TERMA SCANTER
Enhanced SMR (eSMR)
Information always adds

TERMA INTRODUCES ENHANCED SMR (eSMR)
For the past +20 years, the traditional ground movement radar has been the primary sensor providing surveillance input for Advanced Surface Movement Guidance and Control Systems (A-SMGCS) with reference to e.g. the EUROCAE ED-116.

The flexibility of software-defined radar systems and advances in digital signal processing now allow for processing more information. This improves the situational awareness capability significantly within the same physical envelope.

Based on all this, Terma introduces the SCANTER eSMR; enhanced primary surveillance for the A-SMGCS.

UNIQUE CAPABILITIES OF THE eSMR:
- High update rate, 1 second as opposed to 5 seconds typically. Approach corridor surveillance Airport Surveillance Radar (ASR) gap filler, providing simultaneous coverage of movements on the ground and near the aerodrome by adding Doppler processing (air channel).
- Accurate, high precision, approach corridor surveillance allowing positive confirmation of correct runway alignment for inbound traffic.
- Improved detection and tracking in high clutter density areas e.g. infield grass areas and along runway edges.
- Possible detection and classification of various moving targets, including birds, within and above the aerodrome maneuvering area.
- Embedded Plot extraction- and tracking fully independent of the A-SMGCS backend system with radar video in standard ASTERIX format.

The target track accuracy of <15m in range and 3.5m/km in azimuth will allow positive confirmation whether an inbound aircraft is correctly aligned for the assigned runway. This is a further prerequisite for detection of small moving objects like UAVs and/or flocks of birds.
In many cases, the PRS/SSR equipment is located at some distance from the airport. This affects the ability to report the target position accurately and limits the necessary line of sight required for detection on the final approach. Given the physical location within the airport, the eSMR can be optimally located to detect arriving and departing aircraft.

Sub-clutter-visibility is another feature provided by eSMR. This allows detection of targets otherwise not visible. Consequently, airborne targets/objects will be visible during the final approach. In this stage, accurate PSR data is often not available.

The eSMR will increase the instrumented range from typically 3-4,000m to 10,000m and provide primary detection >60 sec prior to touch-down in the 3-degree glide path angle.

**ENHANCED GROUND SITUATIONAL AWARENESS**

Previously, detection and tracking has not been achievable regarding objects moving close to the edges of runways and taxiways and airside service roads. This is a challenge in an airport. To the air traffic controller, a careful balance between detecting and tracking objects of interest without increasing the false alarm rate is always the main objective. Consequently, track masks are typically defined, leaving a guard zone due to clutter from the boundary between the asphalt and infield grass area. In certain situations, a vehicle driving along and near the runway will not be detected by the normal processing. Consequently, tracking of the vehicle is impossible in such areas.

With the eSMR, it is possible to feed both streams of data simultaneously to the embedded tracking processor, which ultimately provides the final track output suitable for ATC purposes. External radar data processors typically work on 8-bit video. Simultaneously the embedded solution utilizes the full dynamic range of 14-bit in addition to receiving the video feed simultaneously from both the available processing channels.

**SOLID STATE AND SOFTWARE DEFINED RADAR SENSORS**

Previously, solid-state technology was exclusively available for defense applications. During the last decade, full solid-state technology, however, has been introduced for civilian applications and ATC.

The flexibility of a software-defined modern radar sensor provides the means to enhancing not only the fundamental capability of what is required for the A-SMGCS, but also providing additional data to different users with different primary objective than the tower controller.

Along the perimeter, a metallic fence is installed creating a permanent strong echo. And along the fence is a narrow perimeter road. The proximity of the two excludes positive detection of vehicles driving along the road, as these will merge with the background created by the fence. With the eSMR, all stationary objects are eliminated, allowing only moving objects to pass through the filter.