



**How to setup an accurate perimeter guarding system  
with DeepinMind NVR**

**HIKVISION TECHNICAL SUPPORT TEAM**

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## How to setup an accurate perimeter guarding system with DeepinMind NVR

This quick guide shows you how to set up an accurate perimeter guarding system with iDS-9632NXI-I8/16S.

All operations in the quick guide are based on GUI 4.0, V4.1.02.

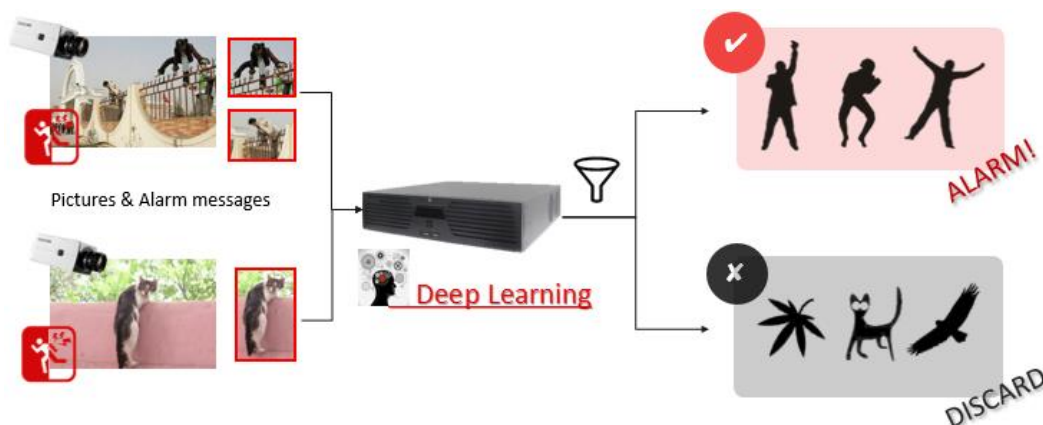
### 1. Basic introduction

In traditional surveillance system, all moving objects trigger perimeter guarding alarm, a large amount of false alarms need to be eliminated essentially.

iDS-9632NXI-I8/16S is Hikvision's new AI NVR, with Hikvision deep learning algorithm, it can filter false alarms triggered by irrelevant targets, such as animals, leaves, to increase detection accuracy considerably.

iDS-9632NXI-I8/16S support filtering false alarm for 4 events: line crossing, intrusion detection, region entrance, region exiting.

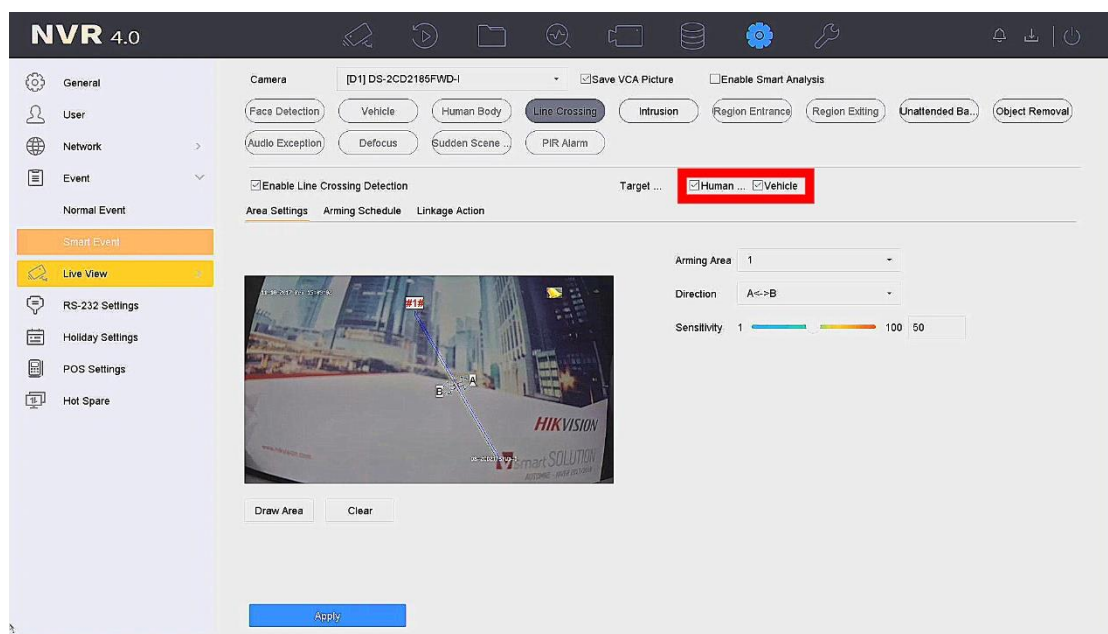
Note: The aim of the system is reducing the false alarm rate, and up to 90% of the false alarm can be filtered.



