



umbilical design



Drones in the INTERACT network

INTERACT TA User Community Webinar on Drones
January 30, 2018

WP 8





Umbilical Design

- National Space Broker, Sweden, for the European Space Agency, ESA
- Collaboration with ESA and NASA
- Technology Transfer from space down to earth and for extreme environments
- Strong focus on sustainable development
- Founded in 2001

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ESA Technology **Transfer Network**

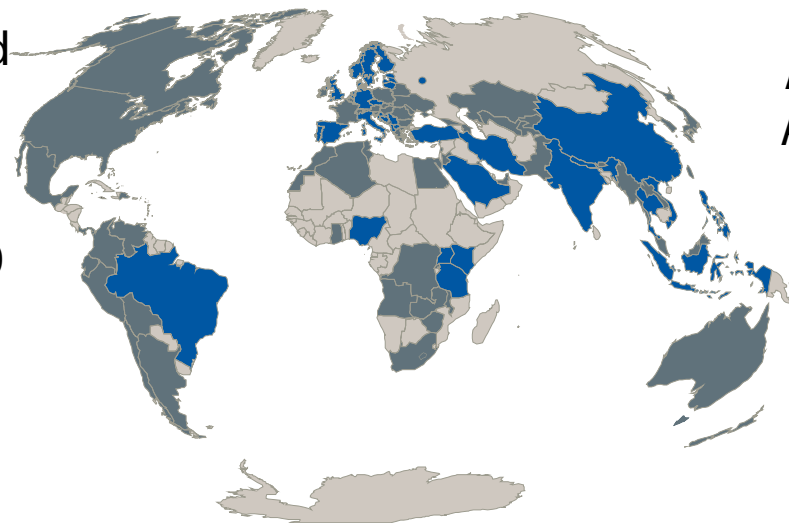
Umbilical Design is 1 of 16
Space Technology Brokers
in Europe, contracted by ESA





ÅF

- Largest engineering and consulting company in Sweden
- 10 000 employees. 27 000 within partner network
- Assignments in over 100 countries, offices in 30 countries
- Energy, Infrastructure, Industry, IT, Technology and Product development
- Founded in 1895



ÅF offices ■
ÅF projects ■

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INTERACT



International Network for Terrestrial Research
and Monitoring in the Arctic

- EU HORIZON 2020 Programme
- Build capacity for identifying, understanding, predicting and responding to diverse environmental changes
- Specifically in the wide environmental and land-use envelopes of the Arctic.
- Currently 83 field research stations in the Northern hemisphere



Objectives workpackage 8

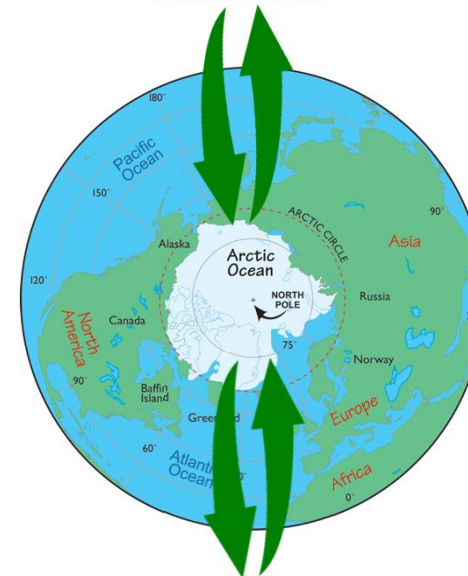
- Increasing awareness of drone technology (UD)
- Drone technologies to be used in arctic terrestrial settings (ÅF)
- Producing best practices and standards for use of drones at INTERACT research stations (ÅF)
- Transfer new technology from industry to research projects



Drones in Arctic Environments

Tasks – quick overview

- Evaluate requirements for scientists at Arctic research facilities
- Increased knowledge on drone technology and sensors used
- New applications through cooperation between arctic researchers and technology industry (drones, sensors)
- Technology transfer from industry to scientists
- Identify sensors for UAV's specifically for Arctic research currently underrepresented
- General rules and legislation with an application on the Arctic environment and their respectively countries
- Produce a best practice scheme for use of drones with sensors at Arctic research stations





Drones in Arctic Environments

Typical applications

- Automated samples: water, snow, soil, air, etc.
- Sensors mounted or located in terrestrial areas, read by a sonar on a drone
- Photogrammetry: 3D models, orthophotos, point clouds, volume measurement
- Snow depths and layers
- Pick up and deliveries
- Search and rescue





Drones in Arctic Environments

Challenges

- Climate, harsh weather
- Cold climate – humans, machines, batteries
- Icing, sunny – contrasts
- Human factor, "you should do what you're best at"
- Compass malfunction/disorientation north of 85°N
- Different countries – different legislation
- Delicate and sensitive environment





Drones in Arctic Environments

Work accomplished and in progress WP8

- Collected information from several different companies providing different drone technology and sensors to be carried by drones
- Collected information from several scientists at various INTERACT stations and their typical applications where drones could be used
- Total six master thesis students will include their reporting.
- Field study in Tarfala Research Station. Established relation with University of Stockholm.
- Delivery of legislation report
- Drone workshop Svalbard
- Informal cooperation with largest test area in Europe for drones
- 2 internal and 2 external drone seminars, gathered stakeholders and related drone technology organizations. A great opportunity to spread the vision of INTERACT.





Drones in Arctic Environments

Outside WP8

- Successful media and social media response
 - Arctic and drones – climate change and technology
 - Several articles in national and international magazines and newsletters
 - Many requests on how to contribute
 - ÅF corporate division has performed promotion within an academic and career networks
- ÅF Green Advisor Report
 - Distributed on a corporate level to leaders, stakeholders and decision-makers
- Extensive collaboration with KTH Royal Institute of Technology
 - Construction of a water sampler for drones
 - Measurement of snow
 - Financed outside WP8
- Commercial Drone Operator program
 - One of the first in Europe
 - Swedish National Agency for Higher Vocational Education, University of Lund, ÅF
 - One year education, 35 students
 - Unique opportunity for you to use their knowledge during their work placement [Learning in a work environment]





Drones in Arctic Environments

Deliverables

- **D8.1: SMF Drone Workshop Report (Month 12)**
- **D8.2: Report on drone legislation (Month 12)**
- D8.3: Report requirement specifications for drones in arctic environments, including drone types, drone projects and sensor technology (Month 18)
- D8.4: Report on recommendations for new sensor development (Month 18)
- D8.5: Guidelines for drone usage in arctic environment (Month 18)
- D8.6: TA Drone Workshop Report (Month 19)





How can Drones help you to facilitate your research?

- Can drones support your research?
- What kind of technology would you like to see in the future?
- Are you already an experienced user of drones within the scope of your research?



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