Smart Border Surveillance Solution

www.armour.gr

www.armour.gr

Demand Pain Points

Border environmental conditions are relatively harsh, such as humid weather, fog, wind, etc., if the device can work continuously and stably?

In the low luminance environments at night, if the device can effectively do monitoring?

The detection distance of traditional monitoring device is only a few hundred meters. Is there any device that can cover several kilometers of border?

For multiple people and cars in the scene, Can the device classify and track multi-target?

In order to facilitate the rapid handling of the police work, can the device accurately locate the target and obtain accurate navigation information? (Speed, distance, direction)

Due to its special geographical environment, the border may have no network or electricity, which causes a great challenge to device networking. How to solve this problem?

Three-level Prevention Design and Control - Distance

First level
Defense Line

15Km to 20Km

Second level
Defense Line

3Km to 6Km

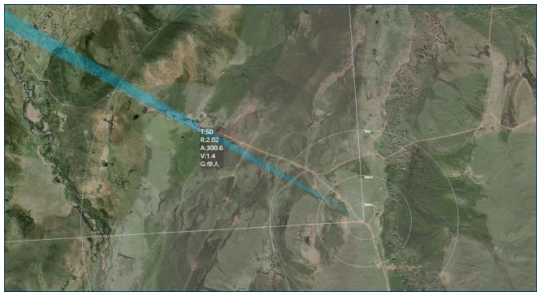
Third level
Defense Line

500m

www.armour.gr

Design of Three-level Prevention and Control-Functions

Surveillance radar



Long-distance Continuous Scanning Detection

Long range
Obtain comprehensive information: speed, direction and distance
High accuracy
Multi-target trajectory tracking

Infrared Panoramic Camera

Medium-distance Panoramic Visual Monitoring

- 360° panoramic coverage
- No blind area
- Target visualization
- Multi-target trajectory tracking

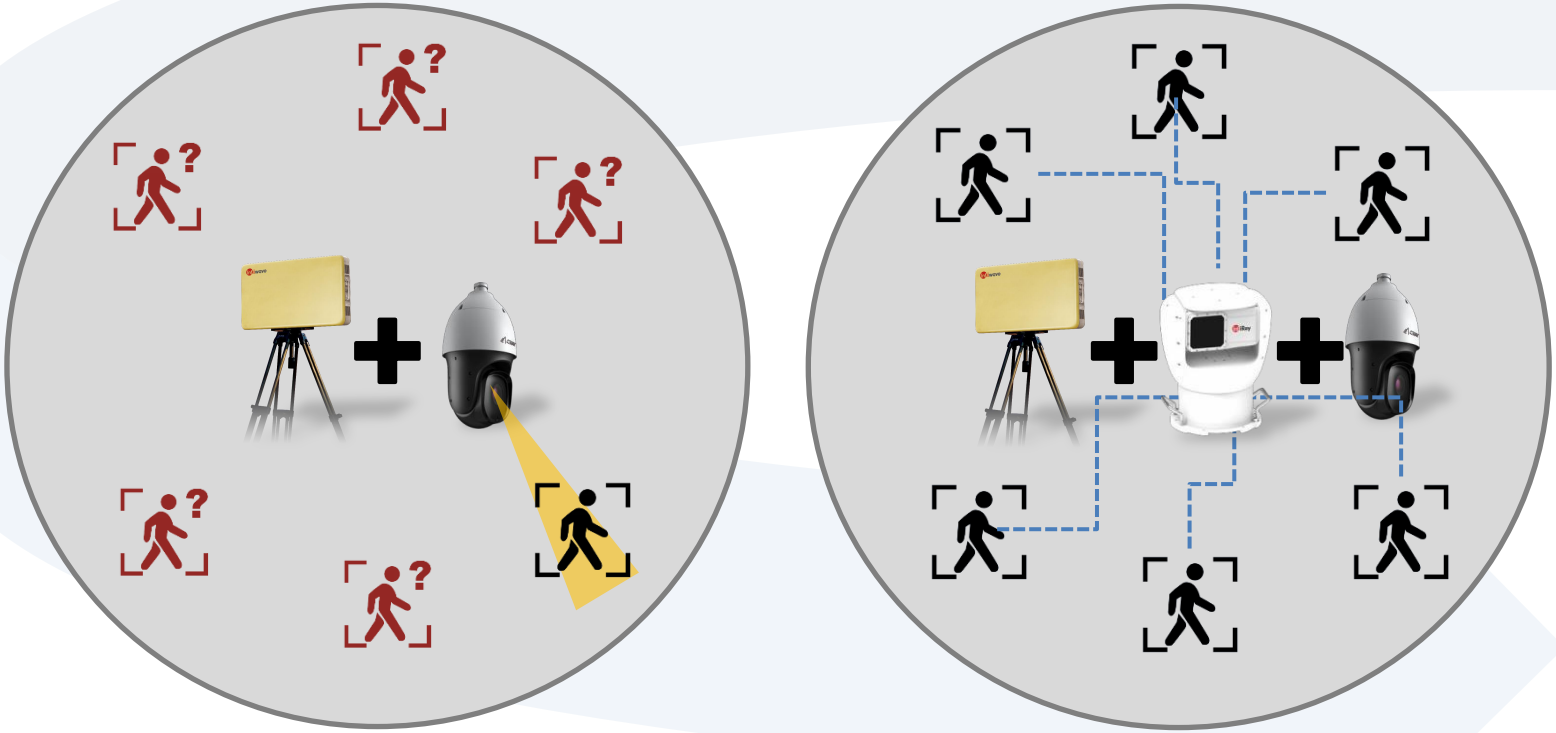
Dual-spectrum PTZ
Visible Light PTZ

Close-distance Single Target Tracking

- Obtain the color information of the target
- Focus on tracking single target and zooming in target
- Cooperate with radar and infrared panoramic device for linkage

