



INGENIOUS

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The First Responder (FR) of the Future: a Next Generation Integrated Toolkit (NGIT) for Collaborative Response, increasing protection and augmenting operational capacity



This project has been selected to receive funding from the
European Union's Horizon 2020 research and innovation
programme under grant agreement No 832876

INGENIOUS

- **Call:** H2020-SU-SEC-2018-2019-2020
- **Type of Action:** RIA
- **Acronym:** Ingenious

The First Responder (FR) of the Future: a Next Generation Integrated Toolkit (NGIT) for Collaborative Response, increasing protection and augmenting operational capacity

- **Duration:** 36 months
- **Start Date:** 01 Sep 2019
- **Estimated Project Cost:** € 8,961,111.25

Challenge

- **Increase EU resilience** by allowing authorities to take proper measures in response to severe disasters
- **Innovate in response tasks and missions** drawing from novel technologies
- Detecting, monitoring and analyzing passive and active **threats and hazards** at incident scenes in real time
- Knowing the **location** of first responders and their **proximity** to team members, victims, assets, risks and hazards in **real-time**
- **Augmenting common operational picture and sense-making** by incorporating information from multiple and non-traditional sources

Objectives

- The main objectives of Ingenious are:
- OBJ-1: To increase EU resilience against natural and man-made attacks by augmenting response capabilities in all types of disasters
- OBJ-2: To ensure the well-being of response teams, at the EU-level (and beyond), and increase their operational capacity
- OBJ-3: To deliver a Next Generation Integrated Toolkit (NGIT) for Collaborative Response extensively validated by EU and International (tests realized in Korea) practitioners and technology providers
- OBJ-4: To develop a set of wearable technologies & miniaturized sensors which protect and empower first responders, and their K9 companions
- OBJ-5: To develop a set of ancillary devices and platforms, rapidly and autonomously deployed in the field
- OBJ-6: To fuse all available information under an integrated framework, and develop an advanced C₃ (Command, Control & Coordination) providing the Common Operating Picture (COP) to all types of response units, advancing coordination and cross-team collaboration

Objectives

- OBJ-7: To convey the COP to the FR, by exploiting recent advances in Augmented Reality, and developing a set of mobile Apps that allow the FR units to better coordinate tactical and operational response
- OBJ-8: To increase public safety by greatly improving the capabilities of EU response units
- OBJ-9: To allow cross-domain and cross-country response team collaboration (incl. Korea and US), overcoming language and policy barriers through technology
- OBJ-10: Ensure legal, societal, ethical, security considerations advancing INGENIOUS sustainability are considered
- OBJ-11: Engage all relevant technology stakeholders and practitioners in the Action maximizing market penetration and exploitation of the Toolkit hence facilitating adoption by the FR community