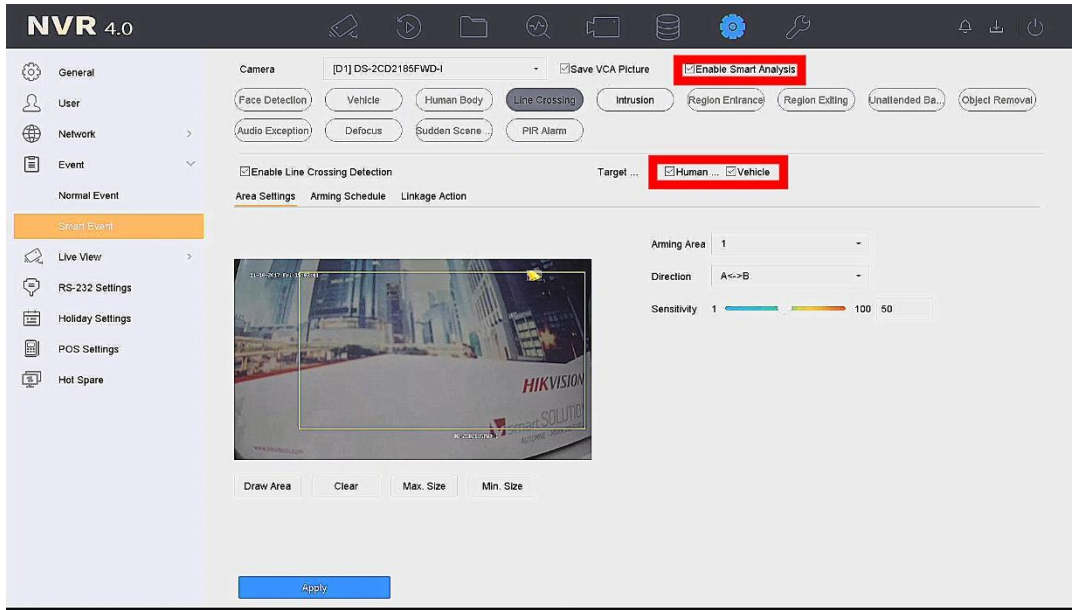
## 2. Operation

### (1) False alarm filter

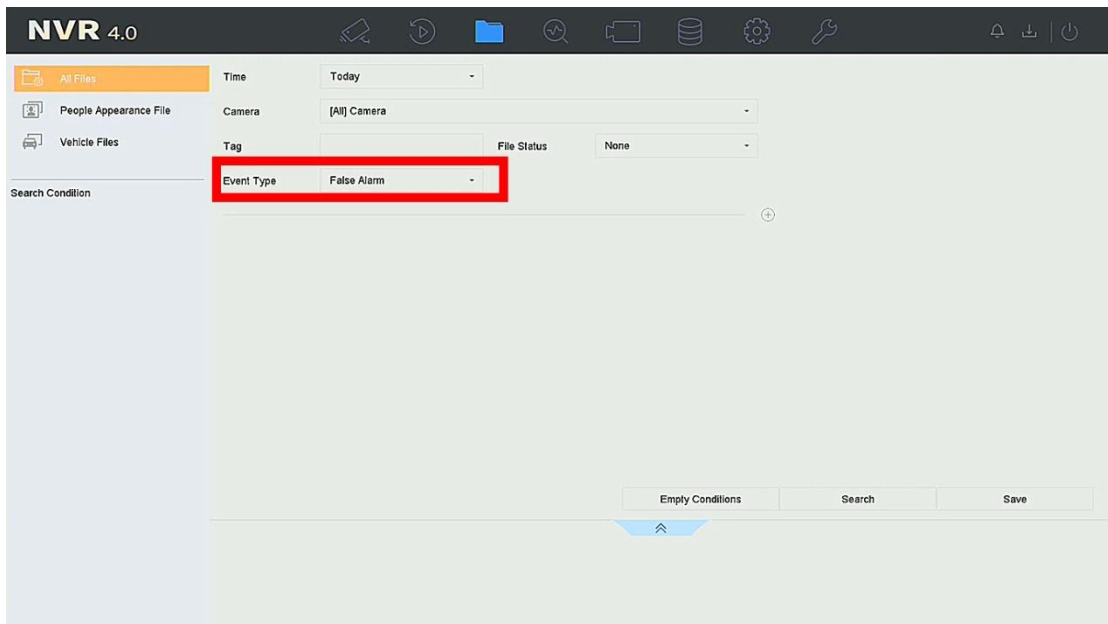
Go to NVR's local GUI, **System—Event—Smart Event**, choose and enable the event you want to detect, then check target of interest. You can choose between 3 modes: **Human**, **Vehicle** or **Human& Vehicle**. Once you enable the option(s), it will based on the algorithm to filter most of the false alarm.