***Note: If the user needs the visible image at night for linkage, a dual-spectrum PTZ camera can be selected.*

Design of Three-level Prevention and Control - Highlights

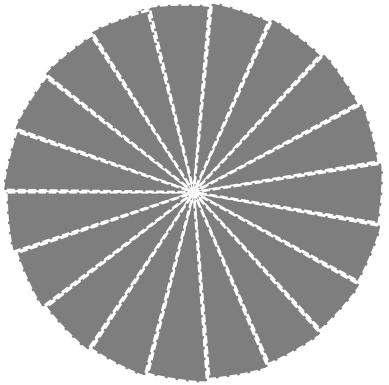


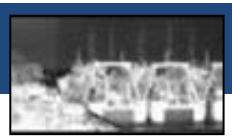
When multiple targets are detected by the radar, only one of these targets can be tracked through the PTZ solution at the same time; but with the panoramic camera solution, these multiple targets can be monitored and tracked at the same time, to ensure that the information related to the targets will not be lost.

First Choice of Wide-area Monitoring in Large Scenes - infrared panoramic camera

Infrared Panoramic Camera

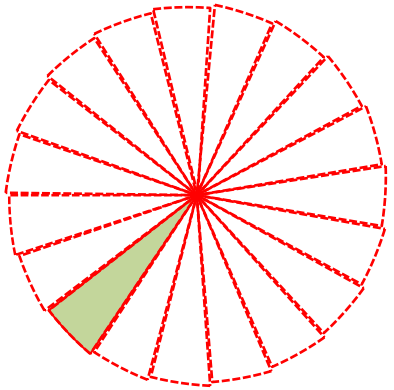
- 360° view with no blind area
- Real-time imaging, real-time panorama, and low rate of alarm omission