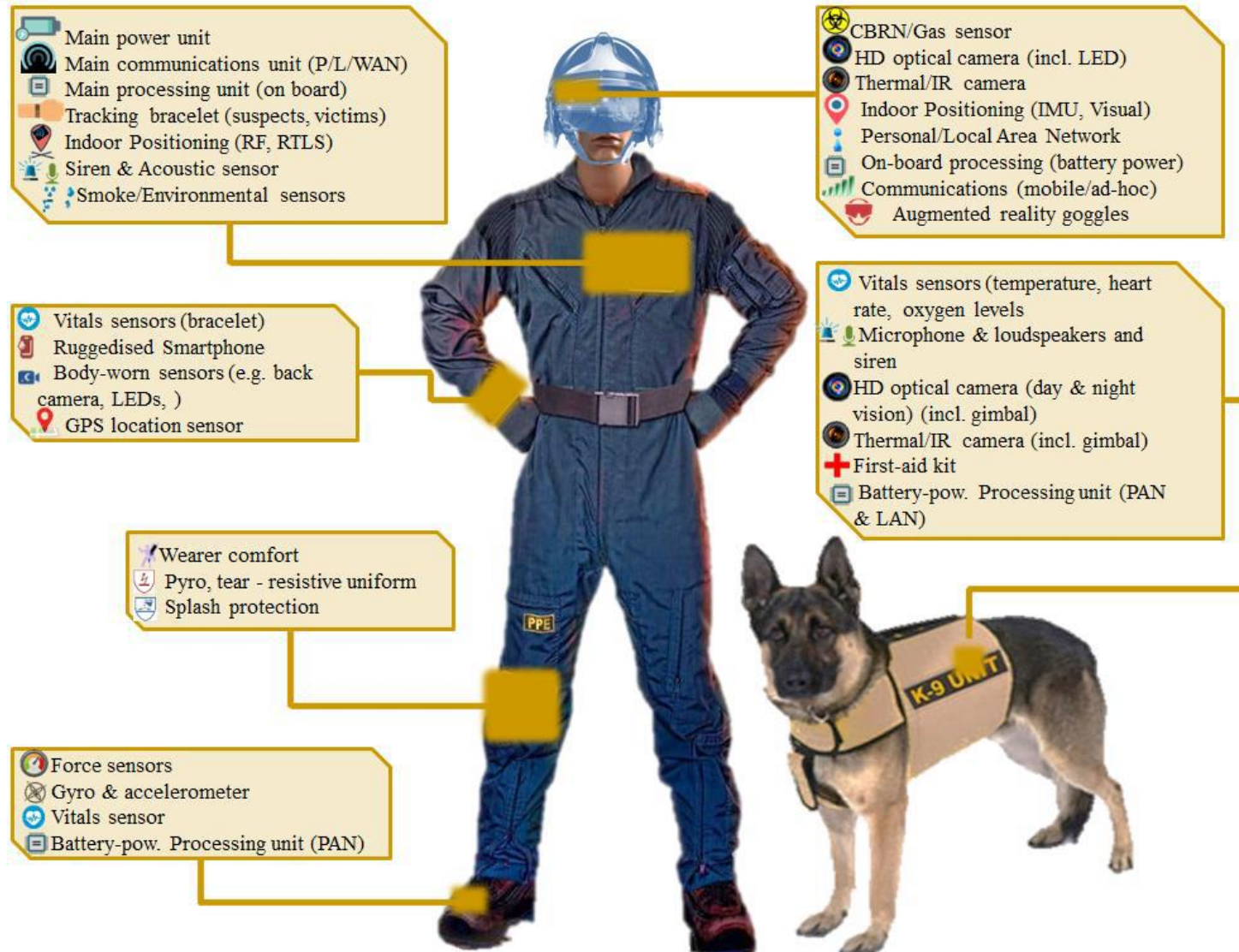
Concept

- From an operational perspective, NGIT supports and improves the following response activities:
 - 1) Improving situational awareness
 - 2) Delivering resilient data and voice communications
 - 3) Augmenting command, control and coordination
 - 4) Preserving responders' health and safety and boosting performance
 - 5) Enhancing logistics and resource management
 - 6) Improving casualty management
 - 7) Upgrading Training and Exercises of the first responders' community

