How to setup an accurate perimeter guarding system with DeepinMind NVR

HIKVISION TECHNICAL SUPPORT TEAM

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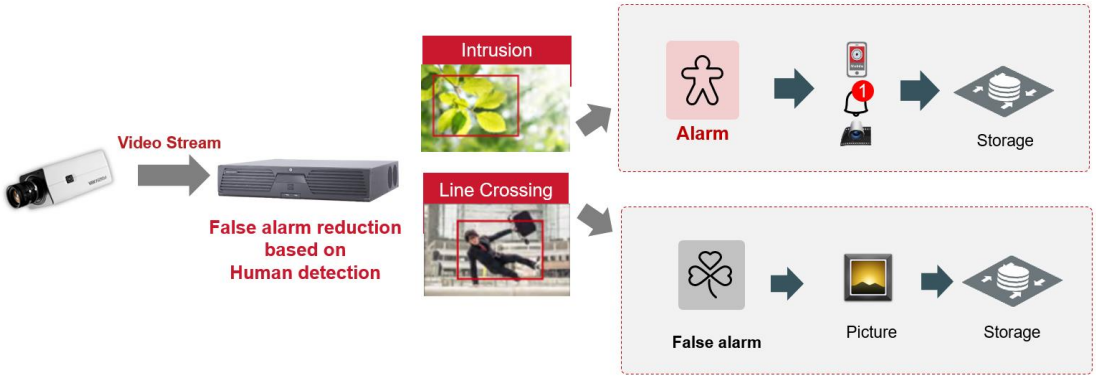
This quick guide shows you how to set up an accurate perimeter guarding system with the iDS-7700NXI-I4/(P)/16S (B). All operations in the quick guide are based on firmware version V4.1.31, it various on different firmware version.

1. Basic introduction

In traditional surveillance system's, all moving objects trigger the perimeter guarding alarm, a large amount of false alarms need to be eliminated essentially.
Hikvision's new AI NVR -- iDS-7700NXI-I4/(P)/16S (B), with Hikvision deep learning algorithm, it reduces false alarms triggered by irrelevant targets, such as animals and leaves to increase detection accuracy considerably.
It supports reducing false alarm for 2 events: line crossing, intrusion detection.
Note: The aim of the system is reducing the false alarm rate, not filtering out all false alarms. The performance may vary in different scenarios.