Traditional PTZ Camera

- Fixed narrow view
- Blind areas and alarm omission is easy to occur



www.armour.gr

Infrared Thermal Imaging Technology - infrared panoramic camera

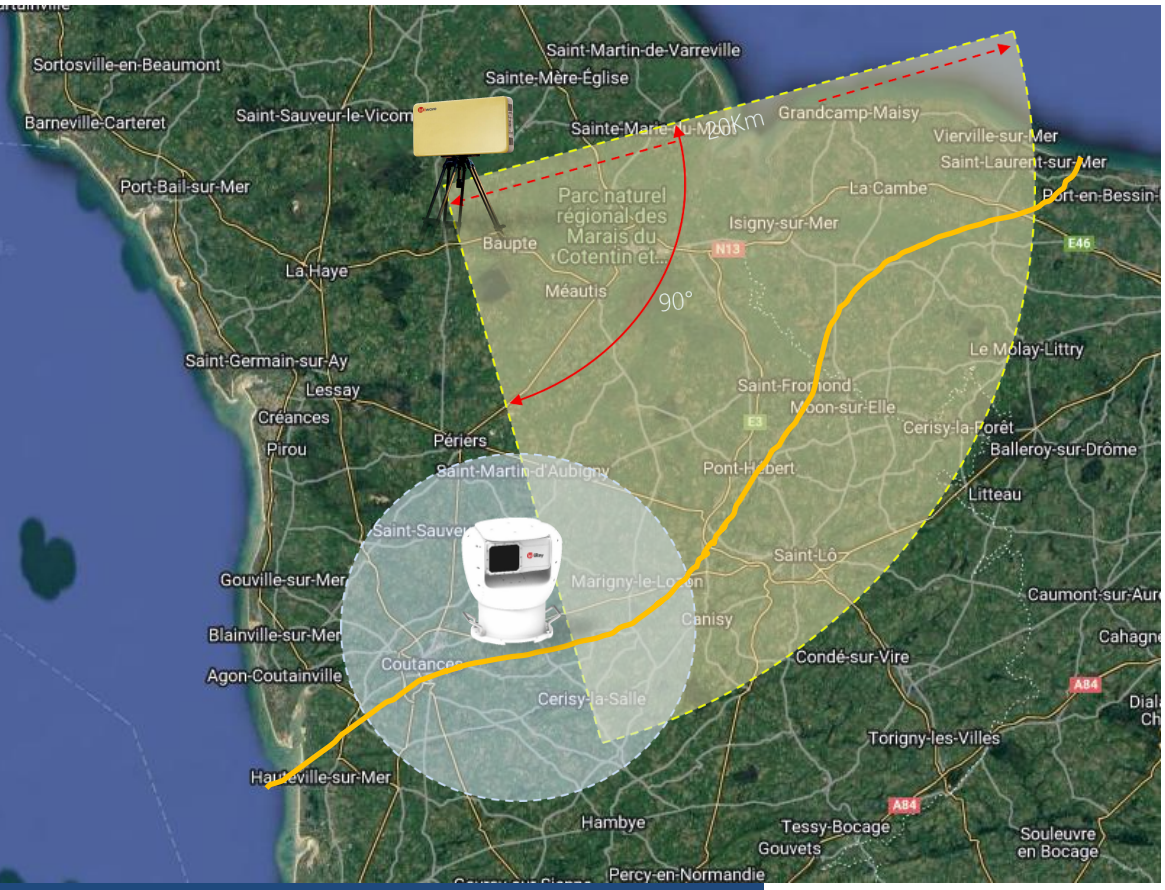
VS

By thermal imaging, see through the night
Compensate for the disadvantage of visible-light monitoring in darkness

Radar strong ability to detect small targets

- Phased array rapid scanning, high data refresh rate, minimum detection speed 0.2m/s
- Excellent signal processing algorithm, strong clutter suppression ability, effectively reducing false alarm rate and missed alarm rate
- It has high recognition and detection ability for low, small and slow targets

Location Deployment Design - Fixed Land-based Installation



Surveillance Radar:

- The maximum range of the radar is 20km. According to the different target monitoring demands (large/middle/small ships), different operating distances can be adjusted as designed.
- The FOV of a single radar is 90°. If you need greater angle coverage, you can increase the number of radars or increase the number of turntables as needed

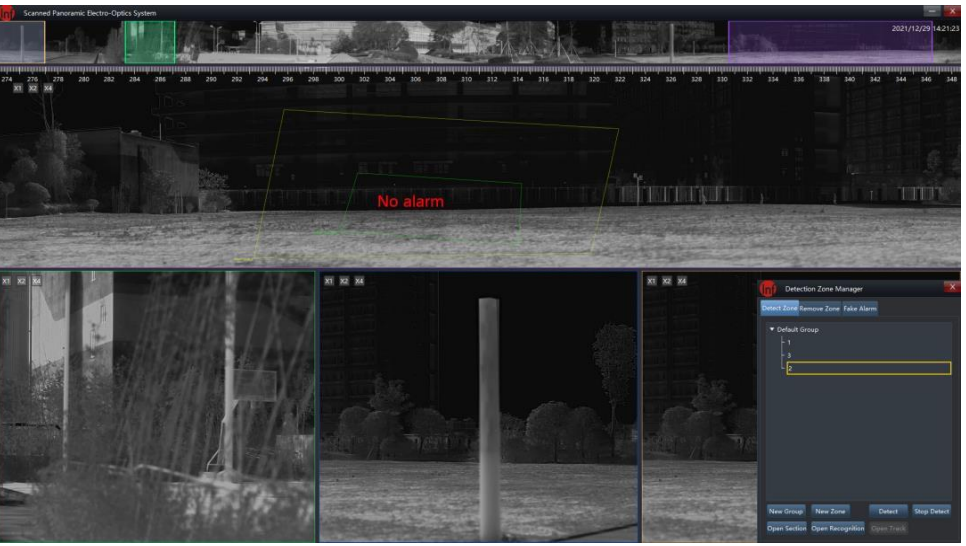
Infrared Panoramic camera:

- The maximum detection range of cooled cameras for the ships is 12km; uncooled ones is 8km (for ships with a length of about 8m).
- Different focal length products can be selected according to monitoring needs

PTZ:

- It is recommended to deploy the camera at a position relatively close to the radar and infrared panoramic camera on demand, which is conducive to improve the linkage precision.

Alarm Zone Setup - Virtual Electronic Fence



- Border are often planned with border line, For such areas, users can set Alarm Zones on the interface of the radar or infrared panoramic camera (support for setting multiple alarm zones)

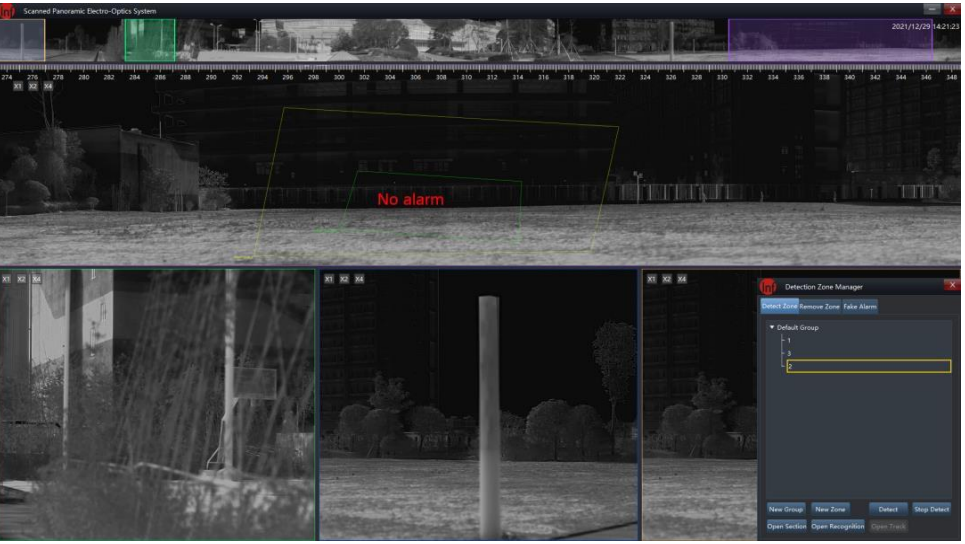
- Once unauthorized persons, drones, crawlers intrude into the zone without authorization:

① The radar will automatically locate and track the target, and report the position, speed, trajectory, and other accurate information of the target.

