>

### Expertise in 5G

Future Intelligence (FINT) is a Greek Telecom Engineering company with a mission to deliver innovative solutions for Next Generation Wireless Systems. Having deployed a WiMAX bubble to integrate heterogeneous UxVs' payloads (2013), and built a general purpose Cyber-Physical twin platform for IoT (2014) it now focuses on "softwarising" hardware and enabling on-demand, low-cost service offering (NFV, SDN) for 4/5G networks (since 2015). On the contrary, the company enhances edge-network "hardwarization" on top of its programmable net-FPGA Portable Cloud Platform that accelerates fronthaul network performance and distributes network processing (since 2017). Last, FINT's emerging IoT gateway would adjust multiple radio access interfaces (6LoWPAN, BLE, LoRa) to core 5G infrastructure.

### Expertise in vertical sectors

FINT has commercial deployments in Smart Cities and Smart Agriculture that will transform into cross-domain business cases. For the former, a network infrastructure based on outdoor LEDs is launched which is also capable to support Smart Cameras for Security and Parking purposes. For the Smart Farming case, smart sensor nodes feed a powerful gateway at the network edge with on-field sensors which can also host anomalies' detection from UAVs' Area Surveillance mission notably used for Forest Monitoring. In addition, NFV and SDN services may be offered to Telecom Operators to optimise their OPEX and improve the quality of services.

### Expertise in R&D and Innovation

FINT has rich experience in FP7, MED (INTERREG), SEE, Greek and UK national funds and of course H2020. The company has built a competitive, in-house RnD department which also delivers RnD services for and on account of the private sector.

### Potential interest in R&D and Innovation Cooperation

FINT would very much welcome collaboration on the convergence of front and backhaul network leveraging the edge IoT gateway capabilities. In addition, case-studies and pilots in certain verticals would be of high interest especially in the inclusive smart cities domain (transportation, energy, water) where citizens, businesses and authorities interact.

### Our unique selling point

The company was established as an RnD intensive SME but soon succeeded in exploiting such funds to build commercial products and services that are now enabling it to scale. As a result, FINT couples strong technical engineering competencies with the required soft skills to quickly identify the route to market and reach appropriate stakeholders following a win-win partnership approach.



# INCELLIGENT

Year established	2014
Number of employees	10
Website	<a href="http://www.incelligent.net">www.incelligent.net</a>
Contact email	<a href="mailto:info@incelligent.net">info@incelligent.net</a>

## Expertise in 5G

Incelligent is an Athens-based, dynamic SME, active in Europe, US and MENA region offering intelligent Predictive and Actionable solutions for Telecom Network/Service Providers and other Vertical industries. Its founders and workforce consist of senior telecom/ R&D engineers, highly competent software developers and data scientists. The main intellectual property of Incelligent is its modular, analytics software platform used -among others- in recent projects and pilots for:

- (a) Strategic planning and future evolution of 5G mobile networks,
- (b) Proactive customer experience management for Telco and Fintech,
- (c) network optimization in wireless networks.

## Expertise in vertical sectors

Incelligent products involve a sophisticated software system and separate software products based on big data analytics, state-of-the-art machine learning and artificial intelligence algorithms towards the provisioning of predictive and prescriptive solutions. Its domain-agnostic approach allows for versatility and easy deployment of solutions in various vertical sectors and CRM solutions. Recently, Incelligent has successfully developed solutions for the banking sector: (a) Customer 360 & micro-segmentation, (b) Targeted product recommendations, (c) Probability of default prediction and (d) Intelligent automated text classification of customer complaints.

## Expertise in R&D and Innovation

Incelligent's R&D and innovation actions are carried out partly through participation into various EU projects and through its involvement in standardization bodies. Currently, Incelligent participates in two 5G-PPP projects, namely MATILDA and 5G-PHOS, staying on top of current developments in the 5G ecosystem technologies. Indicative research domains are advanced analytics, state-of-the art machine learning algorithms, software defined networks, automation of resource management. Additionally, Incelligent is involved in various working groups and -among others- participates in the development and demonstration of an ETSI NTECH 5G PoC.

## Potential interest in R&D and Innovation Cooperation

Incelligent is always interested in cooperations with other organizations in the context of research projects, as well as product development, investing in R&I whether in the Telco sector or in vertical sectors. The company is highly interested in novel products and solutions that involve one or more of the following within the 5G ecosystem: Advanced Machine Learning and Artificial Intelligence solutions, autonomic resource management of wireless networks, smart marketing/ CRM solutions and IoT management solutions.

## Our unique selling point

We provide tailored, out-of-the-box solutions that utilize state-of-the-art Artificial Intelligence and Big Data technologies, going beyond simple analytics and offering in-depth insights, predictive as well as prescriptive analytics.



## INTEGRASYS

Year established	1990
Number of employees	25
Website	www.integrasys-space.com
Contact email	pedro.ruiz@integrasys-sa.com

### Expertise in 5G

IntegraSys is an SME engineering company specialized in the design, development and integration of Real Time software for network infrastructure (management, monitoring and control), service provisioning, and Operation System Support in the area of wireless, aerospace and mobile communications. The company also develops solution for automated measurement and certification systems in the telecommunication field.

### Expertise in vertical sectors

Integrasys provides solution in the following sectors:

- Satellite: Remote network monitoring and management, including own OSS tools with network virtualization. Integration with terrestrial network. Backhaul.
- Public Safety Communication: Secured communication of emergency situation, fast deployment, interoperable communication among robotics vehicles. Protection of critical infrastructure.
- Factories: WSN for harsh environment, including Factories and Power Plants.
- Media Delivery, content aware video delivery, hybrid broadcast (DVB-Tx /-Sx) and broadband (LTE) based on DASH. Video surveillance (H264 over Sat/terrestrial).

### Expertise in R&D and Innovation

We have experience for over 19 years in European R&D projects in consortia, working mainly as software developers and system integrators in the field of Mobile and Satellite Communications, Software and Services, and embedded platforms design and development. It is emphasized:

- H2020 ECSEL IoSENSE (2015-2018): To establish the base for increased manufacturing capacity for integrated sensors in Europe. Integrasys work on the connectivity part and IoT demonstrators
- H2020 AIOSAT (2017 - 2019): To develop a Safety Critical team tracking and communication solution for workers under high risk.
- H2020 RESISTO (2018-2021): Protection of Telecommunication infrastructure both from physical and cyberattacks

Integrasys has been participating in more than 20 R&D EU project from FP4.

### Potential interest in R&D and Innovation Cooperation

Improving our commercial products, network management, secured network, interference mitigation and management, harsh condition, Satellite Communication, safety critical, real time, NFV, SDN, SDR, mobile edge computing.

### Our unique selling point

- Expertise in this Telecom domain (more than 25 years working with main players in SatCom, Telecom Operator and ESA).
- Business impact and capacity to exploit the results, including internationalization out of EU (60% of our market is out of Europe, mainly US). This is seen as good point, especially considering we are a SME.
- Cross knowledge on integrated mobile terrestrial networks, WSN and Satellite networks.
- Application to domains as Security or Factories monitoring, Electric Plant, Railway... We can bring end users on these domains.
- Most of our products come from R&D projects, which is since as a very positive example of innovation.



# SUCCESS STORIES

## CUMUCORE

Cumucore successfully ran the first SDN based network slicing in Surrey 5G Innovation Center as part of SoftFIRE experimentation platform.

[www.softfire.eu/user-stories/oc2\\_5gnaas/](http://www.softfire.eu/user-stories/oc2_5gnaas/)

## INCELLIGENT

Incelligent has developed mechanisms for the proactive management of: (i) wireless broadband networks (applied currently in real network settings; leading to the US patent 9,942,085); (ii) the customer experience, which led to the attraction of interest/ investments from the FinTech (e.g., banking) sectors.

## INTEGRASYS

A company that has successfully commercialized products that were initially developed in EU R&D projects. EU based company whose main market is in USA, Latam, EMEA and Australia. Our products have been awarded four time in most prestigious forums of Satellite Communication in New York, Washington and London.

## INTERINNOV

InterInnov is a front runner in the Ecosystem Building of European R+I initiatives. Our team leads the SME Working Group and the Communication Channel of the whole 5G PPP Community, as well as the Outreach and Exploitation in 5G-MEDIA, the 5G project boosting the Media Industry.



## INTERINNOV

Year established	2009
Number of employees	5
Website	<a href="http://www.interinnov.eu">www.interinnov.eu</a>
Contact email	<a href="mailto:contact@interinnov.eu">contact@interinnov.eu</a>

### Expertise in 5G

CONNECT, DRIVE, COMMUNICATE -InterInnov is one of the key ecosystem builders of the European 5G landscape since 2013. Member of the NetWorld2020 Steering Board, the company chairs the Working Group focused on empowering the position of Small and Medium-sized Enterprises (SMEs). InterInnov is also a Board Member of the 5G Infrastructure Association and an active partner in projects from the 5G Public Private Partnership (5G PPP). Our scope includes coordination and support actions, research and innovation initiatives with an impact on vertical domains and international joint cooperation in the advancement of 5G with countries such as China and the USA.

### Expertise in vertical sectors

InterInnov assembles a large network of contacts at European and international level in the industry and public administration in various sectors. In the context of 5G, the company is a leading partner of the H2020 project 5G-MEDIA, one of the first initiatives targeting a vertical sector within the scope of the 5G PPP, in particular the Media Industry. We are responsible for the Dissemination, Communication and Exploitation efforts of this action.

### Expertise in R&D and Innovation

Our activities represent a benchmark in the Transfer of Technology, Ecosystem Building and International collaboration of the European R&D and Innovation landscape. Involved in the European Commission's Framework Programmes since it was established in 2009, the company has participated in a significant number of FP7 and H2020 projects, with a prominent role in initiatives related to Information and Communication Technologies (ICT), such as the 5G PPP, the Future Internet PPP and the Future Internet Research & Experimentation (FIRE) programmes.

