Deployable SAR Integrated Chain with Unmanned Systems (DARIUS)

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Overview

• Interoperability for unmanned vehicles in search and rescue (SAR) applications

• DARIUS = Deployable SAR Integrated Chain with Unmanned Systems

• EU FP7 Security Project

• Total value: Euro 10.7 M
• EU contribution: Euro 7.5 M

• Duration: March 2012 to February 2015
## Partners

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Concept

- DARIUS considers various SAR scenarios where the operations require the intervention of multiple agencies in a multi-national context

- Build a DARIUS system comprising:
  - C4I Segment
  - Communications Segment
  - Ground Control Stations
  - Platforms (unmanned vehicles)
  - Sensors
  - Other payloads

- Scenario trials
  - Maritime SAR
  - Forest fire with explosion hazards
  - Urban/indoor earthquake and Seveso-like chemical accident
Objectives

• Develop interoperability solutions for the unmanned systems
• Seamlessly integrate the unmanned platforms in the command and control loop (i.e. C2/C4I platforms)
• Provide and demonstrate the necessary communication structure without relying on existing infrastructure
• Support the interaction between humans and systems, i.e. first responders, victims, unmanned vehicles and payloads
• Develop a Generic Ground Station
• Define the capability, deployability and sustainability requirements for future SAR unmanned vehicles
• Define and demonstrate operational performance improvements of current deployed solutions
• Reduce the cost of unmanned SAR solutions
Definition of interoperability

- Simultaneous command and control of several unmanned platforms.
- Sharing of unmanned platforms between several user entities participating in the same operation.
- Access to the information collected by the unmanned systems by all the interested actors, including actors from different countries.
- Sharing, fusion and correlation of the information through networking the unmanned systems in the same system of systems.
- Integration of the unmanned systems in the overall surveillance/information chain.
- Easy integration of the unmanned systems in various legacy C4I/Information chains.
Deployable Solution

- Generic Ground Station (GGS) for Tactical Command Post
- Can be easily transported, hand-carried and operated by one person
- Communication with upward C2 chain
- Standardised interfacing with UxV individual Ground Control Stations
- Compatible with WiMAX, Wi-Fi, Ethernet
- Wide range of compatible unmanned vehicles available through DARIUS consortium
- Others can easily be added
- Validated through 3 realistic field trials
Maritime Trial (December 2013)
Urban Indoor Trial (May 2014)
Forest Fire Trial (October 2014)
DARIUS Protocol Specification

• Defines the method of data transfer between the GGS and UV Ground Control Stations (GCSs).
• Enables ‘Plug And Play’ approach to UV integration.
• Published standard based on existing Open Standard OGC XML structures.
• Network type agnostic. Demonstrated on WiMAX, Wi-Fi and wired Ethernet networks.

• Public document available on DARIUS Web site: www.darius-fp7.eu
Project Current Status

- DARIUS solution exists at Technology Readiness Level (TRL) 6+ (demonstrated in a relevant environment)
- Development and trials complete
- Writing up the remaining deliverables
- Exploitation planning in progress
- Final User Workshop early in 2015
- Project will end 28 February 2015
Discussion

We welcome feedback from experienced users and other experts. In particular:

- What are we doing well?
- What are we doing badly?
- How can we work together to deploy the DARIUS solution?

What are the synergies with other projects?

How can we exploit such synergies for mutual benefit?
Thank you

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