OERLIKON X-TAR3D®

TACTICAL ACQUISITION RADAR

PASSION FOR **TECHNOLOGY.**

RHEINMETALL

The Oerlikon X-TAR3D® is a three-dimensional tactical acquisition radar working in X-band and performing the functions of search, detection, acquisition, tracking, classification and identification of air targets, in order to supply a three-dimensional local air picture to command and control networks as well as track and threat data for cueing of fire control systems.

Its characteristics make the X-TAR 3D® the best product in its class in terms of:

- SURVIVABILITY, through high mobility and LPI (Low Probability of Intercept)
- FLEXIBILITY of use in multiple applications
- EFFECTIVENESS, through optimal low-level detection and advanced ECCM

SURVIVABILITY

The radar's compact design and the reduced weight allow an easy installation on board of light vehicles.

When integrated into a self-propelled vehicle and connected with a Vehicle Navigation System (VNS), X-TAR3D® is capable of fully operating when the vehicle is moving ("search-on-move"), ensuring its survivability through high mobility.

The low effective radiated power, by the use of specific waveforms with high compression gain, stacked beam architecture and extremely low antenna side lobe levels, make X-TAR3D® very difficult to intercept from radar warning receivers on board of aircraft or missiles (ARM).

FLEXIBILITY

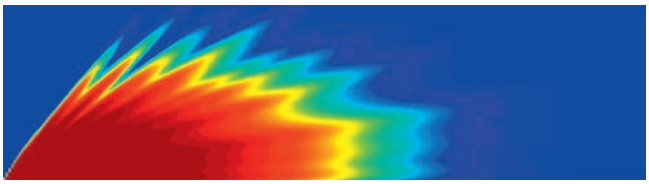
X-TAR3D® is a state-of-the-art radar, designed against a wide range of air threats, from conventional air breathing targets (fixed wing, helicopters) to low and very low cross section objects like stealth and unmanned targets (UAS, cruise missiles), up to rockets and mortar rounds (C-RAM mission).

OPERATIVE MODES

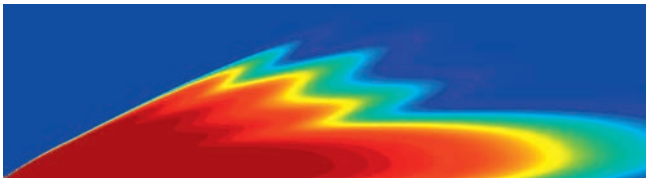
The X-TAR3D® modular design allows the capability to modify the radar characteristics in terms of antenna rotation rate, instrumented range and elevation coverage, in order to meet specific mission requirements.
The following three operative modes are provided:

- Combat: normal operation provided for air surveillance and air defence mission
- Surveillance: specifically to provide longer range air surveillance capability, typically when integrated into a sensor network as for early warning or gap filler
- Sense & warn: covering up to 70° elevation with fast antenna revolution (1 s), specifically designed against the asymmetric threat, represented by drones, rockets and mortar shells