### Potential interest in R&D and Innovation Cooperation

As a company specialised in Open Innovation, we permanently seek new opportunities for cooperation with our comprehensive network of stakeholders, which include industry, SMEs, academia and public administration. Our particular interest concentrates in initiatives where disruptive technology creates a positive impact for the society, such as the vertical sectors of Media, Smart Cities, Health, Transportation and Safety. In addition, we hold interest at international scale, contributing to build up joint agendas with reference countries in 5G such as the US, Canada, Taiwan, Brazil, Korea, China and Japan.

### Our unique selling point

Our value proposition is to transform the European powerhouse of Science and Technology into tangible results, getting Research and Innovation closer to the market and to the communities that can benefit or contribute to it, whether they belong to Industry, Academia, Public Administrations, or the Entrepreneurship and Innovation Ecosystems.



## INTERNET INSTITUTE LTD.

Year established	2014
Number of employees	3 + 9 Associates
Website	<a href="http://www.iinstitute.eu">www.iinstitute.eu</a>
Contact email	<a href="mailto:janez.sterle@iinstitute.eu">janez.sterle@iinstitute.eu</a>

### Expertise in 5G

INTERNET INSTITUTE Ltd. (ININ) is an innovation-intensive SME, specialized in QoS and QoE measurement solutions, quality assurance systems and services, and emergency response and intervention management tools for public safety needs. We have expertise in 5G performance and quality metrics development and validation, 5G benchmarking and end-to-end KPIs validation, and quality monitoring and SLA assurance for orchestrated 5G infrastructures and services. Also, we are experienced in design and deployment of reliable and resilient 5G infrastructures for public safety needs.

### Expertise in vertical sectors

ININ addresses telco, corporate and vertical industrial sectors with their qMON portfolio for quality monitoring and SLA assurance, benchmarking and end-to-end validation of communication infrastructures and services. In addition, we specialise in design, development and integration of on-site and backhaul critical communications solutions and intervention monitoring tools and apps for the public safety sector. We cooperate tightly with PPDR practitioners and we are involved in several R&D and piloting projects addressing the delivery of future proof communication systems, services and apps for 112 and emergency response needs.

### Expertise in R&D and Innovation

ININ is active in R&I and industrial projects domain and is part of the 5G PPP Phase 2 programme (project MATILDA, [www.matilda-5g.eu](http://www.matilda-5g.eu)). We work on monitoring and QoS and QoE evidence collection capabilities in the 5G-orchestrator solution. Also, we are involved in planning and implementation of 5G vertical use cases for the emergency response domain, including piloting in realistic environments in joint cooperation with PPDR practitioners.

### Potential interest in R&D and Innovation Cooperation

Our particular interests for upcoming 5G research are: quality assurance of mobile, fixed and cloud systems, including 5G performance and quality metrics development and validation, 5G testing, benchmarking and 5G end-to-end KPIs validation; quality monitoring and SLA assurance for 5G infrastructures and services; and R&I and piloting of resilient real-time 5G critical infrastructures, and specialised 5G deployments for public safety, automotive and intelligent transport, and smart grid verticals.

### Our unique selling point

We practice R&I in tight cooperation with end-users and practitioners, leading to real-world piloting and actual deployments in practice.





## IS-WIRELESS

Year established	2006
Number of employees	15
Website	<a href="http://www.is-wireless.com">www.is-wireless.com</a>
Contact email	<a href="mailto:info@is-wireless.com">info@is-wireless.com</a>

### Expertise in 5G

IS-Wireless develops algorithms, protocols, and tools for 4G and 5G mobile networks. We provide licensable software in the two following areas: 1) NFV-compatible, standard-compliant RAN protocols ready for evolution to 5G. The product is named Software-Defined RAN. This allows mobile networks to support more users with better performance at lower cost. 2) Experimentation solutions- the 5GToolset supporting research and education on 4G and 5G. Our ambition is to bring 4G and 5G innovation for every university and research lab worldwide at affordable prices.

### Expertise in vertical sectors

One of our first projects was the design and implementation of a complete broadband access system for one of the providers of Polish Ministry of Defense. This shows our capabilities within the public safety vertical sector.

### Expertise in R&D and Innovation

We are experts in the following areas: Baseband PHY waveforms and algorithms for LTE, LTE-A and 5G, eNB and UE L2-L3 protocols, SDN and NFV in RAN, Radio resource management for LTE, LTE-A and 5G, link-level and system-level simulations of wireless systems.

IS-Wireless is an active participant of collaborative research projects on 4G, 5G and beyond, within 5G-PPP, H2020 and FP7 projects.

### Potential interest in R&D and Innovation Cooperation

We are looking for partners willing to collaborate in: (i) development of 5G small cell protocols and radio resource management solutions for 4G/5G and cloud-RAN (ii) delivering cyber security solutions for 4G/5G small cells. We look forward to cooperate with verticals (media, IoT/automotive, public safety) as we have our proprietary solutions for virtualized RAN that can be tailored and further adjusted per use-case.

### Our unique selling point

IS-Wireless aims to become the leading global software partner for the LTE/5G base station ecosystem by delivering cutting edge radio protocols and signal processing algorithms.





Year established	1996
Number of employees	60
Website	<a href="http://www.itti.com.pl">www.itti.com.pl</a>
Contact email	<a href="mailto:Krzysztof.Samp@itti.com.pl">Krzysztof.Samp@itti.com.pl</a>

## Expertise in 5G

The main competences of ITTI related to 5G are in PHY layer (channel coding, modulation, signal processing, synchronisation) and MAC layer (admission control, congestion control optimization), cognitive resource control and service adaptation (cross-layer, context driven, machine learning based, QoE/QoS), network and cybersecurity, test campaigns (e.g. video systems, mobile data services) and validation by means of system/link level simulators (LTE, WIMAX).

## Expertise in vertical sectors

Our expertise covers eHealth, energy, and public safety vertical sectors. We developed Medstar.co solution that offers telecare support for remote patients. In the energy sector, we worked on optimal control for smart cities (e.g. light control, energy management). We also have extensive expertise in economic evaluation of PPDR networks and social media usage in crisis management within the public safety sector.

## Expertise in R&D and Innovation

ITTI has over 15 years of experience in numerous EC funded projects – starting from FP5 to H2020 presently . We also carry out R&D projects for European Defence Agency (EDA) and European Space Agency (ESA). Besides the interest in ICT, our company has significant expertise in sensor systems, data analysis and visualisation, simulations in crisis management, lessons learnt systems (knowledge management), security (cybersecurity, CBRN protection), biometrics, and space technologies and research.

## Potential interest in R&D and Innovation Cooperation

Having a competent and experienced team of telecommunication engineers and software developers, ITTI is interested in collaboration with partners on development of innovative solutions for vertical sectors in the 5G ecosystem. In particular, we are interested in integrating novel technologies to our eHealth Medstar.co solution to enhance its functionality leveraging 5G capabilities. We are also seeking partners for collaboration on security solutions for 5G networks.

## Our unique selling point

We develop software solutions and innovative applications driven by our longtime and rich experience and interest in R&D activities, particularly in the area of ICT and security.



# SUCCESS STORIES

## INTERNET INSTITUTE

INTERNET INSTITUTE is now recognized as trusted partner in the 5G quality assurance and public safety domain, collaborating with various industrial, public and research partners.

## IS-WIRELESS

Since 2012 IS-Wireless has participated in competitive R&D projects funded by EU.

## ITTI

ITTI has contributed to over 50 international R&D projects in the EC Framework Programmes (5FP, 6FP, 7FP, H2020), EDA programmes and ESA programmes.

## LIONIX INTERNATIONAL

LioniX International has secured a seven-figure contract for the development and fabrication of integrated photonic modules that enable ultra-high capacity broadband satellite communications from flat-panel aeronautical antennas. This contract with ViaSat Antenna Systems S.A. is part of the ESA project AIDAN and follows years of intensive research and development.

## MARTEL INNOVATE

Orchestra Cities is Martel's Smart City platform, which was selected among the five top ones (ranked #2) by a Pre-Procurement Action run by Antwerp, Copenhagen and Helsinki. Through several iteration rounds, the platform is now maturing into a solution that allows the collaborative creation of Smart Cities involving different stakeholders through Open APIs and Open Data. Martel is now in discussion with several municipalities and companies in the Smart City market willing to leverage on this platform for effective, flexible and scalable smart city services offering and management.

## LIONIX INTERNATIONAL

Year established	2001
Number of employees	53
Website	<a href="http://www.lionix-international.com">www.lionix-international.com</a>
Contact email	<a href="mailto:p.w.l.vandijk@lionix-int.com">p.w.l.vandijk@lionix-int.com</a>

### Expertise in 5G

LioniX International develops integrated microwave photonics (iMWP) solutions, in particular integrated photonic modules, optical beamforming networks (OBFN), that enable ultra-high capacity broadband communications from flat-panel antennas for mmWave satellite, aeronautical and 5G terrestrial applications. Our core technology is based on hybrid integration of high-contrast, low-loss, silicon nitride photonics, called TriPleX™, with an Indium Phosphide (InP). This platform provides small, integrated modules with novel RF-functions such as, switches, filters, true-time-delay-lines, WDM and more. We are partner in H2020 5G-projects blueSPACE and 5GPHOS.

### Expertise in vertical sectors

We provide customized solutions for OEM's and System Integrators, from design to fully assembled modules, by vertical integration and in scalable production volumes. We maintain our technology leadership secured by a strong IP position. LioniX International focuses on Photonic Integrated Circuits (PIC) enabled modules based on its proprietary waveguide technology (TriPleX™), in addition to its other core competences micro-fluidics, opto-fluidics and MEMS.

Our PIC modules and additional competences can be used in a suite of applications in Telecom/Datacom, Life Science, Metrology and is offered as well in our technology services.

### Expertise in R&D and Innovation

Our proprietary TriPleX™ platform enables hyper-spectral (400-2350 nm) Photonic Integrated Circuits. Research and Development focusses on integration of configurable integrated photonics functionality, using piezo-based low-power actuation, also co-

developed in the H2020 EU projects HAMLET and 3PEAT. Other joint research envisions further improvements towards mmWave performance. Our PIC modules are developed for different types of products in Life Science applications, like confocal microscopy, flow cytometry, Optical Coherence Tomography (OCT), endoscopy, spectroscopy, optical biosensors, food sorting, flowcytometry and molecular diagnostics.