If you tick '**Enable Smart Analysis**', NVR will detect event with NVR algorithm and no IP camera smart detection needed. Thus NVR is able to detect smart event even if IP camera doesn't support. This mode has a higher accuracy and is recommended when there's massive false alarms from IP cameras. Please notice NVR only support 1x Line crossing and 1x Intrusion Detection in this mode at present. In addition, IP camera's video stream should be **standard H264 or H265**, resolution should be lower than or equal to 8MP. In addition, the resolution of camera must be between 2MP to 8MP.

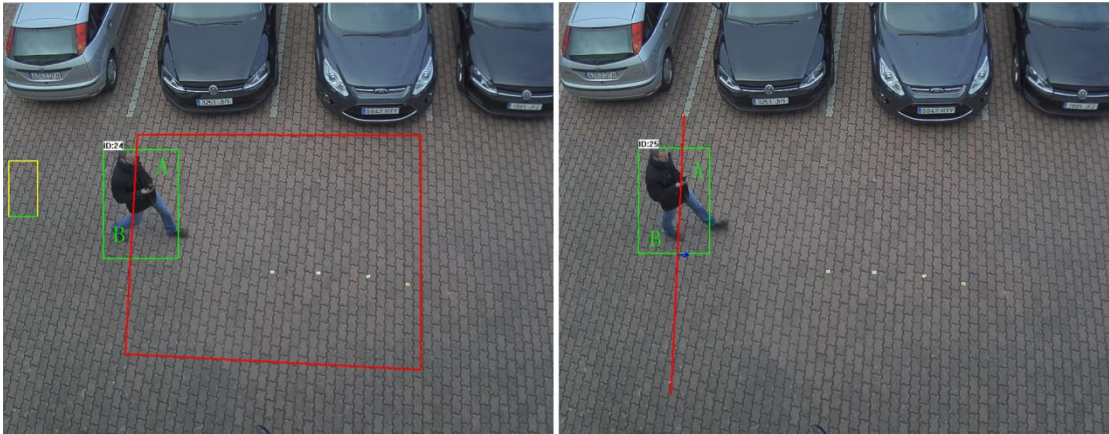


After alarm is filtered, NVR normal playback and file management can only search right alarms, if you want to search false alarms, please go to 'File Management—Event Type—False Alarm' and find out.



Note:

- 1) **Sensitivity:** Related to the proportion of the target across the line and the target itself, which can trigger the alarm. The higher the sensitivity, the more easily the alarm is triggered. The interpretation figure is as follow:



A: the area into the detection area;

B: the area outside the detection area;

S: the sensitivity

When  $A/(A+B) > (100-S)\%$ , the alarm will be triggered. For example, if the sensitivity is set to 100, once the target touch the line, the alarm will be triggered. If the sensitivity is set to 80, only when 20% of the target crossing the line, the alarm will be triggered. The default sensitivity is 50.

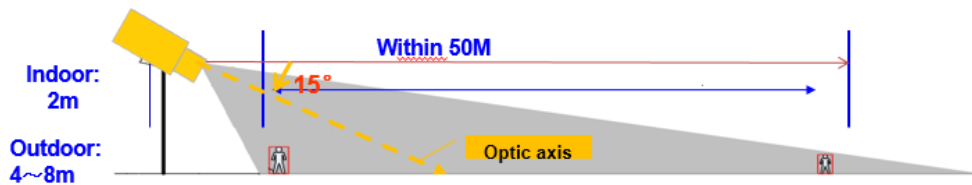
- 2) **Time threshold:** The time during the target reaching the sensitivity. For example, if the time threshold is set to 3, only when the target reaching the sensitivity last 3 seconds, the alarm will be triggered. The default time threshold is 0. (Line crossing do not have such parameter).
- 3) Due to the limitation of decoding capability, do not connect many third-party IPCs which don't have sub-stream for false alarm filtering.
- 4) If you tick '**Enable Smart Analysis**', the NVR can support up to 16-ch 1080P IP cameras(8-ch 4MP or 4-ch 8MP IP cameras).
- 5) **Enable Smart Analysis** option only support 1 line crossing, 1 intrusion detection; and streaming requires standard H.264/H.265, H.264+/H.265+/others are not supported in this mode.

### 3. Installation specification 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 in doors. If it is installed outside, it should be 3-8m high. If there is fence, the installation height must be higher than the fence.

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.