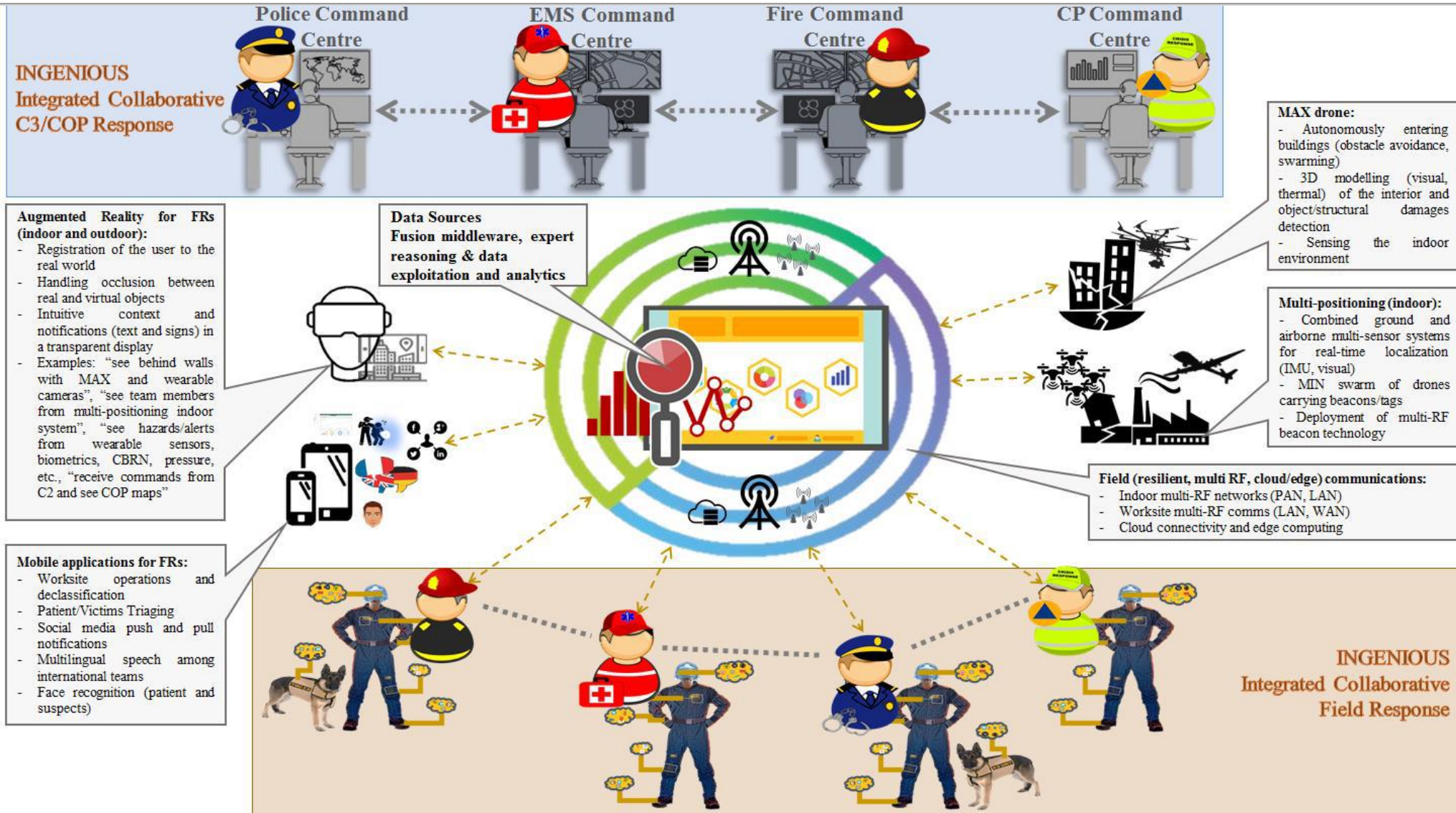
Concept

- Technology: NGIT armors the first responders with novel, affordable and reliable tools and services as part of their uniform and as part of their operational assets in an integrated manner, facilitating seamless and resilient interconnectivity and boosting awareness. More specifically:
 - 1) the NGIT builds upon the concept of “smart” first responders by holistically equipping them to protect them and assist in conducting their response duties, empowering and enhancing their helmet, uniform, boots and accompanying K9 units
 - 2) Moreover, the NGIT comprises of smart devices in the air and on the ground
 - 3) Ultimately, the NGIT supports first responders with multi-fusion and expert reasoning modules for improving situational awareness and threat and hazard detection, a C3 and a COP platform with augmented reality capabilities