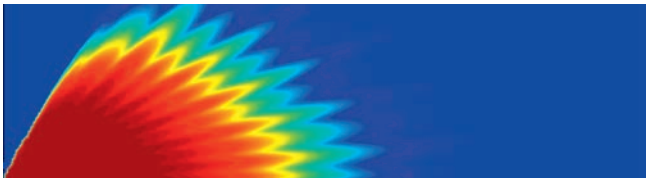
X-TAR3D® ANTENNA COVERAGE



Combat mode



Surveillance mode



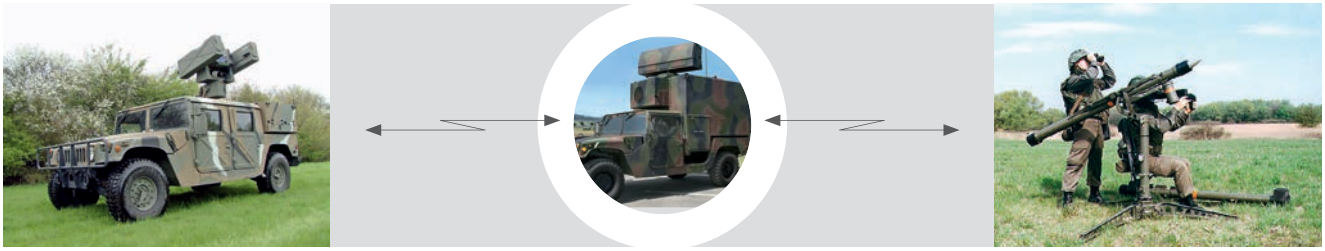
Sense & warn mode

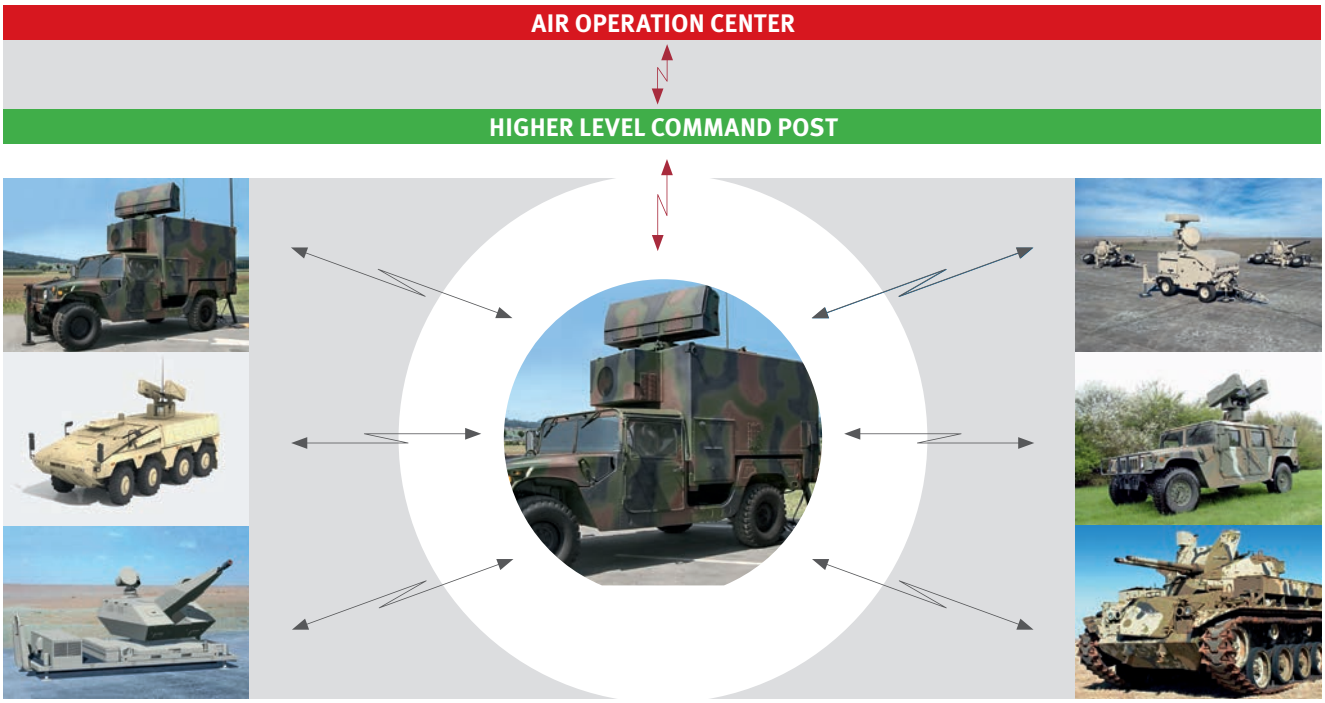
X-TAR3D® RADAR CONFIGURATIONS

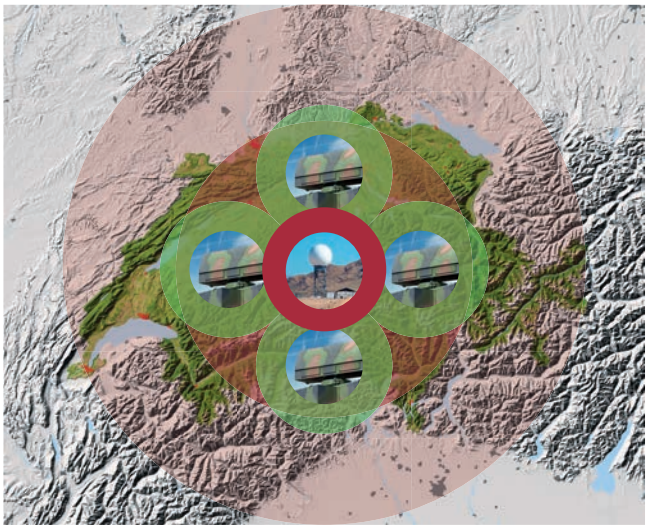
Main sensor of stationary air defence command and coordination centre to coordinate SHORAD and V-SHORAD weapon systems deployed in a wide area. Main sensor of highly mobile air defence command post to provide an effective air defence to forces on the road and/or to high value targets, cueing target data to the associated weapons, typically manpads and/or small calibre AA guns.

Dedicated voice and data communication links allow to alert, control and coordinate the associated weapons, as well as to exchange real time air picture information with higher level command posts.