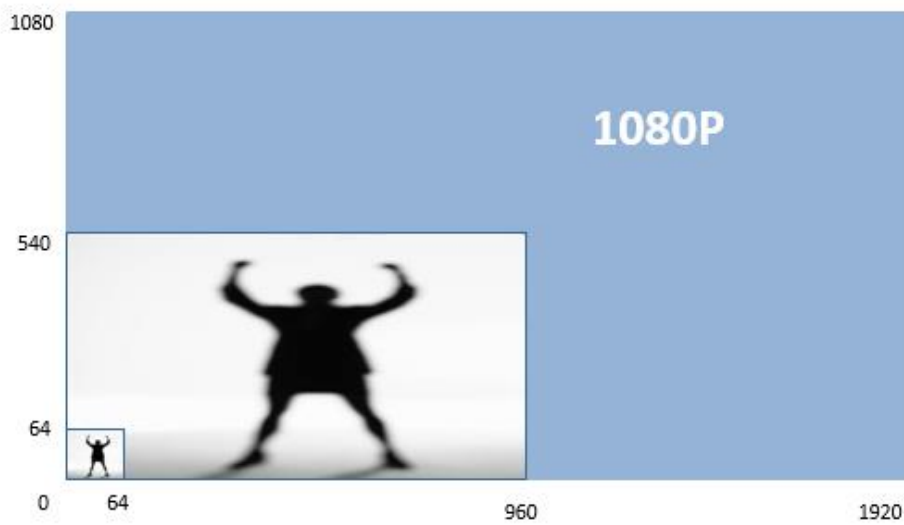
Angle between the optic axis and the horizontal line should be larger than 15°.

## (2) Rule size

The detection area should be larger than 1/4 of the image, which means the vertical rule line should longer than 1/4 of the image vertical size while the horizontal rule line should longer than 1/4 of the image horizontal size.

## (3) Target size

DeepinMind NVR can analyze 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 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 detecting from a longer distance.



#### (4) Influence factors

##### 1) Illumination

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



## 2) Obstacle

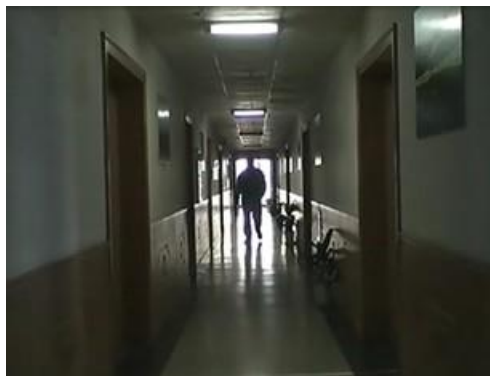
If there're obstacles in front of the camera, there will be c false alarms which occupy NVR smart resources. In addition, large obstacle might block target you are really interested in. Scene in picture below is not an appropriate one for detecting.



## 3) 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.

#### 4) 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.

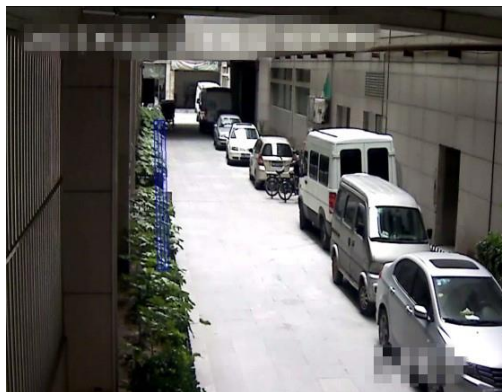
The scene below has too many people and create a vast number of alarms, it's not a recommended scene for detection.



#### 5) 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.



## 6) Rule position

Although 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 line crossing rule on grass in scene below, grass continuously makes false alarms which occupy NVR smart resource and storage space.



## 7) Focal length

If the focal length is too small, the target will be too small to detect as shown in the following figure, which may cause the missed detection. So we need to select the proper focal length to avoid missed detection according to the scene.



## (5) Standard scenario

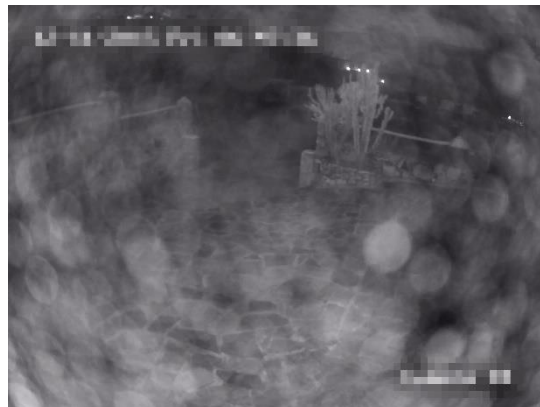




## (6) IP camera selection

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



Here're several modes we recommend for outdoor/indoor use, customer can also select by themselves according to actual scenario.

IP camera	indoor	outdoor
2 series	DS-2CD21x5 series DS-2CD23x5 series	DS-2CD2Tx5 series DS-2CD26x5 series

4 series	DS-2CD4Cx6 series DS-2CD4Dx6 series	DS-2CD4Bx6 series DS-2CD4Dx6 series
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