Concept



Concept



INGENIOUS Integration, Testing and Validation Activities

- The steps towards INGENIOUS Toolkit delivery are described as follows:
 - Laboratory Integration and Testing :24
 - Field Integration and Small scale/Component Testing : 24
 - INGENIOUS Toolkit Field Integration and Validation : 2
- Pilots:
 - **France:** Large earthquake near shore with cascading effects, e.g. chemical leakage, comms failure
 - **Spain:** Terrorist attacks in multiple locations



WPs – research and innovation

1. Project Management and Coordination
2. User Requirements
3. Tools and services to protect First Responders
4. Smart devices in the air and on the ground
5. Information management
6. System Integration
7. Pilot implementation, evaluation and training
8. Policies, Information Management & Standardization
9. Impact Creation, Dissemination and Exploitation

Expected results

- Final system dealing with 2 big pilots
- Modules
- Operational approaches and guidelines
- Standardization

Exploitation and Dissemination

- Exploitation of results
 - Creation of modules/tools
 - Modules to be exploited by the industrial partners
- Business plan to exploit the final system
- Dissemination of results
 - user and open door days
 - conference and joint workshops
 - demonstration of results in End users
 - publication to scientific conferences and journals

Impact

- **Innovation in:**

- miniaturized, power efficient wearables and hyper-connected FRs;
- accurate localization of FRs, assets and hazards indoors and outdoors;
- autonomous with onboard processing capabilities UAVs;
- novel augmented reality services and suite of mobile apps;
- novel C3 delivering truly collaborative response and shared sense making capabilities;
- rich testing and validation program;

As a result of this action, first responders should benefit from new knowledge about field-validation of different tools, technologies and approaches involving first responders in (real-life) scenarios.

INGENIOUS augments the capabilities of FRs practitioners

New Market Opportunities

Strengthen competitiveness and growth of companies

INGENIOUS acceptance with respect to Legal, ethical and Societal aspects

Consortium

INSTITUTE OF COMMUNICATION AND COMPUTER SYSTEMS (ICCS)	Greece
UNIVERSITEIT TWENTE (ITC)	Netherlands
DEUTSCHES ZENTRUM FUER LUFT - UND RAUMFAHRT EV (DLR)	Germany
DIGINEXT (DXT)	France
FUNDACION TEKNIKER (TEK)	Spain
EXUS SOFTWARE MONOPROSOPI ETAIRIA PERIORISMENIS EVTHINIS (EXUS)	Greece
SINTEF AS	Norway
ETHNIKO KENTRO EREVNAS KAI TECHNOLOGIKIS ANAPTYXIS (CERTH)	Greece
TOTALFORSVARETS FORSKNINGSINSTITUT (FOI)	Sweden
SATWAYS - PROIONTA KAI YPIRESIES TILEMATIKIS DIKTYAKON KAI TILEPIKINONIAKON EFARMOGON ETAIRIA PERIORISMENIS EFTHINIS EPE (STWS)	Greece
ALPES LASERS SA (ALPES)	Switzerland
TECHNISCHE UNIVERSITAET WIEN (TUW)	Austria
CY.R.I.C CYPRUS RESEARCH AND INNOVATION CENTER LTD (CYRIC)	Cyprus
UNIVERSIDAD POMPEU FABRA (UPF)	Spain
SINGULARLOGIC ANONYMI ETAIREIA PLIROFORIAKON SYSTIMATON KAI EFARMOGON PLIROFORIKIS (SLG)	Greece
KOREA INSTITUTE OF ROBOT AND CONVERGENCE (KIRO)	Korea (Republic of)
GOBIERNO VASCO – DEPARTAMENTO SEGURIDAD (ERTZ)	Spain
ASSISTANCE PUBLIQUE - HOPITAUX DE PARIS (APHP-SAMU)	France
SODERTORNS BRANFORSVARSFORBUND (SBFF)	Sweden
I.S.A.R. GERMANY STIFTUNG GGMBH (ISAR)	Germany
Police Service of Northern Ireland (PSNI)	United Kingdom
ELLINIKI OMADA DIASOSIS ATTIKIS (HRTA)	Greece

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- Thank you!
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