



Port of Hamburg. Critical buildings/ infrastructures protection

SCOPE

Port areas are characterized by a large number of infrastructures which makes those unintentional interferences can occur more than desired. Nevertheless, maritime community is increasingly be concerned about intentional attacks such as jamming and spoofing. The former may not critically affect to maritime safety since GNSS signal disruption would lead to service not being available. However, spoofing could potentially provoke accidents, vessel misrouting or theft. For this reason, the campaign performed in Hamburg will be devoted to operate a fleet of drones for surveillance purposes being integrated as interface to a GNSS interference detector in the port to detect interference events that could compromise the security and the safety of port operations

PLANNING

- Campaign execution: 2023 Q3 (July 2023)

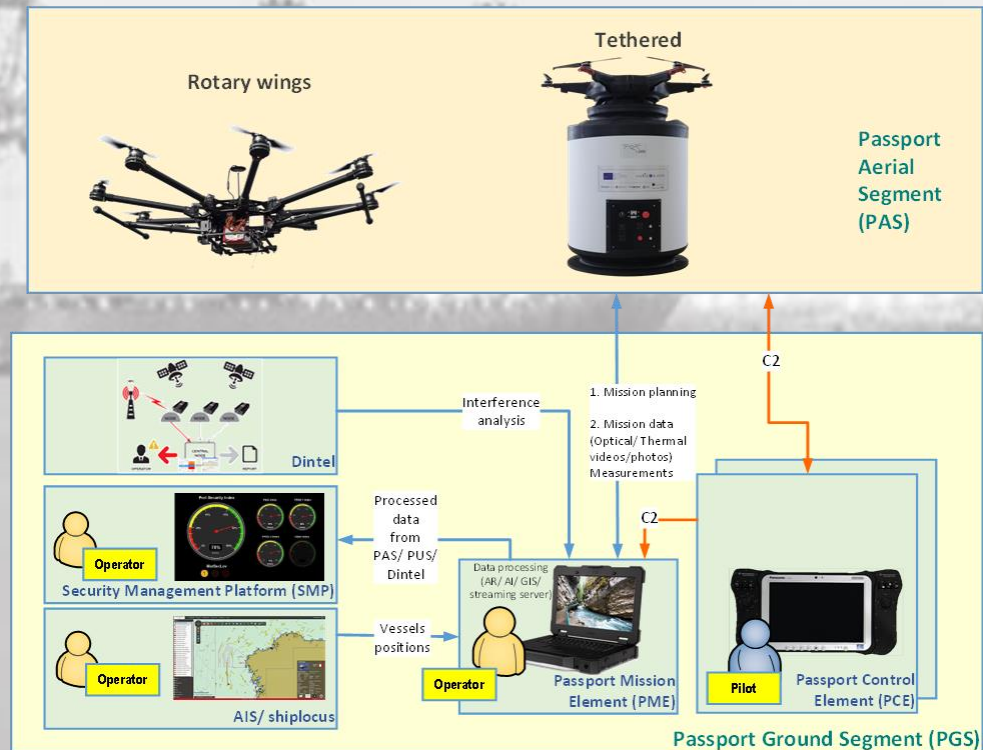
PORT OF HAMBURG

The Port of Hamburg (German: Hamburger Hafen) is a seaport on the river Elbe in Hamburg, Germany, 110 kilometres (68 mi) from its mouth on the North Sea. Known as Germany's "Gateway to the World" (Tor zur Welt), it is the country's largest seaport by volume. In terms of TEU throughput, Hamburg is the third-busiest port in Europe (after Rotterdam and Antwerp) and 15th-largest worldwide. In 2014, 9.73 million TEUs (20-foot standard container equivalents) were handled in Hamburg. The port covers an area of 73.99 square kilometres (28.57 sq mi) (64.80 km² usable), of which 43.31 km² (34.12 km²) are land areas.