### Potential interest in R&D and Innovation Cooperation

Applications of broadband mmWave RF and integrated microwave photonics technology in terrestrial and space. Different types of products for metrology applications such as: laser interferometry (homodyne, heterodyne and multiwavelength detection), optical coherence tomography (OCT) and spectrometry. Integration and miniaturization of photonic sensing for industrial, telecom and life science applications in the hyper spectral region from 400 nm – 2350 nm for optical metrology, to measure distances, surfaces or motion. Application of our PICs increases robustness, reliability and compactness and may provide new methods of measuring.

### Our unique selling point

We provide customized solutions for OEM's and System Integrators, from design to fully assembled modules, by vertical integration in scalable production volumes. Our PIC modules and additional competences can be used in a suite of applications in Telecom/Datacom, Life Science, Metrology and is offered as well in our technology services. We maintain our technology leadership in silicon nitride, low-loss technology secured by a strong IP position.





## LIVEU LTD

Year established	2007
Number of employees	200
Website	<a href="http://www.liveu.com">www.liveu.com</a>
Contact email	<a href="mailto:baruch@liveu.com">baruch@liveu.com</a>

### Expertise in 5G

Using Multi-link (“bonding”) in 5G.

Member of 5G-Xcast H2020 project, a 5GPPP Phase II project focused on Broadcast and Multicast Communication Enablers For the Fifth Generation of Wireless Systems. <http://5g-xcast.eu/>

Member of the Health^5G Celtic project <https://www.celticplus.eu/project-health5g/>

Member of the 5G-IA Trials WG

### Expertise in vertical sectors

Media, TV, broadcasting, online video,

Public safety, police and border protection

Connected car and autonomous cars

LiveU has been driving the live/real-time video revolution, providing real time video and data “bonding” multiple links over any IP-based technology. LiveU enables broadcasters of all sizes to acquire and share live video reliably on any viewing platform – TV, social (Facebook etc), web, OTT, proprietary etc. With over 2,000 customers in 80+ countries, LiveU’s technology is the solution of choice for global broadcasters, online media, news agencies and social media to cover breaking and developing news and high-profile events.

Also serving the public safety and government vertical for real time mobile surveillance, situational awareness, search and rescue, disaster management, telemedicine and others.

LiveU is involved in the Connected Car and autonomous vehicle verticals, providing real time video connectivity from the vehicle.

### Expertise in R&D and Innovation

Algorithms, software, hardware (our own devices) and RF development engineers and experts.

In video (including HEVC H.265), cellular, satellite, wireless, cloud-based operation and other disciplines.

Facility, well-equipped lab, and worldwide operation over multitude of real life operators’ networks.

### Potential interest in R&D and Innovation Cooperation

Looking for cooperation in research and projects in 5G multilink, converged networks, video/media delivery.

Projects under future calls in H2020 and others, in media, trials, public safety, health, connected cars and smart transportation, secure cities etc.

### Our unique selling point

Innovator, strong R&D, global presence in professional media, daily work with cellular (and any IP connectivity including WiFi and satellite) and video.







## MARTEL INNOVATE

Year established	1996
Number of employees	16
Website	<a href="http://www.martel-innovate.com">www.martel-innovate.com</a>
Contact email	<a href="mailto:info@martel-innovate.com">info@martel-innovate.com</a>

### Expertise in 5G

Martel is an innovative and dynamic SME specialized in the management, innovation and promotion of international Research and Innovation projects with focus on Next Generation Internet technologies, such as 5G, IoT and Cloud. It has been involved in the 5G PPP initiative since its inception, with the Euro-5G and now To-Euro-5G projects and it's an active member of the 5GIA, Networld2020, FIWARE Foundation, BDV, AIOTI, IoT Forum, and NEM.

Martel Lab, the R&D department, is specialised in virtualisation and orchestration of virtual resources, including IoT functions and Virtual Network Functions.

### Expertise in vertical sectors

MARTEL is currently active in Manufacturing, Smart Cities and Media verticals. MARTEL is leading the development of Orchestra Cities: a collaborative smart city platform through which cities and citizens can share: data, sensors, standards and solutions. MARTEL, as member of the FIWARE Foundation, is developing a Zero Break-downs/Defect Manufacturing solution, based on the first open source implementation of the Industrial Data Space Architecture (IDS). Finally, MARTEL is involved in the development of an integrated software platform that provides a leap forward for media delivery over a 5G-enabled programmable infrastructure.

### Expertise in R&D and Innovation

Martel's team has more than 20 years of experience in R&D&I EC funded projects, with strong connections with many key European and Global (USA, China, Mexico, Brazil) ICT players. Martel Lab, the R&D department, is specialized in cloud native architectures, spanning from cloud computing infrastructures based on Open Source solutions such as OpenStack and Kubernetes, to cloud computing as an enabler in the development of highly available, scalable and resilient services for Big Data, Media, Internet of Things, Virtual Network Functions and Smart Cities.

### Potential interest in R&D and Innovation Cooperation

We are particularly interested in bringing additional innovations and integrating novel technologies to our products in the verticals of Smart City and Industry 4.0. In particular, we are happy to explore behaviour of our platforms when combined with 5G networks, and to explore the deployments of both platforms on top of innovative 5G infrastructures. Our interest is in general on the convergence between IoT management solutions and 5G and usage of micro-services architectures in the context of 5G. We are able as well to bring potential usage scenarios in the context of automotive/transport (based on fleet management), smart cities (including 2 cities, different scenarios are possible) and industry 4.0 (manufacturing and logistic).

### Our unique selling point

MARTEL offers a comprehensive value driven approach supporting all innovation life cycle stages from ideas definition, funding, management, prototyping and development, communication to launch to market. Our international team of highly skilled professionals offer a unique combination of business, technology and media services competences.



## MOLTOSENSO

Year established	2009
Number of employees	7
Website	<a href="http://www.moltosenso.com">www.moltosenso.com</a>
Contact email	<a href="mailto:info@moltosenso.com">info@moltosenso.com</a>

### Expertise in 5G

moltosenso has developed a unique versatile hardware/software platform, for fast and cost effective deployment of networked Smart Things. moltosenso Plug&Play patented architecture has already been awarded through a European SME Instrument Phase 1 grant, recognized as one of the most promising ICT disruptive innovation in the Wireless Sensor Network (WSN) and Internet of Things (IoT) landscapes.

As ICT integrator, moltosenso owns expertise regarding IoT system design into complex and heterogeneous transmission environments (protocol stack and medium choice, data rate, allowed latency, system costs, energy consumption, data security, etc.).

Owning its DPO (Data Protection Officer) team and its own privacy experts, moltosenso develops services and systems compliant to privacy issues by design and by default, supporting partners of any kind and consortiums to adhere to GDPR. 5G will have to deal soon with requirements of millions of IoT devices, privacy included, making moltosenso's compelling expertise essential.

### Expertise in vertical sectors

moltosenso has developed IoT systems, services and expertise in the following vertical sectors:

- health-care (an innovative diaper monitoring solution, called DiapSense);
- waste management (smart bins collection, trucks route optimization, bins positioning best planning, opportunistic bins inter-networking through passing-by of trucks);
- industrial processes monitoring (real time transmission in harsh environment);
- structural monitoring (Holy Shroud Chapel vibration continuous monitoring and real time data transmission).

### Expertise in R&D and Innovation

moltosenso has a long experience in R&D projects, since FP6, throughout H2020 and Regional/National projects. moltosenso allocates high percentage of its yearly revenue to new investments on R&D activities, that span from new architectural ICT solutions, to novel algorithms and services.

### Potential interest in R&D and Innovation Cooperation

moltosenso, as both system integrator and data analysis service provider, aims at expanding the profile and usage of its solutions worldwide, with fruitful partnerships devoted to integration and innovation.

### Our unique selling point

Systematic approach to solve problems regarding monitoring, data analysis, optimization and privacy compliance, in challenging context, as 5G will be.

## MONTIMAGE

Year established	2004
Number of employees	12
Website	<a href="http://www.montimage.com">www.montimage.com</a>
Contact email	<a href="mailto:contact@montimage.com">contact@montimage.com</a>

### Expertise in 5G

Montimage specialises in the development of techniques and tools for security and performance analysis and management of 4G/5G SDN/NFV-based networks using real-time monitoring techniques. It provides Security as a Service and Software Defined Security and Monitoring solutions. Montimage's expertise covers the detection, prevention and mitigation of cyber-security incidents in both the data and control planes. Its security management solution allows deploying and configuring monitoring agents to analyse network behaviour using DPI and AI techniques.

### Expertise in vertical sectors

Montimage's solutions have been applied to improve the resiliency and trustworthiness of complex systems and adapted to different domains, including: automotive/transport, manufacturing/industry, health, telecommunications, critical infrastructures... Its solutions can be extended to deal with proprietary protocols and analyse the behaviour and business activities of the different sectors.

### Expertise in R&D and Innovation

Montimage participates in many collaborative research projects that allow introducing innovative techniques into its products. For instance:

SISSDEN H2020 project where it analyses darknet and honeypot network traffic to detect low-intensity attacks and evasion techniques.

SENDATE CelticPlus project where it defines and implements new techniques for managing the security of SDN/NFV-based networks.

ANASTACIA H2020 project where it implements new solutions for IoT network security.

### Potential interest in R&D and Innovation Cooperation

Montimage is actively searching for new partnerships and collaborations (research and innovation, joint ventures, etc.). It can bring its technical knowhow and tools as well as its experience in the participation and management of projects in different research programs (H2020, ITEA3, CelticPlus...).

### Our unique selling point

Montimage has deep knowledge of network and application protocols and behaviour; and, its products are completely build in-house. In consequence, they are trustworthy, adaptable, reliable, robust and can deal with high throughputs and complex systems. Can rapidly provide proofs-of-concepts adapted to specific needs.