② The infrared panoramic camera triggers an alarm on the intruding
target, visually presents it, tracks and records the trajectory information, and conducts secondary judgement of suspicious targets

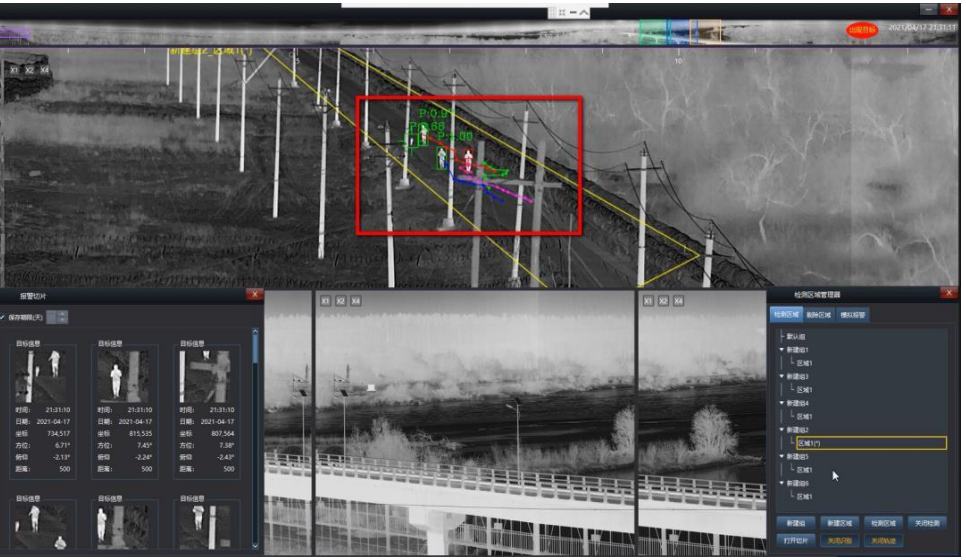
③ Finally, the visible light device is linked to do the final judgment
and further disposal

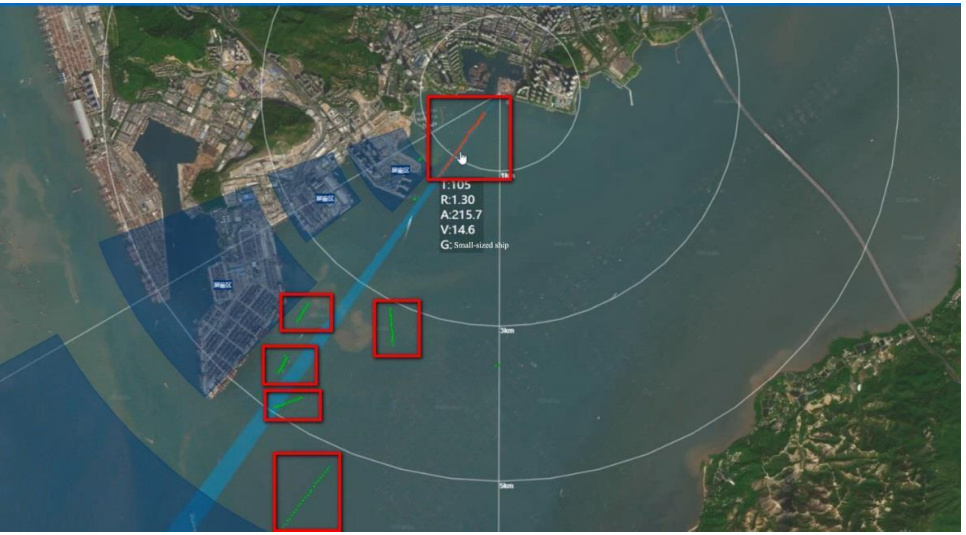
Shielded Zone Setup - Legal, Non-key Zones



- For the border non-key zones, reasonable zones, and other zones, the user can set up shielded zones in the above zones.
- The system does not trigger alarm for the targets in the shielded zones, which can be intelligently distinguished from other alarm zones.