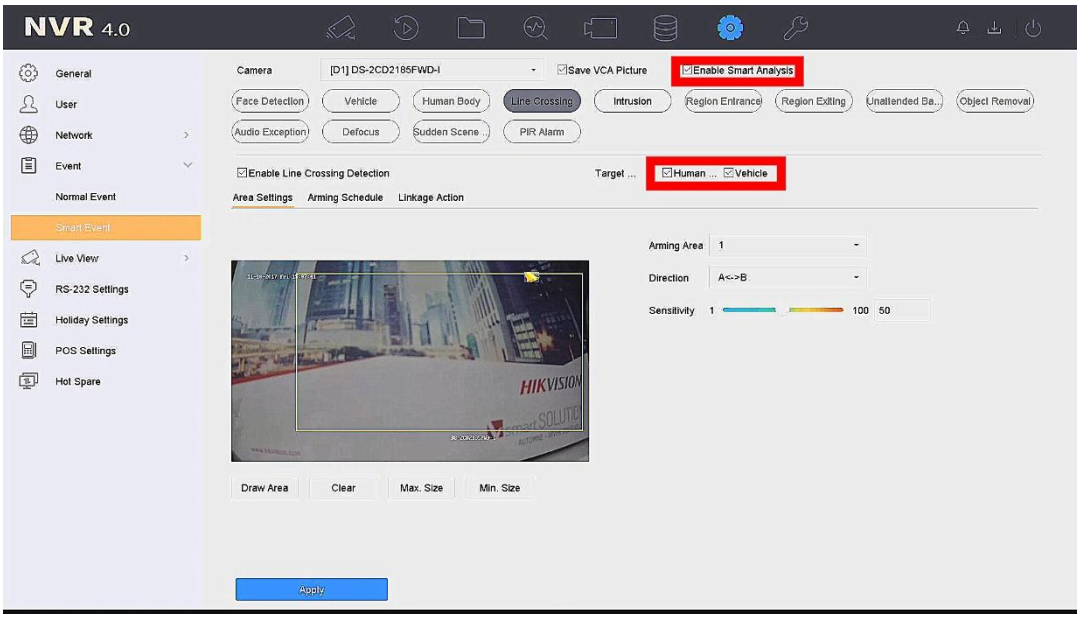
2. Operation

(1) False alarm reduction

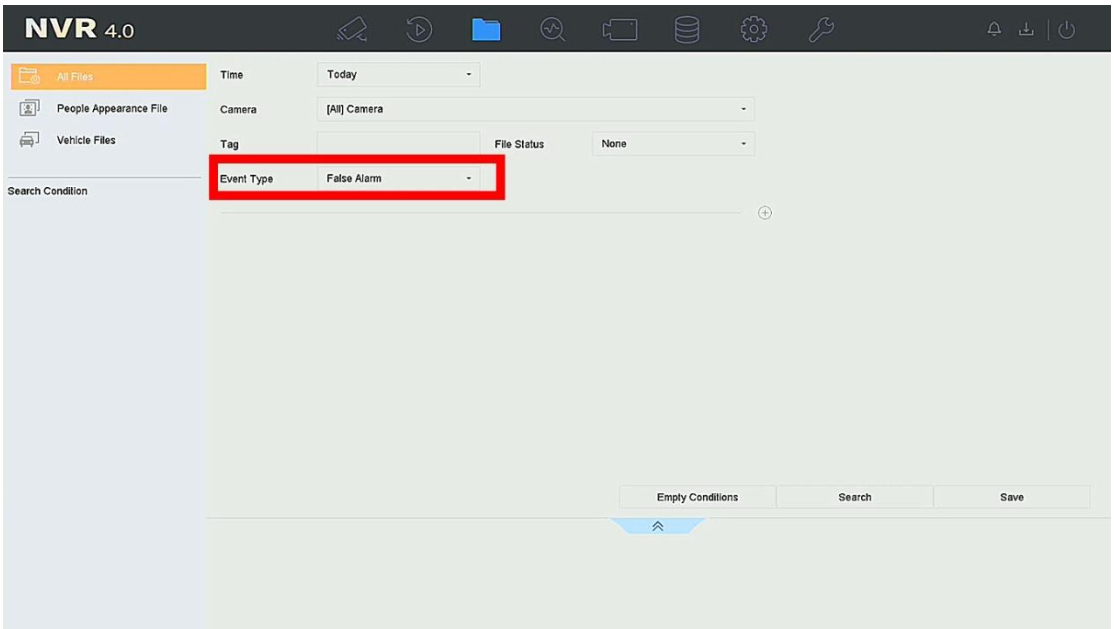
Go to NVR's local GUI, ***System—Event—Smart Event***, ticked the box '**Enable Smart Analysis**', choose and enable the event you want to detect, then check 'Target of interest'. You can choose between 3 modes: **Human**, **Vehicle** or **Human& Vehicle**. Once you enable the option(s), it will based on the algorithm to filter most of the false alarm.

NVR can analyze up to **16-ch 1080P IP cameras (8-ch 4MP, 4-ch 8MP)**.

IP camera's video stream should be **standard H264/H265**, minimum frame rate is 15fps, in addition, the resolution of camera must be between 2MP to 8MP.



After the alarm is filtered, NVR normal playback and file management can only search alarms that recorder has identified to be a correct alarm, if you want to check false alarms, please go to 'File Management—Event Type—False Alarm'.