X-TAR3D® COMMAND POST INTEGRATION





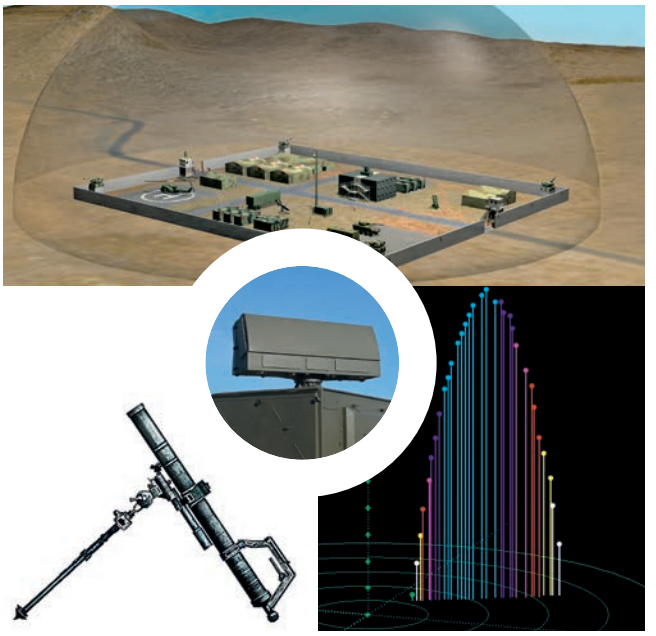


COVERAGE VS. TARGET ALTITUDE

>1,000 m 300 m 100 m

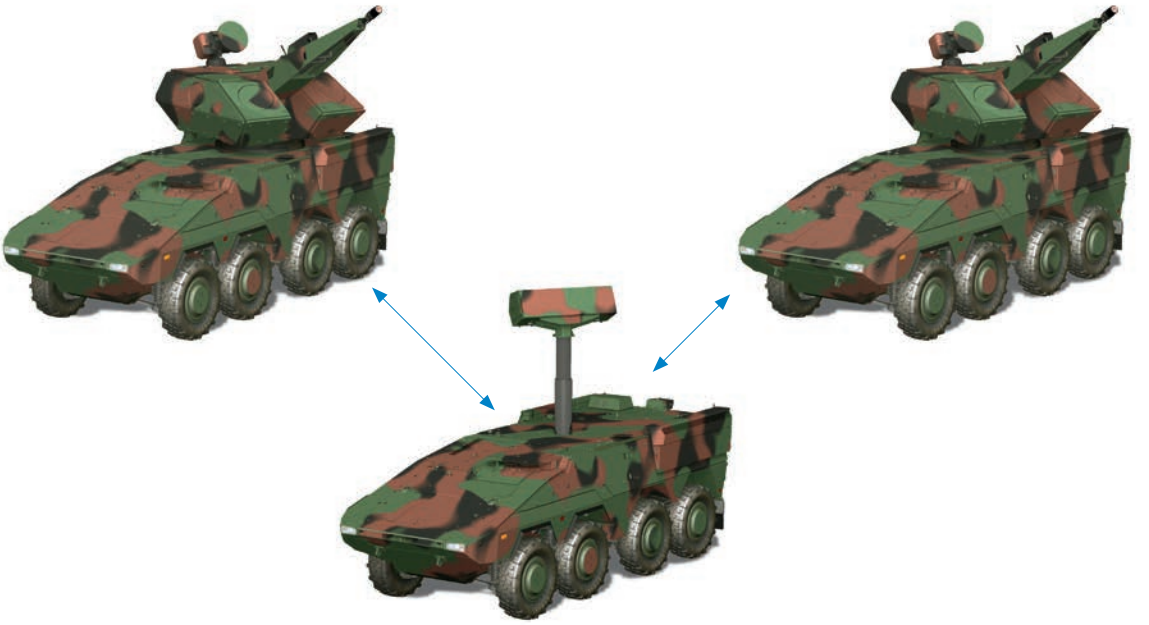
Gap filler sensor to complement the air surveillance capability of long range early warning radar in their blind sectors. Active sensor to perform the “sense & warn” function to protect camps or other tactical/logistic infrastructures in out-of-the-area missions against the asymmetric threat (rocket and mortar, small drone – i.e. micro/mini UAS). In case of ballistic shell the radar gives also an accurate and timely estimation of the point of impact (POI) to warn the personnel and the point of launch (POL) to cue the target data for the counter battery firing.