## NEXTWORKS

Year established	2002
Number of employees	45
Website	<a href="http://www.nextworks.it">www.nextworks.it</a>
Contact email	<a href="mailto:info@nextworks.it">info@nextworks.it</a>

### Expertise in 5G

Nextworks has a long-term experience in 5G control and orchestration technologies, built on top of a solid know-how of ETSI NFV and MEC specifications and architectures, and deep software hands-on expertise with various NFV MANO tools (ETSI OSM, OpenBaton, Open Source MANO, Tacker), SDN controllers (OpenDaylight, ONOS), VIMs (OpenStack), and MEC applications catalogue and orchestrator. We have developed various solutions for SDN-based control and orchestration of VNFs and Network Services in 5G environments, both proprietary and open-source. We also have strong involvement in SDOs, particularly ETSI NFV and MEC where we have been supporting Specialist task forces and organization of Plugtests.

### Expertise in vertical sectors

Nextworks develops products in technology domains that are closely related to four 5G verticals: Media, Energy, FoF and Smart Cities.

The baseline product family is “Symphony”, a modular Building Management System and digital living platform which integrates home automation, security, multimedia entertainment and communications. Nextworks is currently evolving its Symphony middleware from a “home” platform into a more platform for Smart Cities and Smart Factories, deploying various virtualized functions distributed at the smart facility, at the edge and in the cloud.

### Expertise in R&D and Innovation

Nextworks is participating in several H2020 projects on 5G (5G-Crosshaul and SELFNET from 5G PPP Phase 1, 5G-Transformer, SLICENET, 5G-City, 5G-MEDIA and BlueSpace from 5G PPP Phase 2), coupled with activities on 5G Verticals industries like IoT and Factory of the Future in the SYMBIOTE, MONROE and COMPOSITION projects. Quite often NXW successfully covers roles of Technical Management, WP and task leader for the activity items of specific expertise.

### Potential interest in R&D and Innovation Cooperation

Nextworks always aims to carry out its R&D activities in cooperation projects with key players (especially operators, vendors and top industries in the targeted Verticals) from different countries. Our objective is to build a stronger and better-focused technical know-how, adequately complemented by a business perspective.

### Our unique selling point

Our mission is to provide cutting-edge solutions fully tailored to our customers’ needs. Our current focus is on 5G, Network Function Virtualization, Internet of Things, Factories of the Future.

Our best R&D success stories. Our background on 5G, NFV, MEC allowed us to sell Technical Project Management services to Open Fiber and lead the Project Management Office of the 5G experimentation in Prato (Italy). We won contracts with ETSI to lead two Specialist Task Forces, one for NFV Gap Analysis with OpenStack APIs, the other for MEC Testing Framework development. We also won contracts for the execution and reporting of the 2nd and 3rd NFV Plugtest at ETSI Headquarters.

# SUCCESS STORIES

## MONTIMAGE

Montimage has successfully deployed its solution in the SoftFire platform (Software Defined Networks and Network Function Virtualization Testbed within FIRE+, [www.softfire.eu](http://www.softfire.eu)) to improve the security-awareness of the operators. It has also started a joint collaboration with CumuCore to commercialise 4G/5G mobile solutions in a box.

## MOLTOSENSO

moltosenso Plug&Play patented IoT architecture has been awarded with an European SME Instrument Phase 1 grant, recognized as one of the most promising ICT disruptive innovation in the Wireless Sensor Network and Internet of Things landscapes.

## NEXTWORKS

Our background on 5G, NFV, MEC allowed us to sell Technical Project Management services to Open Fiber and lead the Project Management Office of the 5G experimentation in Prato (Italy). We won contracts with ETSI to lead two Specialist Task Forces, one for NFV Gap Analysis with OpenStack APIs, the other for MEC Testing Framework development. We also won contracts for the execution and reporting of the 2nd and 3rd NFV Plugtest at ETSI Headquarters.

## NOUVEAUCOMM

Design and Development of Remote Server Monitoring System with IoT gateway

## POWER-OPS

At its second year, Power Operations made it to the final quartet in the EC Innovation Radar Prize 2017, in the category of Industrial & Enabling Tech, clearly placing Power Operations among the four most prominent companies in Europe for 2017 in this category.

## OPEN CELLS

OpenAirInterface is now quite successful with members such as Nokia, Cisco, Orange, Facebook, TCL ... and Open Cells is proud of counting most of them as customers for our services and products.



## NOUVEAU COMM

Year established	2014
Number of employees	6
Website	<a href="http://www.nouveauctomm.com">www.nouveauctomm.com</a>
Contact email	<a href="mailto:navnit.goel@nouveauctomm.com">navnit.goel@nouveauctomm.com</a>

### Expertise in 5G

We help companies to strategize ahead, in this era of unprecedented fast changes in technology and evolving customer requirements. We help you by providing business analysis and follow through with implementation. Our capabilities include End to End Project life cycle and delivery System Architecture, Software Development and Test Services.

### Expertise in vertical sectors

Our modular architecture ensures that our systems can be customized for application in various verticals like Manufacturing Industry, Telecom Services providers, Healthcare, Smart Cities, public safety and tactical communication.

### Expertise in R&D and Innovation

Our team members having worked with MNCs like Alcatel-Lucent and Bell labs have experience of designing globally deployed 3G and 4G systems. We provide innovative products and solutions in wireless & fixed line access, IP and cloud networking, NFV and Software Defined Networks.

### Potential interest in R&D and Innovation Cooperation

We help customers to define 3-5 years roadmap, End to End System Architecture, Software Development and hardware design for manufacturability, System Integration and Validation, Functional, performance, Load & Stress Test, Regulatory Compliance Certification, Radio & Protocol conformance and Test automation.

### Our unique selling point

Our Modular design approach with roadmap for future enhancements and cost effective solutions.

# Open Cells Project



## OPEN-CELLS

Year established	2016
Number of employees	1
Website	<a href="http://www.open-cells.com">www.open-cells.com</a>
Contact email	<a href="mailto:contact@open-cells.com">contact@open-cells.com</a>

### Expertise in 5G

We developed 4G SDR, as a member of OpenAirInterface.

We created the idea of the OpenAirInterface Alliance as a 5G enabler.

Our product is today mainly 4G SDR, nevertheless the OAI community contributes and many 5G pieces are available now.

Our OAI distribution offers more stability and propose a set of features to enable our customers to make their own features.

### Expertise in vertical sectors

We expect vertical sectors as our main customers, as this market need a 4G and 5G operation network for their testbeds.

### Expertise in R&D and Innovation

We developed the performance critical pieces of code in OpenAir: turbo codec. Compared to the legacy OAI implementation (that was already using SIMD instructions) we improved the performance by more than x10 on this critical component. So, now OAI eNB and UE can run on a decent PC in realtime.

Another of our major contribution to OAI is a complete refactory of the binary production system, based now on cmake tool.

The company owner has been a researcher and a research director in Bell Labs. His contributions are in cellular network optimization and in eUICC (embedded SIM).

### Potential interest in R&D and Innovation Cooperation

We are eager to participate to any project that require a 4G/5G network.

We can provide the cellular network and the project specific features inside.

### Our unique selling point

Existing asset: whole 3GPP SDR system: HSS P+S-GW, MME, eNB, UE, SIM cards, ...



## POWER-OPS

Year established	2015
Number of employees	7
Website	<a href="http://www.power-ops.com">www.power-ops.com</a>
Contact email	<a href="mailto:artemis@power-ops.com">artemis@power-ops.com</a>

### Expertise in 5G

Power Operations is an innovative startup delivering specialized IT services for the energy sector under energy efficiency and security contexts and has a long experience in relevant R&D projects and initiatives. In such framework, Power Operations exhibit significant expertise in cloud-based architectures and platforms used under the 5G/SDN umbrella including various cloud management frameworks (e.g. Openstack, Kubernetes), ETSI NFV tools (ETSI OSM, Openstack Tacker) and is currently designing MEC-oriented VNFs to be used in the energy sector, in the context of the 5G PPP Phase 2 project NRG-5.

### Expertise in vertical sectors

The members of Power Operations have a long-lasting experience in the development of products targeting at the energy sector, particularly targeting at energy efficiency strategies in the context of smart cities, focusing on both industries and end-users. The result of this expertise has been materialized in the form of the PowerOps Platform, a business framework allowing Utilities to use a domain specific big data stack tailored for business intelligence on smart energy grids. During the past year, Power Operations has been evolving its platform to support Blockchains technology, in an attempt to unlock the potential of a lock-in free environment for end-users and utilities.

### Expertise in R&D and Innovation

Power Operations actively participate in 3 EC R&D and Innovation projects pertaining to the application of the Blockchains technology on the energy domain, including 5G PPP Phase 3 project NRG-5, H2020 DEFENDER and H2020 CATALYST. Besides these projects, the members of Power Operations have a long experience in R&D projects in previous framework programmes as well as PPP programmes (e.g. FI-PPP). It should be noted that Power Operations was initially founded to exploit the developments of its mother company (Synelxis Solutions Ltd) from the FP7 DOLFIN and the FI-PPP FINSENY and FI-PPP FINESCE projects.

### Potential interest in R&D and Innovation Cooperation

Power Operations considers cooperation in R&D and Innovation activities as a perfect vehicle for further extending its technology and expanding the horizon of its members. Definitely specialized on delivering Blockchain solutions for the energy sector, relevant cooperation and coordination activities are rigorously pursued, as are activities that fall close in this context.

### Our unique selling point

We have the knowledge, the expertise and the way to make the energy sector a more secure and more resilient and more open to new technologies and opportunities.





## QUOBIS NETWORKS SL

Year established	2006
Number of employees	38
Website	<a href="http://www.quobis.com">www.quobis.com</a>
Contact email	<a href="mailto:yudani.riobo@quobis.com">yudani.riobo@quobis.com</a>

### Expertise in 5G

Quobis has strong expertise on UC solutions based on SIP and WebRTC technologies like testing and development of real time media-specific applications, development of multi-tenant application environments which can be connected to lower levels of 5G architecture, developments of applications of Cortical Learning Algorithms to communication networks and Smart Grid networks.