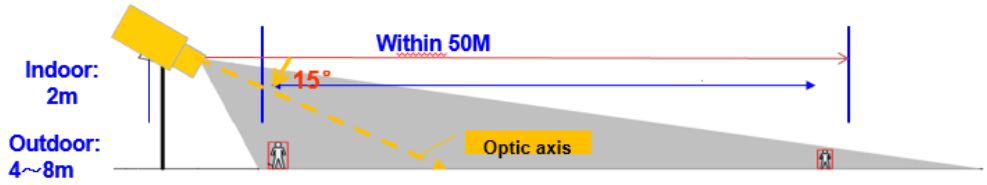


3. Scene and Rule

In order to make the whole system more accurate, there're some mounting and rule requirements for IP cameras.

In this chapter, we take several typical scenarios as examples to help you setup a better perimeter system.

(1) IP camera installation



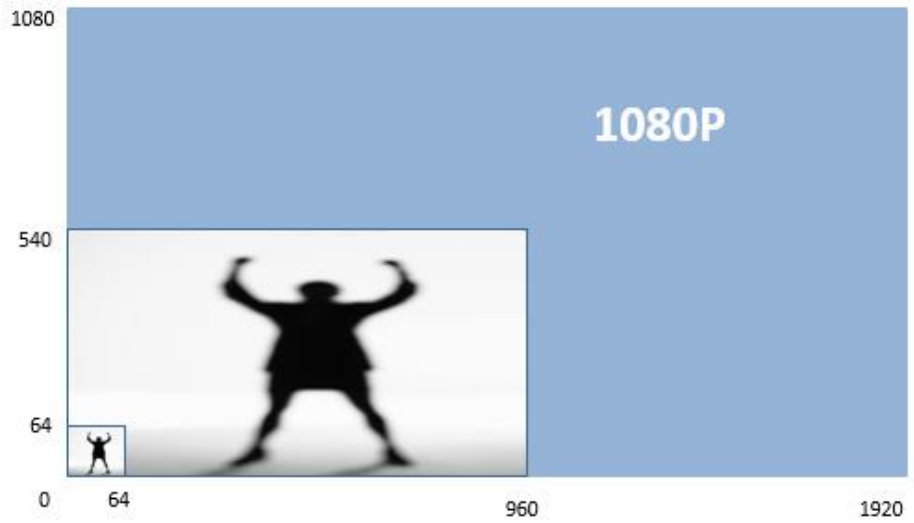
Camera is recommended to be installed 2-3 meters high. If it is installed externally, it could be 3-8m high.

The monitoring distance is recommended to be within 50 meters, estimated longest distance for different focal length: 6mm, 30M; 8mm, 40M; 12mm, 50M, this is just a reference, it varies in different scenarios.

Angle between the optic axis and the horizontal line should be larger than 15°.

(2) Target size

DeepinMind NVR can analyze a target whose height is between 1/16 and 1/2 of the image vertical size. For instance, IP camera resolution is 1080P, target vertical size should be larger than 64 pixels and smaller than 540 pixels.



For example, the target in the picture below is too large to detect, the man almost covers the whole scene. We suggest adjusting the angle higher so that IP camera can start detecing from a longer distance.

(3) Illumination

It's easy to deduce that once the scene is dark, IP camera or NVR can't detect target exactly. Lighting supplement, IR or darkfighter cameras are recommended in scene below.

(4) Obstacle

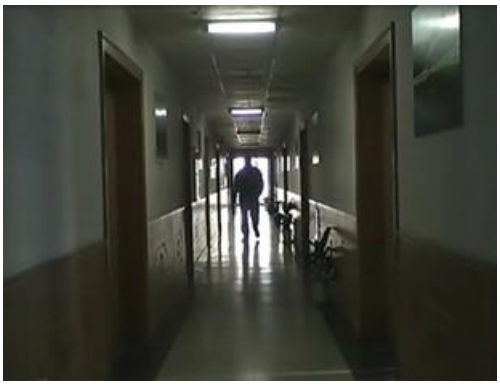
If there're obstacles in front of the camera, there will be considerable false alarms which occupy NVR smart resources. In addition, large obstacle might block target you are really interested in. Scene in picture below is not an appropriate one for detecting.