Multi-target Detection Capability

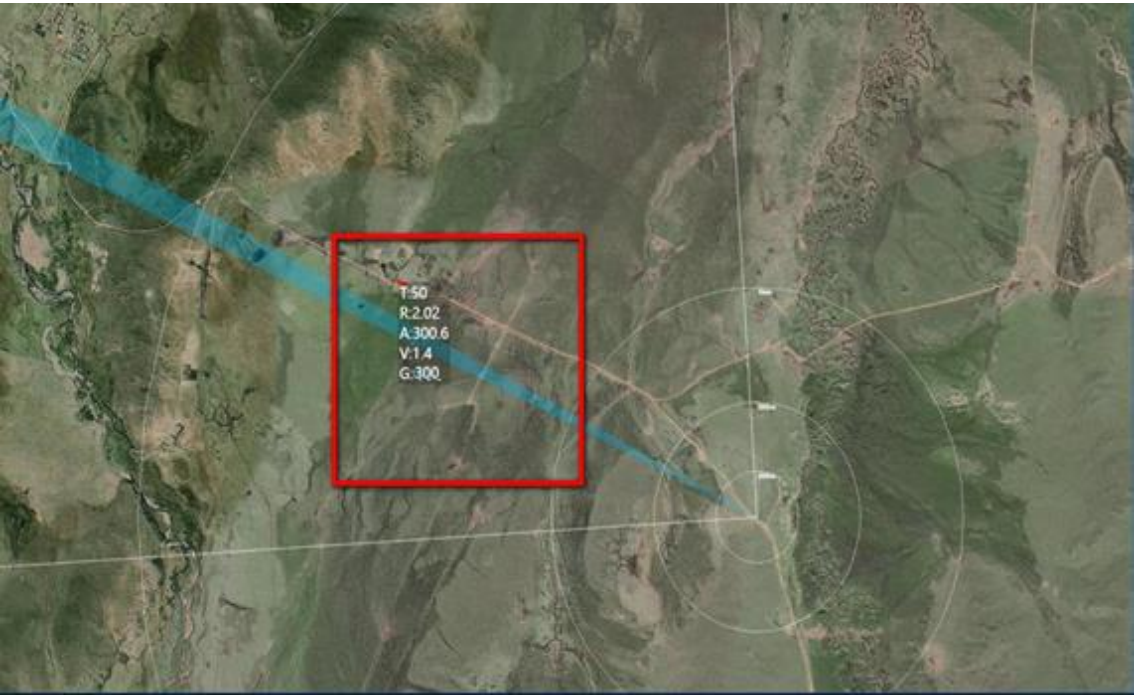




- Both the radar and infrared panoramic camera support detecting the multiple targets intruded in real time, and display the movement tracks of the targets.
- The recommended number of targets to be supported by the infrared panoramic camera is less than 128, which is mainly determined by the performance of back-end hardware.
- The number of targets supported by the radar system is more than 128.

Visualization of Target Parameters – Surveillance Radar

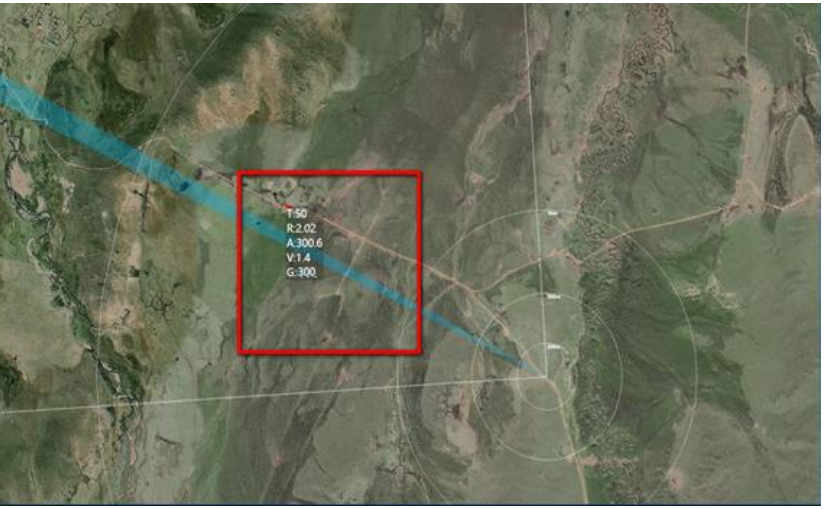
- After detecting the target ships, the radar system can directly present the parameters related to the targets in the image, including the distance, speed, azimuth angle, movement track, and classification of the targets.
- It helps the user to quickly master the situation of current monitoring scene.