SENSE & WARN FOR CAMP PROTECTION



SKYGUARD FIRE CONTROL UNIT

SELF-PROPELLED GROUND BASED AIR DEFENCE



EFFECTIVENESS

X-TAR3D® is a fully coherent phased-array pulse Doppler radar. Elevation information is obtained through up to 12 simultaneously receiving stacked beams, which allow scanning the full search volume in a single antenna revolution.

The outstanding 3D target data accuracy and the high data rate result in a very short reaction time of the whole associated air defence system. The radar has provisions to interface with current and new generation IFF interrogators, capable of operating mode 5 and S in addition to mode 1-2-3/A,C and 4. The IFF antenna is fully integrated into the primary radar antenna unit.

X-TAR3D® is highly resistant in heavy ECM environment thanks to its antenna characteristics and an ECCM package designed in-house and extensively field-proven:

- Very low level antenna sidelobes
- Narrow antenna beam (azimuth)
- Low transmitted peak power (Low probability of intercept by enemy ESM – Electronic Support Measures)
- Wide frequency band
- Radiofrequency agility and PRF staggering
- Coded transmitted pulse (digital pulse compression)
- Fully coherent processing
- CFAR (Constant False Alarm Rate) detection
- Asynchronous pulse suppression
- Jammer strobes
- Automatic jammer initiation and tracking
- Adaptive logic for track initiation
- Anti “cover-pulse” logic
- “Receive only” capability
- Pulse width discrimination

X-TAR3D® radar antenna

IFF antenna

TECHNICAL DATA	
Radar	
X-band operation	
Fully coherent pulse Doppler	
Stacked-beam architecture	
Rx digital beam-forming and elevation monopulse	
Digital pulse compression	
Track-while-scan (TWS) with automatic and adaptive track initiation	
Track-on-jammer (TOJ) with automatic initiation	
Outstanding ECCM performance	
Antenna	
Vertical phased array	
Scan rate	1, 1.5 and 3 s
Coverage	
Instrumented range	25, 35, 50 km
Elevation	up to 70°, adaptable to mission requirements
Detection altitude	›8,000 m
Radar control	
Via Ethernet/fiber optics from a remote console	

Physical characteristics	
Dimensions	1.8 x 0.8 x 0.6 m
Weight	300 kg
Power requirements	3,500 W
Tactical functions	
Identification through integrated IFF	(mode 1-2-3/A, C, 4, 5, S)
Target classification	(fixed-wing, helicopter, missile, UAS, RAM)
Radar netting	
Navigation	
Search-on-move	
Logistic support	
Mean time between critical failure (MTBCF)	›1,000 h
Built-in test	
Fault tolerant (multiple transmitter/receiver architecture)	
Mean time to repair (MTTR)	‹30 min

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