



# Deepath2 Reference Guide

Deepath2 library version – version 2.1.0

# cieffe

## Detail alarm

Checks video level of details and activate alarm when the level of details falls. Useful to detect when somebody obstruct the camera or in case of darkness.

### Alarm attributes

Name	Type	Description
Aux Alarm	True or False [False]	Can raise an aux alarm

### Zones attributes

Name	Type	Description
Detail loss	Percent [20%]	Percentage of detail that the scene has to loss to active the alarm.
Detail threshold	Unsigned integer [0]	Under this absolute level of detail the alarm is activated.
Time period	Time in milliseconds [1000 ms]	Maximum period of time in witch the detail loss percentage must be reached.

## Face alarm

This alarm detects frontal faces in the whole scene. The results associate a confidence level to each detected face and the user can select the appropriate threshold value for this parameter to filter out unwanted alarms. The detected faces are highlighted with a square region that covers the face eyebrows to chin.

### Alarm attributes

Name	Type	Description
Confidence	Percentage [50%]	Minimum confidence level that triggers the alarm
Fps	Unsigned [2]	Frames per second that the face detector analyze
Max Size	Screenbox	Maximum face size (ideally square shape, eyebrows to chin)
Min Size	Screenbox	Minimum face size (ideally square shape, eyebrows to chin)

## Fall alarm

This alarm tracks people and check for a "slip & fall" event. No zones are allowed, the alarm is based on the tracking. Though the "Tracking alarm" is not necessary, a "Perspective" should be added for the "Fall alarm" to work.

### Alarm attributes

Name	Type	Description
Human Only	True or False [True]	Track exclusively paths that are detected as human activity, filtering out uncertain paths (and vehicles).

## Flow alarm

Counts the number of objects that moves through a given zone (destination) coming from another zone (source). At least two zones have to be configured: the source zone and the destination zone. The attribute "source zone" of the destination zone is to be set in order to count objects.

### Alarm attributes

Name	Type	Description
Aux Alarm	True or False [False]	Can raise an aux alarm

### Zones attributes

Name	Type	Description
Flow threshold	Unsigned integer [0]	Number of objects to trigger the alarm in a given time (Time period)
Source (zone)	Zone [none]	Zone from which the object will come in order to trigger the alarm
Time Period (s)	Time in seconds [0 s]	Time window in which deepath2 counts objects

## Global motion alarm

Deepath2 detects if all the scene is moving in the same direction and is capable to understand if the camera is moving, and in witch direction has been moved.

### Alarm attributes

Name	Type	Description
Aux Alarm	True or False [False]	Can raise an aux alarm

## Motion alarm

Deepath2 detects moving objects, classifying for direction, size and speed. If it detects a moving object with some characteristics it activates the motion alarm. Motion alarm may also be used from CIEFFE DVMS servers to determinate if the scene should be recorded.

### Alarm attributes

Name	Type	Description
Global Sensitivity	Percentage [92 %]	Sensitivity of the motion detection algorithm.
View Mode	Type index (0, 1, 2) [1]	Set how to evidence moving objects 0: outline drawings 1: surrounding ellipses 2: surrounding boxes
Aux Alarm	True or False [False]	Can raise an aux alarm

### Zones attributes

Name	Type	Description
Max size	Width and height [undefined]	Maximum width and height of the objects.
Min size	Width and height [0%, 0% - 8%, 8%]	Minimum width and height of the objects.
Sensitivity	Percent [92%]	Sensitivity of the motion detection algorithm.

## Panic alarm

Detects panic situations where many objects are moving in many directions at the same time.

## Alarm attributes

Name	Type	Description
Aux Alarm	True or False [False]	Can raise an aux alarm

## Zones attributes

Name	Type	Description
Distance bore	Lengths units calibration	Allow to calibrate the lengths. Is needed to calculate real world speed from seen images. To insert a correct calibration click on the tool button available below the attribute name and draw an arrow on the screen. Then insert in the dialogue box that appears how which is the length of the arrow in the real world.
Motion threshold	Percentage [50 %]	The first condition is verified if at least "motion threshold" percentage of zone is moving.
Speed threshold	Speed in km/h or mph [6 km/h]	The second condition is verified if at least "motion threshold" percentage of zone is moving at least at this average speed threshold.
Time period	Time in seconds [2 s]	Both the conditions are considered verified only after this time period, before active the alarm.