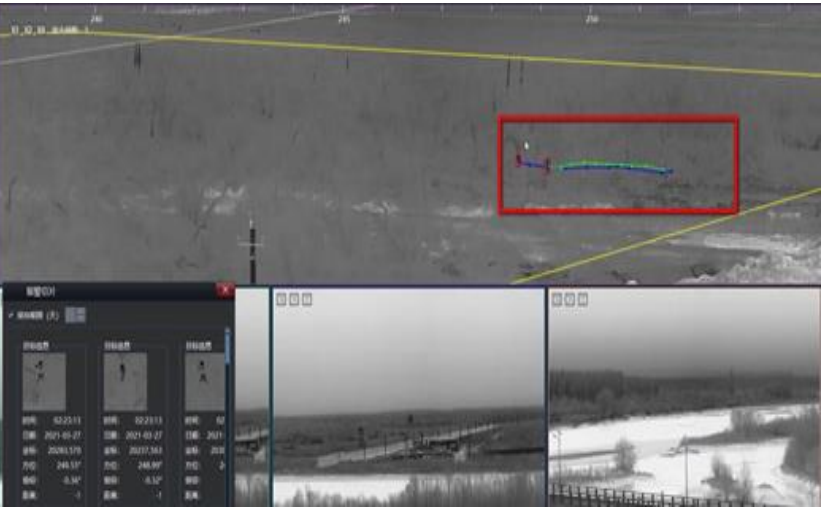


Surveillance Radar

www.armour.gr

Visualization of Movement Tracks



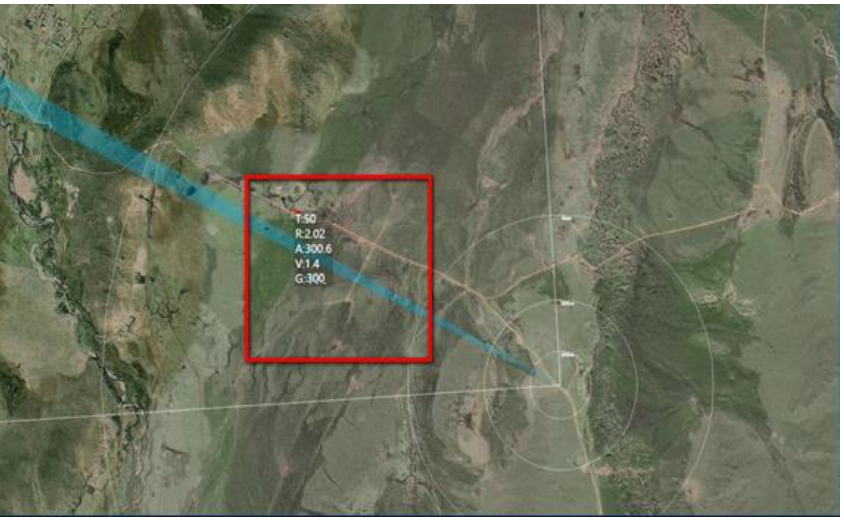


- Both the radar and infrared panoramic camera support summarizing the movement information of targets, and visually presenting the movement tracks of the targets at last.
- By combining with the information related to historical tracks, it helps the user to predict and judge the moving trend of targets.
-

Surveillance Radar

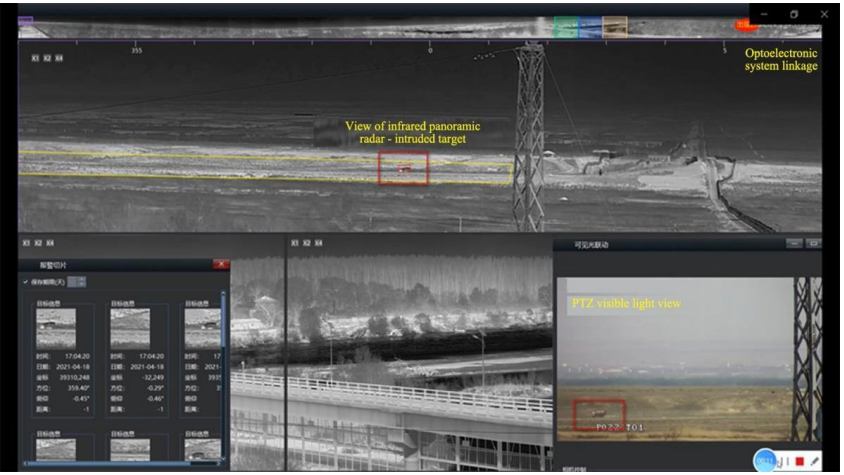
Target Classification Capability – Surveillance Radar

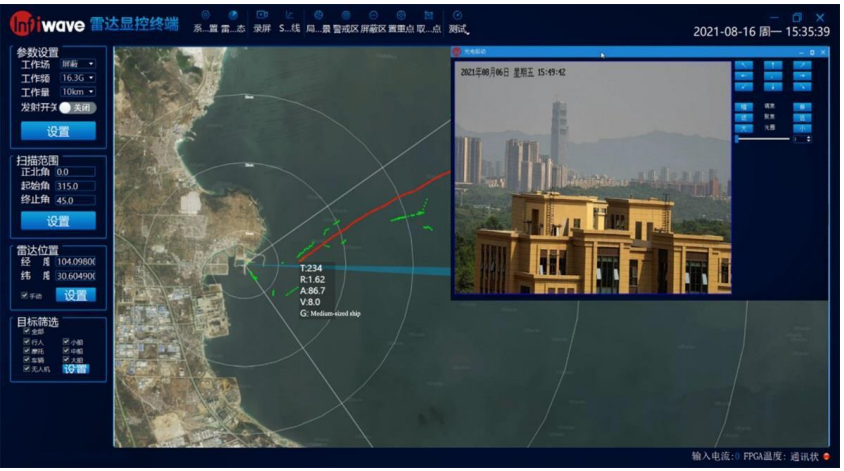
- With the optimized maritime scene algorithm, the radar system supports classifying targets, including personnel, vehicle, UAV.
- It helps the user to judge and handle suspicious targets.