Quobis is currently taking part of one of the 5G-PPP phase 2 projects: 5G TANGO.

### Expertise in vertical sectors

Quobis can provide expertise in business processes communications (like multi-conferencing, image and video sharing, data collection, emergencies support, push notifications, easy adoption by elderly people, call recording, video streaming, etc) for several vertical sectors like media and entertainment, automotive, smart cities or health.

### Expertise in R&D and Innovation

Quobis has been involved in national and international R&D projects related to voice and multimedia technologies like RIC@S, AV2VISES, ICARUS (FP7-SEC-2011-1), EMC2 (ARTEMIS-2013-1), reTHINK (H2020-ICT5-2014), 5GTANGO (H2020-ICT-2016-2), LEAN (CELTIC-2017), MUSIC (PENTA-2-2017), etc. In addition, some tasks were also carried out in several regional or national R&D projects regarding voice interconnection, security and new services over NGN networks like MEET, Sat2Car, 5iGO, etc.

### Potential interest in R&D and Innovation Cooperation

Quobis has broad experience working on international projects funded and not funded by public agencies as is a key partner for some of the larger network integrators and service providers that see Quobis as the reference partner for projects with special needs in UC. We are interested in collaborating in ICT related H2020 calls providing our R&D capabilities in cooperation with international partners.

### Our unique selling point

Since its foundation, Quobis has accumulated extensive experience in the implementation and deployment of solutions based on core technologies for corporations, service providers and telcos. Quobis has gained extensive knowledge of mobile networks, interconnection and WebRTC technology from partnerships with the primary equipment vendors, where it deployed end-to-end solutions, for both transport and access networks.



## REAL-WIRELESS

Year established	2007
Number of employees	15 + 30 Associates
Website	<a href="http://www.real-wireless.com">www.real-wireless.com</a>
Contact email	<a href="mailto:simon.fletcher@real-wireless.com">simon.fletcher@real-wireless.com</a>

### Expertise in 5G

Real Wireless has been at the forefront of Research and Innovation in 5G. We focus on the development of techno-economic capabilities, infrastructure investment viability, business model innovation and Innovation Management. Real Wireless has participated in 5G-NORMA in 5G-PPP Phase1 and now in leading Economic Analysis in 5G-MoNArch. We have an extensive portfolio of analytic tools based on proprietary modelling and simulation capabilities that provides deep insight to our clients when combined with the market leading expertise of our advisors and consultants.

### Expertise in vertical sectors

Ever since the creation of Real Wireless we have been practicing in the venues and enterprise wireless users segment. Our long standing experience gained through working with one of key clients (Wembley Stadium) has enabled us to develop a business that not only provides strategic wireless advice to venues but also transport systems. We have advised private and government clients on their investment strategies to develop their services and through mechanisms such as slicing how their service provider or tenant (virtual network operator) models can evolve.

### Expertise in R&D and Innovation

We have developed a highly capable tool (CAPisce) through the 5G-NORMA and 5G-MoNArch projects. This has required the development of complex traffic demand simulation capability, which stimulate the creation of a synthesised network build for complex techno-economic scenario evaluation.

### Potential interest in R&D and Innovation Cooperation

We are seeking to extend our business in the European market and beyond. We bring a strong techno-economic and business modelling expertise to projects and have established a strong collaborative and consultative model that enables us to rapid deploy, employing agile methods and scenario analysis that enables project to consolidate and establish proof points for the value of innovations.

### Our unique selling point

Deep practitioner experience through consulting practices in the verticals as well as in the wireless industry and emergent technologies. A unique combination of deep knowledge enhanced by proprietary AI oriented tooling.





## RFSAT

Year established	2011 (UK) and 2018 (Ireland)
Number of employees	10
Website	<a href="http://www.rfsat.com">www.rfsat.com</a>
Contact email	<a href="mailto:general@rfsat.com">general@rfsat.com</a>

### Expertise in 5G

RFSAT and its employees have been in the forefront of mobile communications technology development since over 20 years, starting with the first 3G basestation built in FP5 project back in 1999. Since then it has contributed to developing successor technologies constituting current 4G (LTE and LTE+) and has been involved in developing core technologies as well as value-added services for the future 5G communications. Its main relevant technical competencies relate to hardware efficient transceiver design and implementation, network virtualisation, low-latency networking, network/client-assisted positioning/localisation and security-sensitive services.

### Expertise in vertical sectors

Since over 8 years RFSAT has been focussing its research and technological developments on such vertical sectors as communication, e-Health, environment, transportation, smart cities, smart energy and utility grids and public safety including crisis management. Services are generally focussed on distributed sensing and control (involving sparse Big Data management and IoT technologies) over variety of communication and networking transports for providing added value to mobile users and geographically dispersed enterprises. With its real-time technologies RFSAT has targeted also media virtualisation, such as Mixed-Reality Immersion, demonstrated for real-life e Health and crisis management applications.

### Expertise in R&D and Innovation

RFSAT considers research consultancy and development as core business, actively taking part in European and international funded research projects since its incorporation. It has participated in over six (6) projects as core partner and over ten (10) as associated and/or as SME group member. Funding programs include FP6, FP7, Horizon 2020 and COST Actions. It has been operating several industrial consultancy contracts for both academia and industries in UK and across Europe.

### Potential interest in R&D and Innovation Cooperation

RFSAT is dedicated to extending its collaboration portfolio and establishing working relationships both through funded research & development activities (e.g. Horizon 2020 or other programs) and industrial consultancy, as well as non-funded research liaisons. We also see an opportunity for possible commercial exploitation of some of our technologies that have been developed in past and ongoing projects, both funded and self-funded.

### Our unique selling point

RFSAT is a flexible SME with expertise and capabilities in a variety of technologies constituting future communications with experience in different vertical sectors gained from past and ongoing European funded projects. Its technologies are diverse and seamlessly applicable across multiple sectors. Examples include sensing & control as well as Mixed-Reality technologies used successfully in e-Health, Smart Grids and Security applications, certainly with certain adaptations. RFSAT has proven itself to quickly respond to dynamically changing user needs and has always been in the forefront of the technological progress on the global market.



# SUCCESS STORIES

## REAL-WIRELESS

Within H2020 5G-NORMA the leadership and delivery of a comprehensive techno-economic assessment of the architecture innovations that will impact the development of the industry for the coming 10 to 15 years.

## RFSAT

Mixed-Reality rehabilitation system for stroke patients (FP7-StrokeBack) integrated into mobile product from MAYTEC. More details in: [www.springer.com/gp/book/9783319212920](http://www.springer.com/gp/book/9783319212920)

Autonomous 3D surveillance, modelling and analysis of large areas with real-time streaming for crisis management application and integrated into C4I using swarms of autonomous aerial systems (FP7-AF3 project). More info at: <http://www.rfsat.com/index.php/en/results/technologies/uav-wildfires.html>

## SENCEPTION

Senception has been awarded with the "National Award for Digital Technology 2017/2018", EBA and is competing to become the European champion in the same category.

## SIKLU

Connect the Unconnected - A program in Cleveland, U.S., that supports 140 households by bringing them online, providing devices for each household, and providing digital literacy and job training. This program extends the fiber-optic network that connects Cleveland's hospitals using a millimeter-wave transmission system from Siklu. This initiative brings gigabyte-per-second connections to the city's public housing.

## Expertise in 5G

Senception specializes in the development of network contextualization solutions and services for wireless and cellular networks. Our software-based solutions assist communication and interaction via the analysis of aspects such as proximity, similarity, availability, or device's centrality.

Our expertise in 5G is focused on cognitive resource control and adaptation (context driven) as well as on optimized forwarding and routing.

## Expertise in vertical sectors

Senception's context-driven communication core engine PerSense (TM) is being applied in the vertical markets of Smart Cities, e-Health, Public Safety Communication.

## Expertise in R&D and Innovation

Born as a spin-off of a portuguese research lab, Senception's team has a wide experience in industrial innovation and research and development.

Senception has been awarded with the "National Award for Digital Technology 2017/2018", EBA and is competing to become the European champion in the same category.

The latest R&D project developed by Senception was H2020 UMOBILE project, where Senception lead the Quality of Service work package, and where the use of contextualization to improve delivery of messages in emergency scenarios has been developed by Senception.

## Potential interest in R&D and Innovation Cooperation

We are interested in international cooperations in the context of H2020 in ICT-related fields, for instance, networking research for 5G and beyond; IoT. We are also interested in developing industrial cooperations where our PerSense communication and interaction core engine can be further applied.

## Our unique selling point

Having been founded as a spin-off of a portuguese research lab, Senception integrates the following proposition values, essential to its market success: technological innovation; user-friendliness; ubiquity; low cost.

We are interested in exploring our products in the context of R&D and therefore work by providing open versions/light versions to our partners, or within specific consortiums.



## SEVEN SOLUTIONS

Year established	2006
Number of employees	30
Website	<a href="http://www.sevensols.com">www.sevensols.com</a>
Contact email	<a href="mailto:jlgutierrez@sevensols.com">jlgutierrez@sevensols.com</a>

### Expertise in 5G

Seven Solutions provides devices and technologies capable of distributing time and frequency over metro and long-haul 5G links in both back-haul and front-haul:

- Ultra-accurate Time and Frequency Transfer (phase transfer using IEEE 1588 High-Accuracy Profile)
- Reliable GNSS Timing and Positioning Technologies (backup system)
- High bandwidth & low latency Ethernet communications
- Deterministic data delivery based for Time-Aware Applications

In this framework, Seven Solutions develops custom electronic designs, such as PCB boards (carriers, FMCs, XMCs, ...), time and RF distribution equipment, DSPs & SoC software and FPGA gateware.

