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“Be prepared for the unexpected”: Rheinmetall’s Herold and Herold Navy surveillance and alert systems

Successful surveillance and reconnaissance operations require comprehensive detection capabilities and reliable identification of ground, surface and airborne threats on land and at sea as well as at various altitudes – both day and night and under adverse weather conditions.

Despite their many advantages, radar-based solutions feature a number of drawbacks: they are active, susceptible to jamming, cannot assure complete coverage, and may generate clutter when the radar beam bounces off non-targets such as waves, mountains or trees. Finally, when radar detects a potential threat it generates an electronic signal rather than a real image of the target. These disadvantages can be offset by deploying passive infrared systems.

Two unique state-of-the-art system solutions, Herold and Herold Navy, are on display at FIDAE 2014 in Santiago de Chile.

Herold and Herold Navy are electro-optical surveillance and fire-control systems which assure continuous 360° surveillance, detection, alerting and simultaneous tracking of more than 256 moving ground/surface and airborne objects. Herold Navy is fine-tuned for use on naval vessels. The combined key capabilities of the Herold (land) and Herold Navy (sea) system solutions enable the operator to constantly generate and maintain the optimum situational awareness.

Herold and Herold Navy encompass two sensor systems:

- Covering the complete angular range in azimuth, the “Fast InfraRed Search and Track” (FIRST) surveillance sensor offers outstanding performance, assuring simultaneous detection and display of multiple ground/surface and airborne targets within a complete real-time panoramic thermal video stream featuring an adjustable elevation beam from -21° up to +33°. Herold Navy uses a 2-axis stabilized version of FIRST.

- A wide choice of E/O sensor systems for target verification, tracking and fire control, all of which feature a thermal imager, an eye-safe laser rangefinder and daylight camera, provide a long-range target detection and identification capability. All these stabilized platforms can be installed on almost any moving platform on land or at sea.

FIRST and the dedicated target verifier come with a sophisticated video image processing capability for automatic target detection and automatic tracking with continuous calculation of 3-D target characteristics (latitude and longitude coordinates, speed, course, altitude), which are displayed on a dedicated map for improved situational awareness.

An additional multi-mode multi-target tracker assures robust tracking capabilities and offers various search parameter settings for automatic target reconnaissance (ATR) to reduce false alarms as well the workload of the operator during extended missions.

At FIDAE 2014 Rheinmetall is showcasing the Naval Electro-optical Stabilized Sensor System (NEOSS) as an example of the second component of the Herold system.

Specifically designed for smaller vessels, NEOSS can also operate on land-based platforms or as a standalone system. It offers interfaces to external sensors and effectors such as radar or guns.

In the standard sensor configuration, it consists of three units: a sensor head, which contains a thermal imager, high-resolution colour CCD camera and an eye-safe laser rangefinder; a stabilized pan and tilt head; and the operator and control unit.

The stabilized NEOSS provides an around-the-clock vision capability, including in conditions of poor visibility. Its integrated eye-safe laser rangefinder can be used to generate 3-D tracking data. Furthermore, the video processing unit includes automatic target reconnaissance (ATR) and line of sight (LOS) functions. The combination of ATR and pre-programmable search patterns enables automatic area surveillance.

Herold and Herold Navy feature the following key capabilities:

- Automatic detection, alert, verification and tracking of ground, sea and airborne targets;
- high sensor sensitivity and long-range capability due to cooled IR sensors;
- multi-mode multi-target tracking of more than 256 targets (FIRST);
- 3D-target data (coordinates, speed, course, altitude);
- multiple dedicated deployment strategies (virtual fence, scanning, etc.);
- map display for improved situational awareness;
- data recording;
- target assignment and fire control;
- network-enabled capabilities;

Herold and Herold Navy provide dynamic, high-precision, reliable surveillance capabilities in a wide array of operational scenarios: airspace observation, ground/surface and coastal surveillance, border control, observation of harbour, airfield/airport installations, forward operating base protection or air, ground and surface defence applications for various gun and missile systems.

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