Surveillance Radar

Intelligent Visible light device Linkage





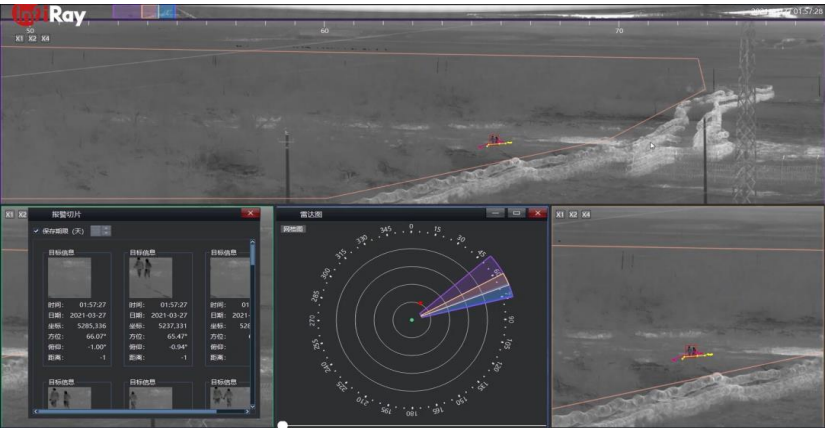
- Both the radar and infrared panoramic camera support tracking the targets and zooming in images of the targets by combining with the visible light device, and collect the information related to videos and images and obtain relevant evidence, thus visually presenting the information of targets once the targets are detected.
- It helps provide strong reference information for the decision-making and command staff.

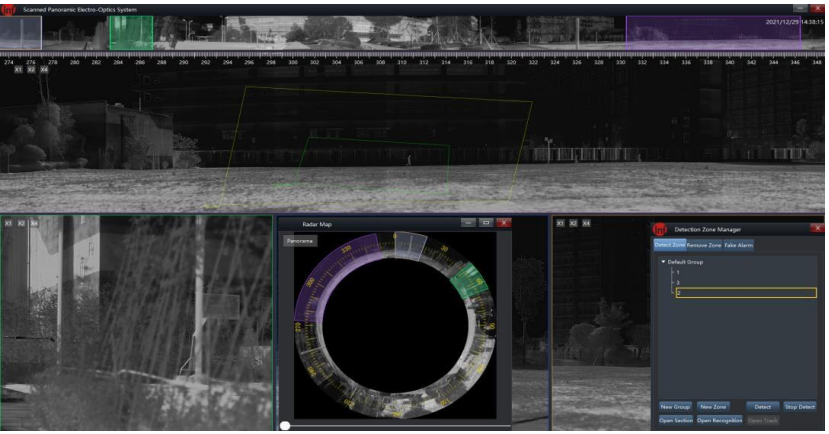
Dual-spectrum PTZ

Visible light PTZ

www.armour.gr

360° Radar View - Infrared panoramic camera





Two panoramic modes are supported by the interface of the infrared panoramic camera system for display:

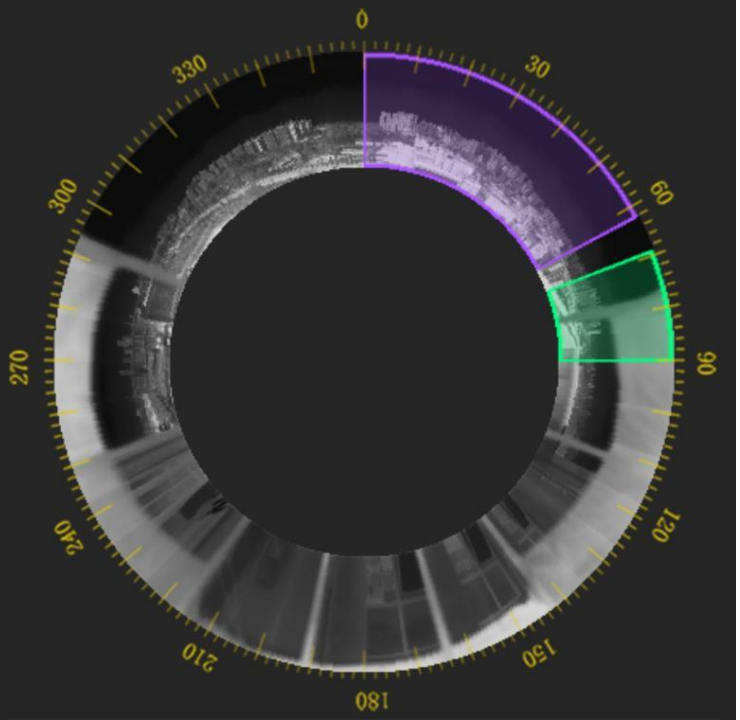
① 360° radar view. The information of the red point in the image is the position information of the target. Moreover, the red point will move with the target, showing the dynamic display of the alarm.

② Visual panoramic radar view. The user can drag the color box to switch different monitoring pictures.