### Expertise in vertical sectors

Our expertise on Timing based on IEEE 1588 (PTP) High Accuracy profile (HA or the pre-standard White-Rabbit) covers the following vertical sectors: Financial (FinTech), Critical Infrastructures, Energy, Smart City, Automotive and Factories of Future. We have also expertise on adapting the timing for Positioning based on ground antennas.

### Expertise in R&D and Innovation

Seven Solutions has long expertise in R&D projects for more than 10 years in international funding programs (FP6, FP7, ARTEMIS, ECSEL ...) in several domains. RECOMP and EMC2, focused on safety-critical applications/services for avionics,

automotive, industry and IoT. CLONETS, focusing on next generation needs for time and frequency transfer over optical fibres for cloud computing and IoT. FitOptiVis, focusing on developing and integrating smart solutions for cyber-physical systems (architecture, high-performance and smart devices). SINCRONET, developing ultra-accurate and reliable synchronization timing devices for electrical infrastructures and 5G.

### Potential interest in R&D and Innovation Cooperation

We are interested in collaborating in ICT-related H2020 calls related to telecom, satellite services, 5G, IoT, smart cities and energy. Cooperation with international partners from different sectors to setup pilots and PoCs.

### Our unique selling point

Seven Solutions, worldwide leaders in the White Rabbit (IEEE 1588 high-accuracy profile) timing technology. It is a private held leading company in accurate sub-nanosecond time transfer and frequency distribution for reliable industrial and scientific applications. Our timing products have been validated during the last 7 years and we offer currently the best interoperable, dependable and ultra-accurate time transfer approach in the market (nanosecond accuracy, deterministic, dependable and scalable).

We are partners in 5G PPP IA and we also belong to the Xilinx Alliance Program for the development and deployment of new FPGA products.



## SIKLU

Year established	2008
Number of employees	75
Website	<a href="http://www.siklu.com">www.siklu.com</a>
Contact email	<a href="mailto:yigal@siklu.com">yigal@siklu.com</a>

### Expertise in 5G

Siklu is a provider of wireless connectivity solutions based on mmwave technology. Siklu's product include both point-to-point link solutions with data rates as high as 10Gbps for backhaul/fronthaul applications and point-to-multi-point solutions that may be used for broadband fixed access applications or small-cell backhaul applications. Siklu has building blocks such as self designed RFIC and self designed mmwave beam-steering antenna that can be used to design mmwave remote radio heads compatible with 5G standardization.

### Expertise in vertical sectors

Siklu is currently active in several market segments that require high reliability, low cost, Gigabit throughput wireless solutions. These markets include cellular backhaul (where Siklu typically provides P2P mmwave links with throughput up to 10Gbps), business connectivity (served mostly by P2P mmwave technology), fiber-to-the-home fiber extension (where Siklu provides P2MP access equipment as well as rollout design support) and smart/safe city connectivity (served mostly by P2MP mmwave technology).

### Expertise in R&D and Innovation

Although Siklu is a systems company, it has extensive design capabilities. Siklu has designed by itself most of the building blocks of its products. This includes design of antennas (both passive and active beam-steering antennas), mmwave RFIC (at 60GHz, 70GHz and 80GHz), mmwave radio boards, Gigabit throughput modem chip, layer-2 networking SW stack, wireless network planning tools based on GIS databases and also the full wireless product both in point-to-point and point-to-multipoint topologies.

### Potential interest in R&D and Innovation Cooperation

Siklu has been intensively involved in R&D and innovation cooperation projects. It has participated in FP-7 projects BunGee and IPHOBAC-NG, as well as in H2020 projects RAPID and 5G-PHOS. Siklu is also involved with other research consortia and collaborates on research with partners from both industry and academy. Siklu cooperation interests include mmwave radio and antenna technology, high-speed modem technology, mmwave beam-steering antennas, 5G RRH, mmwave/fiber integration and any other ideas that may be exploited in its target markets.

### Our unique selling point

Siklu is a small company with a very broad span of interests and capabilities, enabling it to pursue innovation and execute it quickly and efficiently to convert it from an idea to a selling product.





# SPECTRUM INSIGHT LTD

Year established	2009
Number of employees	2
Website	<a href="http://www.spectrum-insight.com">www.spectrum-insight.com</a>
Contact email	<a href="mailto:keith@spectrum-insight.com">keith@spectrum-insight.com</a>

## Expertise in 5G

Participation in 5G forums on behalf of a satellite company and providing consultancy on systems aspects.

Familiarity with 3GPP standards up to and including Release 15.

In conjunction with Tamum Consulting SARL ([www.tamum.com](http://www.tamum.com)): Attendance at 3GPP meetings and Training courses (Masters Degree level) in 5G/ IoT.

## Expertise in vertical sectors

Satellite communications including solutions which feature a terrestrial ground component.

IoT standards including NB-IoT and LTE-M for application in a wide range of industries.

Smart Home/ Connected Home including Smart metering.

Public safety related enhancements to LTE.

## Expertise in R&D and Innovation

Spectrum Insight and Tamum staff have extensive R&D experience in GSM, UMTS, and LTE technology and standards development.

Over 20 granted US patents, mainly in the field of wireless access technology.

Over 25 years of experience in spectrum aspects and standards covering the Radio Access Network and Core Network from the early days of GSM up to the present day.

## Potential interest in R&D and Innovation Cooperation

Working with partners to assist working with, or developing, 3GPP standards and product based on these standards.

Of particular interest are:

1. Solutions to enhance coverage, including non-terrestrial technologies: reduce economic barriers to providing coverage and improve reliability of coverage.
2. Smart Cities - including energy and transportation sectors (road, rail, air, etc.).

## Our unique selling point

A combination of standards and R&D experience provides partners a resource which offers both breadth and depth of expertise in wireless technology from GSM to 3GPP Release 15.

Companies registered in France (SARL) and UK (LTD).





# SUITE5 DATA INTELLIGENCE SOLUTIONS LIMITED

Year established	2017
Number of employees	12
Website	<a href="http://www.suite5.eu">www.suite5.eu</a>
Contact email	<a href="mailto:contact@suite5.eu">contact@suite5.eu</a>

## Expertise in 5G

Suite5 Data Intelligence Solutions works in the 5G domain (MATILDA project, G.A. No. 761898) in the area of execution policy models for applications that run on top of SDNs, and in the area of Analytics that are able to the behaviour of systems in 5G ecosystems. Those two combined are in a position assist decision making towards network placement, deployment and reconfiguration and could help to generate new insights about 5G applications and new policies for optimum utilisation of resources.

## Expertise in vertical sectors

Suite5 has worked in various verticals, with specific focus in Manufacturing, Energy and public safety. In all those verticals, Suite5 works with analytics solutions that are able to provide descriptive and prescriptive analytics, which are based both on structured and unstructured data and are coming out of hardware and software sensors. The company's solution "Suite5 Enterprise Analytics Engine" is the core driver in these approaches. In the manufacturing verticals, sensor data are based on machines' outputs, while in the Public Safety domain emphasis is on wearable sensors and other human generated data, and in the Energy sector on Smart Home sensors.

## Expertise in R&D and Innovation

Suite5 is active in various R&D and Innovation projects, aiming to match innovations coming out of research activities to existing company offerings, towards attaching added value to its products and services and commercializing research outputs. In more detail, Suite5 participates in such activities as a data analytics and intelligence provider, working on machine learning, big data, data management and data sharing, and insights generation, in various verticals. The company participates in such attempts in the 5G sector, as well as in other sectors such as Manufacturing, Energy, Aviation and Cybersecurity.

## Potential interest in R&D and Innovation Cooperation

Suite5 is highly interested in joint ventures which have R&D and Innovation interest in any vertical which either works with data insights, or else expect to be benefited from the application of data technologies on them, bringing data intelligence and softwarisation features to both traditional as well as cutting edge sectors.

## Our unique selling point

Offering a scalable and expandable platform, tailor-made to customer business intelligence needs.



Year established	2007
Number of employees	31
Website	<a href="http://www.synelixis.com">www.synelixis.com</a>
Contact email	<a href="mailto:info@synelixis.com">info@synelixis.com</a>

## Expertise in 5G

Synelixis is consortium member of the SONATA and 5G TANGO projects in 5G PPP Phase 1 and 2, respectively. In these projects, Synelixis is responsible for developing and integrating a monitoring framework that fulfills the requirements to accommodate 5G network services under the SDN/NFV paradigm. The implemented monitoring framework defines an open-source, non-intrusive, flexible and modular mechanism able to follow rapidly changing Network Functions and Services and produce real-time and event-driven alerts at different customizable aggregation levels/rules.

## Expertise in vertical sectors

Synelixis is seeking for opportunities to promote the company's service portfolio via the 5G ecosystem, including agriculture, smart city and media streaming:

- SynField is Synelixis' hardware/embedded software/cloud/mobile app offering for a rich flavor of agriculture and water management services, such as crop disease prediction, smart irrigation and well/water tanks monitoring and control, tailored to different crop, terrain and soil characteristics and micro-climatic conditions.
- Cache-It! is Synelixis' VNF caching solution, which contributes to the 3GPP Dynamic Adaptive HTTP Streaming (DASH) technology for the delivery of premium 5G media streaming services. Cache-It! empowers telecom operators with an innovative distributed caching system to leverage the latest advances in global business collaboration and meet growing market demands.
- SyMon is Synelixis' novel monitoring framework that satisfies the most demanding requirements related to SDN/NFV-based service deployment in public, private or hybrid cloud environments. Compliant with international standards, e.g. ETSI NFV MANO, SyMon provides real-time data collection and alert notifications based on preselected or user-defined metrics for monitoring the service performance during its whole lifecycle.

## Expertise in R&D and Innovation

Synelixis is a high-tech SME that provides complete networking, security and control and automation solutions. Synelixis technology superiority is a result of extensive R&D activities in the areas of Virtualization and Cloud Computing, HPC, IoT, blockchains and inter-ledger technologies, Machine Learning and CyberSecurity. Synelixis has participated and (technically) coordinated a significant number of multi-national projects and established long living co-operations with well renowned companies in EU and USA. Synelixis is member of NEM, NESSI, FIWARE, AIOTI and ETP4HPC technology platforms as well as the European 5G-PPP.