PASSPORT ARCHITECTURE CONFIGURATION

PASSport configuration for this campaign is composed by:

- One (1) rotary wing tethered drone equipped by optical camera for distant video monitoring
- One (1) rotary wing drone optical camera for distant video monitoring
- One (1) control segment (PCE) composed managing the fleet of drones
- One (1) mission center (PME) where both real time (video for situational awareness) and data for post-processing are collected, processed together with Copernicus, validated and published. PME also manages all mission phases, i. e. planning, acquisition, processing, validation, reporting.
- One (1) Security Management Platform (SMP) used to trigger threats and activate relevant intervention procedures
- One (1) GNSS interference detection to check quality of GNSS signal
- Interface to already existing AIS systems, namely shiplocus, already managed by PASSPort consortium





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THE PILOT: Hamburg areas

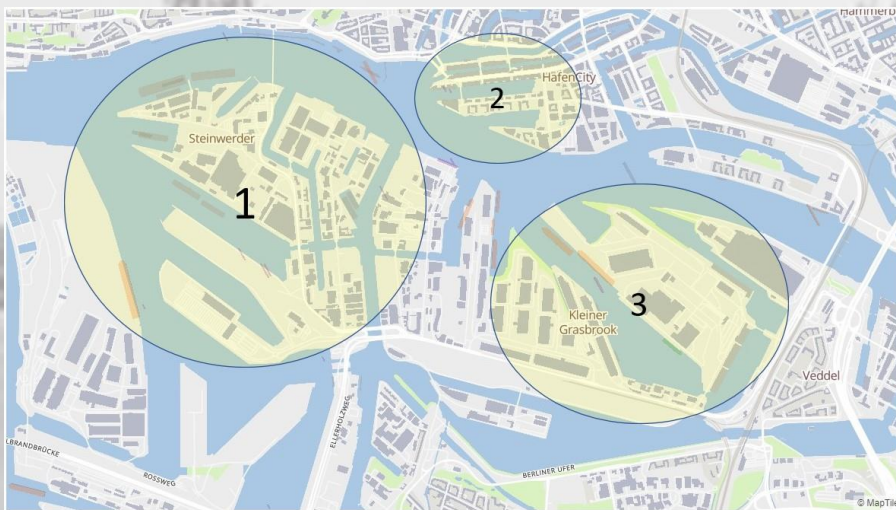
With the tides observed in Hamburg, the water levels at the Elbe River are changing massively. Deep draft vessels may only be able to enter the harbour by using high tide water levels and may need to sail with the tide into the harbour.

Within the harbour limits various critical infrastructure components are potential candidates for the PASSport campaign in Hamburg.

5 potential special focus areas for the Hamburg campaign are identified

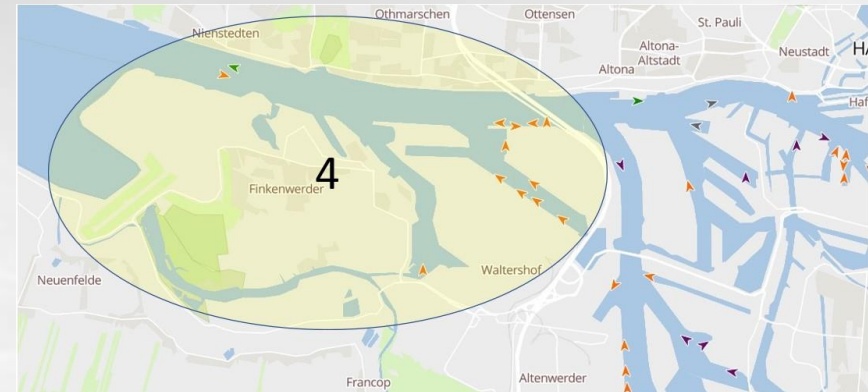
Focus area 1 is the harbour section Steinwerder. Here both cargo operations (e.g. Container and bulk) as well as ship building and repair is located. Larger military ships are constructed or refit here and there is a larger cruise terminal in this part of the harbour. In focus area 2, the “HafenCity” hosts prominent tourist attractions, like the Hamburg opera, the historic “Speicherstadt” or the living quarter “HafenCity” are building an ensemble of well know landmarks with specific need for protection. Key offices of the Hamburg Port Authority are located here as well.

Focus area 3 focuses on car carrier as well as reefer cargo are in this area.



Another special focus area (4) in Finkenwerder. For one it holds larger container and wet bulk terminals but it also is home of the Airbus factory with an airport for test flights. Finally focus area 5 “Altenwerder” is a large container terminal area. Of specific interest is the “Köhlbrandbrücke”, a bridge build so allow also larger container ships to allow

passing towards the terminals, but very large container vessels may need to observe the available air draft.





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