Infrared Panoramic Camera

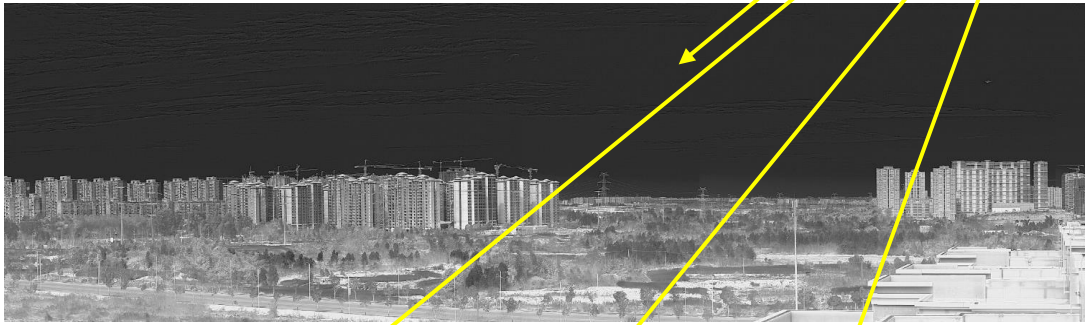
Diversified Preview Modes - Infrared panoramic camera

360° Image

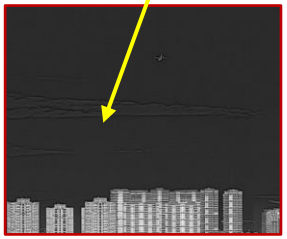


Panorama Overview

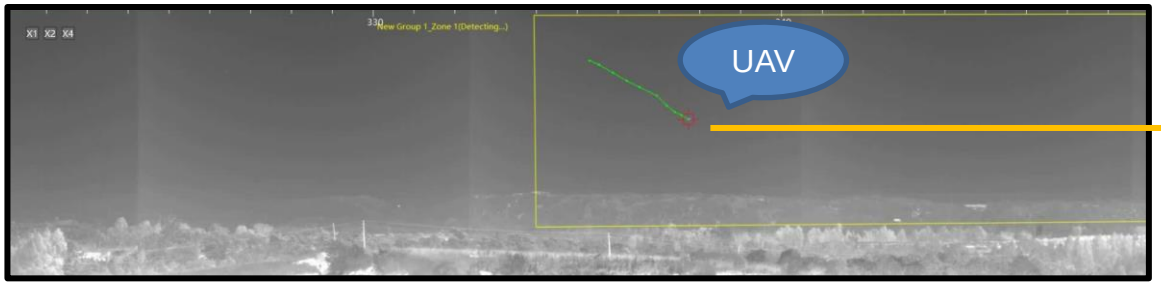
Main Monitoring Area

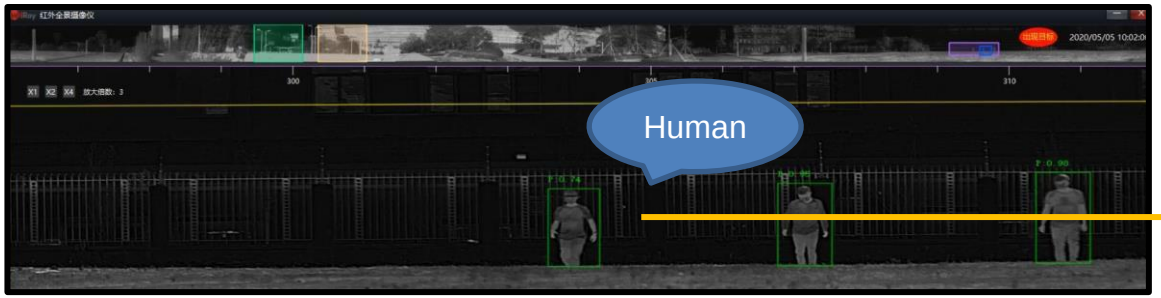


Key Monitoring Area



Detection Categories of Intruded Targets - Infrared panoramic camera





Border Surveillance Radar

Ku-band pulse Doppler radar **INFIWAVE S20-G**

Technical Specifications		
Operating Frequency	Ku	
Transmission Power	40dBm(10W)	
Azimuth Range	±45° (settable)	
	360° (thermal imager/multi-array)	
Angle of Pitch	8° (mechanical ±10° adjustable)	
Minimum Operating Distance	90m	
Distance Precision	3m	
Azimuth Angular Accuracy	0.3°/0.5°（optional）	
Typical Target Detection Range	UAV (RCS 0.01m^2)	3km
	Walking person (RCS 0.5m^2)	7km
	Small vehicle (RCS 4m^2)	15km
	Middle vehicle (RCS 20m^2)	20km
Range Resolution	10m	
Ingress Protection Rating	IP66	

GPS/Beidou | Intrusion | UAV Detection | Vehicle Detection | EO | Low FAR | Trajectory Tracking

www.armour.gr

Infrared Panoramic Camera

XSENTRY

Model	Focal Length
XSENTRY-U6 640×512/uncooled	25mm, 55mm, 75mm, 120mm
XSENTRY-U12 1280×1024/uncooled	55mm, 75mm, 120mm
XSENTRY-C6 640×512/cooled	110mm, 150mm

Personnel Detection

Perimeter and Regional Intrusion

UAV Detection

Vehicle Detection

Animal Detection

Long-distance Fire Detection

Track Visualization