## Permanency alarm

Alarm useful to detect situation in witch one object is left in the scene for at least a given log time. Examples of detectable situations:

- one terrorist leaves a camouflaged bomb in a public area;
- someone puts an obstacle at an cars exit;
- etc.

## Alarm attributes

Name	Type	Description
Min confidence	Percentage [80 %]	When other objects pass in front of the object and partly occlude it, the confidence is lower.
Permanency time	Time period [20 s]	Time period after witch the alarm can be activated.
Tracking link	True or false [false]	If true raises an alarm only if "time period" seconds before a tracking path was found in the object area.

Name	Type	Description
Aux Alarm	True or False [False]	Can raise an aux alarm
Use Perspective	True or False [False]	The alarm uses/doesn't use the perspective alarm in analysis

### Zones attributes

Name	Type	Description
Maximum size	Width and height [0%, 0% - 100%, 100%]	Maximum object size
Minimum size	Width and height [0%, 0% - 6%, 6%]	Minimum object size
Real Max Width	Width in cm (or inch)	Maximum object width in cm (or inch)
Real Max Height	Height in cm (or inch)	Maximum object height in cm (or inch)
Real Min Width	Width in cm (or inch)	Minimum object width in cm (or inch)
Real Min Height	Height in cm (or inch)	Minimum object height in cm (or inch)

## Perspective alarm

This alarm allows the user to specifies the perspective of the scene.

### Alarm attributes

Name	Type	Description
Focal Length (mm)	Unsigned [50mm]	The attribute represents the 35mm equivalent focal length of the camera, used to evaluate the distance of objects in the scene: when a new bore is being defined, the approximate distance is shown below the bore number.

### Zone attributes

Name	Type	Description
Anchor (Horizontal)	-1, 0, +1 [0]	Specify the horizontal anchor of the object bounding box.
Anchor (Vertical)	-1, 0, +1 [0]	Specify the vertical anchor of the object bounding box.
Bore1, Bore2, Bore3, Bore4,	Width and height [0%, 0% - 100%, 100%]	Set the size of an object with the specified dimensions in one point of the scene

Name	Type	Description
Bore5, Bore6		
Depth Grid	True or False [True]	Show a wireframe plane that represents the perspective of the zone
Object Width	Unsigned Integer [72]	The width of the object used to specify the perspective of the zone
Object Height	Unsigned Integer [72]	The height of the object used to specify the perspective of the zone

## Queue alarm

Deepath2 detects temporary steady objects in the zone (for instance car queues).

### Zones attributes

Name	Type	Description
Area threshold	Percentage [50 %]	Minimum zone area covered by steady objects.
Trigger threshold	Time in seconds [1 s]	Minimum time period before active the alarm.
Aux Alarm	True or False [False]	Can raise an aux alarm

## Setup

Configure general parameters useful to tune senses to the behaviour of specific cameras.

### Setup attributes

Name	Type	Description
Chroma Denoise	Integer (0-255) [50]	How much Deepath2 have to ignore chroma noises
Luma Denoise	Integer (0-255) [20]	How much Deepath2 have to ignore luminance noises
Min Size	Box (width & height) [0]	By means of this parameter it is possible to filter out small objects and noise, defining the minimum allowed dimension. If the box is defined inside a "Perspective" zone, the dimensions will be scaled with the