## Potential interest in R&D and Innovation Cooperation

We are particularly interested in creating additional innovation and integrating novel technologies to our products in the areas of Critical Infrastructure Communications (i.e. Energy, Water and eHealth), Precision Agriculture and Smart City. We are looking forward to expanding and integrating our products with 5G networks and exploring the benefits of 5G network service flexibility. We are also able to bring potential use case scenarios and end users in the areas of smart farming and critical communications, including links with hospitals/clinics and water management entities.

## Our unique selling point

With more than 120 installations of our SynField solution in 7 countries, Synelixis is an HPE Technology Ready Partner for Smart Irrigation offerings worldwide. Combining our knowhow, capacity and expertise to design and develop professional, time-critical solutions in cross-vertical scenarios (i.e. energy, water management, smart irrigation, food traceability, assisted living, health), we are able to contribute in bringing 5G SDN/VNF technology from lab to the market.



## TREELAGIC

Year established	1996
Number of employees	140
Website	<a href="http://www.treelogic.com">www.treelogic.com</a>
Contact email	<a href="mailto:info@treelogic.com">info@treelogic.com</a>

### Expertise in 5G

Treelogic helps optimizing processes and business operations in several sectors using advanced ICT solutions focused on Artificial Intelligence & Big Data, integrating emerging technologies as part of the Smart Data ecosystem. In particular in 5G, TREELAGIC is active in accompanying industrial partners such as telecommunication operators in their digital transformation, contributing with our knowledge in advanced AI and Big Data technologies. Framework In addition to that, Artificial Intelligence-based solutions for cybersecurity in the 5G telco infrastructure are also offered by the company.

### Expertise in vertical sectors

TREELAGIC operates in several vertical sectors, such as Telecommunications, Health, Transport, Finance, Insurance, Industry, Public Safety, Security, or Astrophysics, to name a few. We accompany industrial partners such as telecommunication operators, financial entities and insurance companies in their digital transformation, contributing with our knowledge in advanced technologies such as Big Data, Data Science and Computer Vision; we collaborate with experts from various clinical areas in healthcare research to apply the latest technologies (more than 175 hospitals and health centres work with our solutions); we develop smart transport systems, staff and vehicle tracking and technologies related to mobility and security.

### Expertise in R&D and Innovation

TREELAGIC actively participate in the definition and development of international R&D projects. Involved in more than 20 European projects, we perform strongly in terms of participation and leadership in the European R&D programme Horizon 2020. Our R&D activity provides us with knowledge and differential capabilities, based on advanced technologies with great future potential and aligned with world priorities in matters of innovation, allowing us to develop competitive advantages.

### Potential interest in R&D and Innovation Cooperation

TREELAGIC is very active in cooperative R&D initiatives, both publicly and privately funded. In example, we are very active in EU-funded R&D projects, especially under Horizon 2020 programme in different areas. We are open and interested to collaboration in R&D wherever our expertise can add value. Our core activity is in the area of Artificial Intelligence and Big Data, so we are interested to collaborate with partners and initiatives demanding these competencies.

### Our unique selling point

Treelogic helps optimizing processes and business operations in several sectors using advanced ICT solutions focused on Artificial Intelligence & Big Data, integrating emerging technologies as part of the Smart Data ecosystem.



## TST-SISTEMAS

Year established	2007
Number of employees	20
Website	<a href="http://www.tst-sistemas.es">www.tst-sistemas.es</a>
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### Expertise in 5G

TST participated in the Flex5Gware project (<http://www.flex5gware.eu/>), focused on flexible and efficient HW and SW platforms for 5G network elements and devices, addressing increased capacity, reduced energy footprint, as well as scalability, modularity and reconfigurability. Research was demonstrated on proof-of-concept implementations. TST participated on a PoC for testing the reconfiguration of the radio behaviour according to different optimization criteria, allowing for instance multi-cell dynamic resource allocations and switching across different radio access technologies according to the link quality.

### Expertise in vertical sectors

TST provides IoT custom solutions on the smart cities, manufacturing/industry and precision farming domains. Among the projects carried out in this Smart City context, it's worth highlighting environmental sensing, and ultrasonic sensors for urban waste management. Related to industry domain, TST offer smart solutions to automate operational processes. And we can mention our IoT crop sensing solution combined with weather station to control the water supply, related to precision farming domain.

### Expertise in R&D and Innovation

TST has a broad experience in both national and international R&D projects, it has been involved in 14 EU-funded research projects related to IoT, smart services and future networks (4 ICT-FP7, 2 ICT-CIP, 3 ICT-H2020, 3 ECSEL, 2 CELTIC). Its research activity has been recognized by the Spanish Ministry of Economy and Competitiveness, which awarded TST the official "Innovative SME" seal.

Among the main skills and technical background of TST appears the use of advanced technologies to support the IoT concept: low-power hardware design, security features, cloud integration, and wireless communication technologies.

### Potential interest in R&D and Innovation Cooperation

TST looks forward to continue working with other potential partners in R&D and innovation activities, offering its experience in IoT hardware design and development, smart sensing and system integration.

### Our unique selling point

TST is an experienced IoT solutions provider, counting on production, testing and validation facilities (including anechoic chamber for antenna design), and able to optimize manufacturing processes to offer very competitive prices. TST products are always based on cutting-edge technologies supported by the strong involvement on innovation activities.



## UBITECH

Year established	2005
Number of employees	25
Website	<a href="http://www.ubitech.eu">www.ubitech.eu</a>
Contact email	<a href="mailto:azafeiropoulos@ubitech.eu">azafeiropoulos@ubitech.eu</a>

### Expertise in 5G

UBITECH is active in a series of 5G PPP projects, focusing mainly on the design and development of software development kits and intelligent orchestration mechanisms for network applications and services. UBITECH is the technical coordinator of the MATILDA H2020 5G PPP project targeting at the provision of a novel holistic framework for enabling vertical industries to take advantage of a 5G ecosystem. Application and network services orchestration mechanisms, taking into account the separation of concerns among vertical application orchestrators and NFV orchestrators, as well as end to end slice instantiation and management mechanisms are considered.

### Expertise in vertical sectors

UBITECH has acquired expertise towards the design and development of cloud-native applications and network functions that can be applicable to various industry verticals. Focus is given on security, voice communications and energy aspects.

### Expertise in R&D and Innovation

UBITECH has intense R&D activities with regards to the design of intelligent orchestration mechanisms (e.g. rules-based policy management framework for NFVOs as well as vertical application orchestrators, optimisation engine for optimal placement of network applications and services, big data analytics techniques for network management and security), the design and implementation of OSS northbound APIs towards vertical application orchestrators as

well as the design and development of software development and verification toolkits for 5G-ready applications. Innovation potential mainly stems from the interconnection of vertical application orchestrators with telecom operators' network management systems.

### Potential interest in R&D and Innovation Cooperation

UBITECH is highly interested in establishing R&D and Innovation cooperations in the framework of research and development projects regarding the evolution of intelligent orchestration and slice management mechanisms, as well as collaborations with telecom operators and vendors towards the design of OSS-oriented functions and APIs, as well as the development of virtual network functions and network services.

### Our unique selling point

Inject intelligence in network services and applications orchestration, while in parallel supporting separation of concerns among application/services and telecom infrastructure providers.



## UBIWHERE

Year established	2007
Number of employees	50
Website	<a href="http://www.ubiwhere.com">www.ubiwhere.com</a>
Contact email	<a href="mailto:info@ubiwhere.com">info@ubiwhere.com</a>

### Expertise in 5G

Since its foundation in 2007, Ubiwhere has been focusing its research and commercial activities in the telecommunications sector. To ensure the roll-out of 5G in the coming years, Ubiwhere has been actively participating in H2020 projects, developing new products included in its commercial portfolio while strongly involved in standardization bodies and EU initiatives. With an expertise ranging from the LTE core to MANO of 5G networks along with security and monitoring implications, Ubiwhere can provide valid inputs in all stages of a large 5G project, from the initial design to the exploitation of the results and potential standardization.

### Expertise in vertical sectors

Ubiwhere is a reference in the Smart Cities sector, having already deployed different vertical solutions (smart parking, traffic, waste management and air quality monitoring) in America, Europe and South Africa, through its Citibrain brand. Ubiwhere is also bringing to the market neutral hosting technology allowing some of the envisioned 5G use cases to surface. In this context, with Unicle, Ubiwhere is developing CCAM (Cooperative, Connected and Automated Mobility) services, by working closely with Automotive Industry and Mobile Network Operators to better align this development, accelerating 5G adoption in the V2X domain and, thus, fostering new valuable business opportunities.

### Expertise in R&D and Innovation

So far, Ubiwhere has participated in different H2020 projects such as EMBERS, symbloTe, SmartSDK, SynchroniCity, SHIELD and QPARK, including also the 5G PPP's SONATA, SELFNET and 5GCity. Furthermore, Ubiwhere has also participated in many H2020 projects Open Calls, using their research activities to develop innovative commercial solutions. Ubiwhere is a Full Member of ETS and recently trusted to develop the SDO's MEC (Multi-access Edge Computing) Testing Framework.

### Potential interest in R&D and Innovation Cooperation

Ubiwhere is always actively searching for both R&I partnerships and commercial joint ventures. The company's team includes different Telecommunications Engineers profiles and Software Developers expertises, which is a valuable asset for the rapidly growing 5G ecosystem. Ubiwhere believes highly innovative and commercially competitive solutions can be developed in conjunction with other like-minded partners from industry.

### Our unique selling point

Ubiwhere positions itself as both 5G enabler (by developing solutions supporting the 5G ecosystem) and 5G vertical service provider (by providing services benefitting from the 5G KPIs and infrastructure).



## VERTICAL M2M

Year established	2008
Number of employees	10
Website	<a href="http://www.vertical-m2m.com">www.vertical-m2m.com</a>
Contact email	<a href="mailto:network@vertical-m2m.com">network@vertical-m2m.com</a>

### Expertise in 5G

Vertical M2M has a strong expertise in telecom software and PaaS architectures, and advanced skills in telecommunications, supporting many different telecom protocols through an agnostic approach.