(5) Strong light

In some scenarios, strong light interference makes a target hard to be detected. Strong light generally can be divided into two kinds: strong background light and strong foreground light.

Strong background light makes foreground target totally dark, as what is shown picture below, the man in corridor looks like a shadow. WDR or BLC function is recommended in this scene.

Strong foreground light is usually generated by sudden light intensity change such as car light, flash light, sunshine reflection. We suggest customer change IP camera's angle to avoid strong light or use cameras with HLC function.



(6) Complex scene

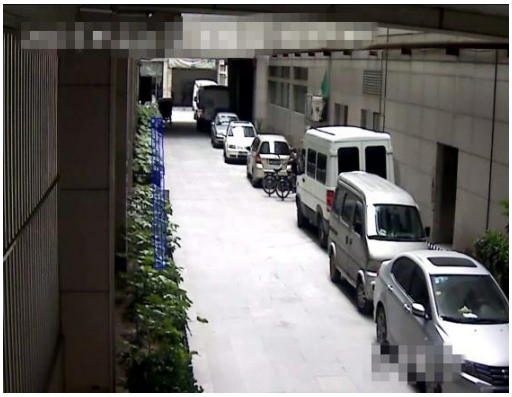
We suggest customer use perimeter guarding alarm to detect human who is not supposed to enter a region or cross a line, so it's not applicable in a scenario such as train station with large people flow.

The scene below has too many people and create a vast number of alarms, it's not a recommended scene for detection.

(7) Detection rule

In addition to installation guide, appropriate rule is also a critical part in perimeter guarding system.

Here's an example, customer wants to detect man who walk across the door on the left side. However, the rule is too near to the edge. Once a man appears in the scene, there's no enough time for NVR or IP camera to detect. We highly recommended customer set detection rule in the center of the scene, or not near the scene's edge.



(8) Rule position

Although the DeepinMind NVR is able to filter false alarms created by leaves, animals etc, it is highly recommended to set rule in a static field/ object. One customer set the line crossing rule on grass in scene below, grass continuously makes false alarms which occupy NVR smart resource and storage space.

(9) IP camera selection

If customer wants to use smart detection in an indoor environment, IP camera with WDR and wide FOV is recommended.

In some outdoor scenarios, bullet cameras are a better choice than dome cameras. Some raindrops might be stuck to the surface of dome camera, with raindrops accumulated, it decreases accuracy of smart detection.

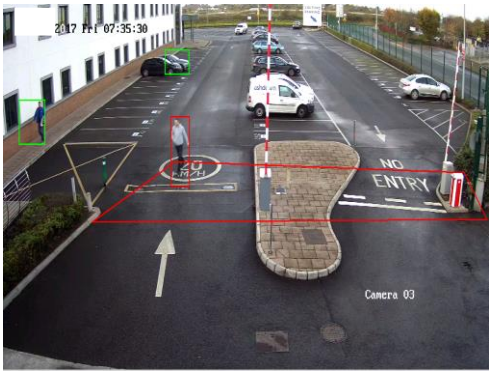
Recommended IP camera models

IP camera	indoor	outdoor
5/7 series	DS-2CD51x6G0-IZS DS-2CD71x6G0-IZS	DS-2CD55x6G0-IZHS DS-2CD5Ax5G0-IZ(H)S DS-2CD75x6G0-IZHS DS-2CD7Ax5G0-IZ(H)S

Bulletin points

- **NVR can analyze up to 16-ch 1080P IP cameras (8-ch 4MP, 4-ch 8MP).**
- Enable **Smart Analysis** option only support 1 line crossing, 1 intrusion detection; streaming requires standard H.264/H.265, H.264+/H/265+/others are not supported in this mode.
- The channel with **Smart Analysis** disabled doesn't support false alarm reduction function.
- The detection region need to be within the near side of the scene, zone setup on the opposite side of the scene should be avoided.
- Cameras aimed towards the sun or bright lighting should be avoided.
- Cameras should be kept clean and in focus to prevent false alarms.

Good Examples



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