Name	Type	Description
		distance.
Scene Cut Percent	Percentage [70 %]	Percentage of screen area involved in changes in order to detect a scene change
Threshold	Integer (0-255) [-1]	Diversity from background to unveil an object (-1 : automatic)
Luma Sensitivity	Integer (0-255) [255]	The weight of the luma component of the signal used in the analysis
Chroma Sensitivity	Integer (0-255) [64]	The weight of the chroma component of the signal used in the analysis
Temp Min Intensity	Integer (0-255) [0]	This parameter and the following "Max Intensity" define the range of grayscale luminosity that must be selected as object. This feature should be used in conjunction with a fixed gain thermal camera.
Temp Max Intensity	Integer (0-255) [0]	This parameter and the previous "Min Intensity" define the range of grayscale luminosity that must be selected as object. This feature should be used in conjunction with a fixed gain thermal camera.
Temp Background	True or False [True]	When one of the previous "Temp Intensity" parameters are set, this parameter can be used to filter out the objects in the background that are in the selected grayscale range (when true) or to keep such objects (when false)
Update Frequency	Percentage (0%-100%) [100 %]	This percentage specifies the amount of frames that Deepath 2 uses to compute the results. With high values (100%) the results will be more accurate and the load of the DSP will raise, with low values (40% or less) the results will be inaccurate but the DSP will have more computing power available. Setting the value to 0% excludes Deepath 2.

## Speed alarm

Deepath2 can measure the speed of moving objects, and can send alarms if objects exceed a speed limit.

### Alarm attributes

Name	Type	Description
Aux Alarm	True or False [False]	Can raise an aux alarm

## Zones attributes

Name	Type	Description
Distance bore1, Distance bore2, Distance bore3	Length units calibration	Allow to calibrate the lengths. Is needed to calculate real world speed from seen images. To insert a correct calibration click on the tool button available below the attribute name and draw an arrow on the screen. Then insert in the dialogue box that appears how which is the length of the arrow in the real world. Deepath2 use the calibration closer to every moving object. 3 calibration is available for every zone.
Speed limit	Speed in km/h or mph [50 Km/h]	If an object exceeds this limit, then the alarm is activated.
Trigger threshold	Time in milliseconds [200 ms]	The alarm is activated only if the speed limit is exceeded for at least this time.
Use Perspective	True or False [False]	The alarm uses/doesn't use the perspective alarm in analysis

## Tracking alarm

Deepath2 tracks objects movements and records in a internal real time database. It can use this database for better understand what is happening, or just for detect if an object has moved from a source zone to a destination one. In that case it activates the tracking alarm.

## Alarm attributes

Name	Type	Description
Min Distance	Integer [16]	A path must run for "min distance" length before it is considered as valid
Min Life (ms)	Time in milliseconds [800 ms]	A path must run for "min life" time before it is considered as valid
Show Trace	True or False [True]	Show traces behind objects
View Distance	Integer [48 ms]	Maximum length of trail to be shown
View Time (ms)	Time in milliseconds [2000 ms]	Maximum time length of the path to be drawn
Human/Vehicle	True or False [True]	Enable/Disable acknowledgment of human and vehicle in the scene
Aux Alarm	True or False [False]	Can raise an aux alarm

## Zones attributes

Name	Type	Description
Maximum time	Time in milliseconds [0 ms]	Maximum time required for go from source zone to this zone.
Minimum time	Time in milliseconds [0]	Minimum time required for go from source

Name	Type	Description
	ms]	zone to this zone.
Source	Zone [none]	If the zone from which the object came from is the selected area, Deepath2 activates the alarm.
Trigger	True or false [False]	Every trace in the area activates the alarm
Alarm On Human	True or False [True]	If "Human/Vehicle" attribute is set to "True", then a path, which is catalogued as "Human", can raise alarms
Alarm On Vehicle	True or False [True]	If "Human/Vehicle" attribute is set to "True", then a path, which is catalogued as "Vehicle", can raise alarms

## Wrong way alarm

Deepath2 activates this alarm if an object is moving in zone in the wrong direction.

### Alarm attributes

Name	Type	Description
Aux Alarm	True or False [False]	Can raise an aux alarm

### Zone attributes

Name	Type	Description
Direction	Direction vector [0%, 0% - 100%, 0%]	Set the correct direction that all objects must keep. Otherwise they activate the alarm.
Tolerance	Angle in degrees [39 °]	Direction Tolerance to avoid false alarms.
Trigger threshold	Time in milliseconds [1000 ms]	Minimum time period the wrong direction has to be kept before activating the alarm.