With a 10+ year - experience in IoT, we also bring a complete framework and sets of tools for secured IoT applications over 5G networks.

### Expertise in vertical sectors

Vertical M2M has so far deployed many IoT projects, with a particular focus on the following markets through mostly white-label solutions:

- energy: smarthome, renewable energy monitoring solutions for Utilities and ESCO (Energy Service Companies) & building energy monitoring
- smartcities: smartmetering solutions, streetlighting services, building management,...
- manufacturing/industry: predictive maintenance solutions, process monitoring and smartfactory, putting together combinations of heterogeneous secured IoT systems

### Expertise in R&D and Innovation

As a telecom software vendor dedicated to IoT, we invest a wide part of our resources in R&D and we have been involved in several collaborative R&D projects supported either by the French ministry of research (FUI projects) or the French public investment bank (BPI) or the European Commission (H2020 5G-PPP projects).

### Potential interest in R&D and Innovation Cooperation

We are particularly interested in any collaborative research related to IoT over 5G networks (massive IoT, mission critical IoT, vertical IoT or Edge Cloud IoT) and bring contributions either at the IaaS or the PaaS levels.

We also have a strong interest in 5G applications for the energy, smartcity or industry/smartfactory areas and are eager to be part of PoCs or large-scale experiments applied to these markets.

### Our unique selling point

With CommonSense IoT Platform, we dramatically ease secured deployment of IoT solutions from the IoT node up to the IoT application with a standardized and open platform that can immediately connect and manage 5G and non-5G IoT devices and help design complete applications as well.





# VISIONA INGENIERÍA DE PROYECTOS S.L.

Year established	2006
Number of employees	8
Website	<a href="http://www.visiona-ip.es">www.visiona-ip.es</a>
Contact email	<a href="mailto:nsanchez@visiona-ip.es">nsanchez@visiona-ip.es</a>

## Expertise in 5G

VISIONA is a cutting-edge Information Technology SME that has actively participated in several open calls from the research and innovation EU programmes, like the H2020 5G-PPP Phase-1 5G-Crosshaul and Phase-2 NRG5 projects. VISIONA team counts on with expertise in designing big systems and managing projects of big magnitude, in designing network elements and network services for NFV and SDN, planning and operation of networks based on these technologies. Strong background in virtualization of functions that lead to 5G-ready innovative and smart environments.

## Expertise in vertical sectors

VISIONA is specialized in groundbreaking media technologies, from production and postproduction systems, coding, transmission, etc. to those designed for the final user, including broadcast solutions, video processing, media analytics, coding, mobile live streaming and hyper-personalization. This makes of VISIONA a suitable partner for any vertical demanding such expertise (from entertainment to smart cities and energy related contexts, among other).

## Expertise in R&D and Innovation

VISIONA core team is composed of PhD senior researchers and Professors in the field of Technology and Communications Systems with outstanding experience on system design and application development in collaboration with national and international companies in several R&D public and private funding meaningful projects. Furthermore, VISIONA was awarded with the Innovative SME Certification by Spanish Ministry of Economy, Industry and Competitiveness in September 2016.

## Potential interest in R&D and Innovation Cooperation

VISIONA is seeking EU partners interested in collaborating with our SME to identify synergies so that we could work together on the creation of innovative solutions and the design strategies for exploitation of cooperation results in order to achieve maximum impact of 5G-related technologies after experimentation.

## Our unique selling point

Spanish SME spin-off of the research group in Technical University of Madrid that has been leading progresses on multimedia for more than 15 years.







## WEST AQUILA

Year established	2004
Number of employees	15
Website	<a href="http://www.westaquila.com">www.westaquila.com</a>
Contact email	<a href="mailto:info@westaquila.com">info@westaquila.com</a>

### Expertise in 5G

The company has already gained a decade-long experience by participating as a key technological partner in several national and European projects, with particular emphasis on integration of heterogeneous wireless interfaces and IoT. Furthermore, the company is located in one of the five Italian cities selected by the Italian Ministry of Economic Development for pre-commercial 5G trials. It is now surrounded by a 5G eco-system composed of network operators, chip makers, telecom manufacturers and vertical sector integrators that refer to healthcare, mobility, energy, safety and emergency management.

### Expertise in vertical sectors

In the recent past, WEST has participated in several EU projects, including an ITN Marie Curie project (Greenet) focused on the analysis, design, and optimisation of energy efficient wireless communication systems and networks, and two IAPP Marie Curie projects, WSN4QoL (a healthcare-oriented project proposing Wireless Sensor Networks for Quality of Life) and SmartNRG (dealing with new solutions for energy distribution and management for smart cities).

WEST has also participated to a national project on Structural Health Monitoring, where a WSN is used to monitor historical buildings after the earthquake of 2009 in L'Aquila, and UbiCare and CASA+, two projects aimed at remote monitoring aged people and patients who have Down syndrome.

### Expertise in R&D and Innovation

The background of the company relies upon system design methodologies, wireless networked embedded systems and heterogeneous distributed networks. The co-founders have brought into the company the experience gained within several European-funded projects and through long-lasting R&D collaborations with many companies. The main expertise of WEST lies in the development of innovative solutions and technologies for networked embedded systems and massive IoT, which encompass the development of large-scale system level simulators and network testbeds.

### Potential interest in R&D and Innovation Cooperation

WEST is a highly dynamic and innovative company, which aims at bridging the gap between the academic and industry sectors. In this perspective, the company envisions the possibility to exploit cutting-edge technologies in multiple application domains. As an R&D company, there is always a strong interest in fostering new cooperation s devoted to study, analyse and prototype solutions in the field of networked embedded systems and cyber-physical systems.

### Our unique selling point

WEST main ability lies in the design, development and prototyping of novel solutions, also for proofs-of-concept. In all the projects developed so far, WEST has exploited his consistent R&D background in successfully developing and testing several HW/SW platforms for wireless embedded systems, along with on-field optimisation of several algorithms and configurations. WEST is inherently open to new opportunities for collaborations with interested partners, from both academia and industry sectors.



# WINGS ICT SOLUTIONS

Year established	2012
Number of employees	70
Website	<a href="http://www.wings-ict-solutions.eu">www.wings-ict-solutions.eu</a>
Contact email	<a href="mailto:info@wings-ict-solutions.eu">info@wings-ict-solutions.eu</a> <a href="mailto:ktsagk@wings-ict-solutions.eu">ktsagk@wings-ict-solutions.eu</a> <a href="mailto:kritikou@wings-ict-solutions.eu">kritikou@wings-ict-solutions.eu</a>

## Expertise in 5G

WINGS’ portfolio of expertise includes (but is not limited to) the following 5G related domains: Smart Wireless Access (5G, 4G, wireless network management), Internet of Things (IoT), Software Defined Networks (SDN)/ Network Function Virtualization (NFV), Artificial Intelligence (AI) & Big Data Analytics (enhanced algorithms for new applications), Security/Cybersecurity.

## Expertise in vertical sectors

WINGS’ expertise in vertical sectors includes: water, energy, smart cities, food safety, health, transportation, finance. More specifically, WINGS develops, in the context of the WINGS “Artificial intelligence & Internet of Things powered platform/solution for verticals”, the solutions for (i) water management (Cataract - proactive management platform for smart connected water), which is already being piloted in Northern Greece, (ii) assisted living - smart cities, smart home and health (Starlit - cloud based iot smart living platform), (iii) health (Migrainenet), (iv) energy (solution EnergyWater) and (v) fintech (platform Incelligent - as a spin-out company).

## Expertise in R&D and Innovation

WINGS members have more than 20 years’ experience in Research and Innovation activities and projects. WINGS’ portfolio of expertise in R&D and Innovation includes projects in 5G (currently H2020/One5G, H2020-EU-Taiwan/Clear5G, H2020/Speed5G, as well as completed projects H2020/Flex5Gware, H2020/Fantastic5G etc). Moreover, the company is involved in R&D projects in Verticals such as food safety & security (H2020/Impaq and H2020/PhasmaFOOD), transportation (H2020/MyCorridor and nationally funded project netPARK), as well as projects in Big Data and Artificial Intelligence (i.e. projects H2020/PROTEUS, H2020 EU-Japan/iKaaS etc).

## Potential interest in R&D and Innovation Cooperation

WINGS is interested in international cooperation in the areas of 5G and Verticals (water, energy, smart cities, food safety, health, transportation, finance). WINGS is also open to new proposals for collaboration in new areas in the verticals sector. Such cooperations will be supported by the company members’ long expertise in international Research and Development projects.

## Our unique selling point

Our combination of domain knowledge in various verticals (water, assisted living, health, food safety, transportation, energy, fintech), with technology areas (5G, IoT, SDN/NFV, AI & Big Data, Security/Cybersecurity)



# SUCCESS STORIES

## UBITECH

UBITECH's expertise and ongoing activities towards the design and development of intelligent orchestration mechanisms has led to the implementation and continuous evolution of the MAESTRO Orchestrator. MAESTRO is mainly focusing on interconnecting vertical applications orchestration with network services orchestration based on the instantiation and management of application-aware network slices.

## UBIWHERE

Ubiwhere is a key partner of a Portuguese Joint Venture called Smartlamppost, whose acquired knowledge and 5G expertise is allowing infrastructure owners to benefit from the neutral host approach to monetize on their investment while providing MNOs a scalable and cost-effective-effective 5G network deployments.

## WINGS ICT SOLUTIONS

Our current best success story is the Cataract platform, an innovative water management platform for addressing in a holistic way key water-related cases. Currently, Cataract is piloted in Northern Greece in a Smart University campus, in collaboration with the big Greek mobile operator COSMOTE, member of Deutsche Telekom Group, providing NB-IoT based Smart Connected Water Solution for Water Quality Management, as well as in the Athens area.

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More information at  
[www.networld2020.eu/sme-support](http://www.networld2020.eu/sme-support)



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