How to configure PPE Detection in FireFly 3.1

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Content

1. Objective:

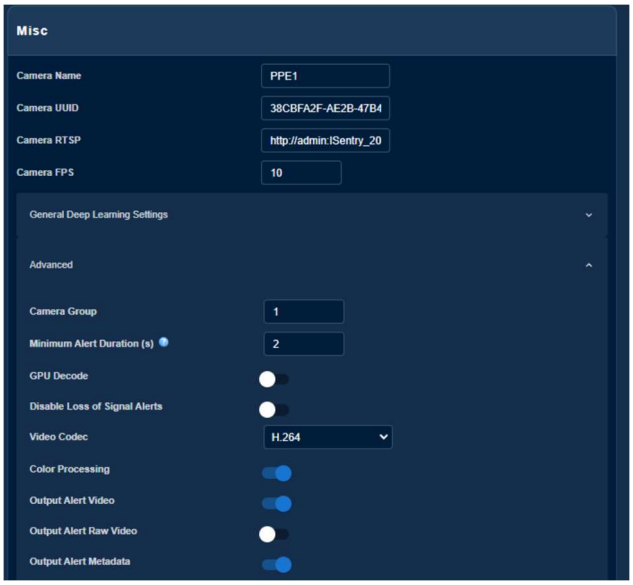
The purpose of this document is to guide our customers and users in how to configure Firefly product to detect PPE equipment using our video analytic solution.

2. Track Changes:

Date	Author	Description	Release
06/11/2024	PMC	All chapters changed	Draft

3. Prerequisites:

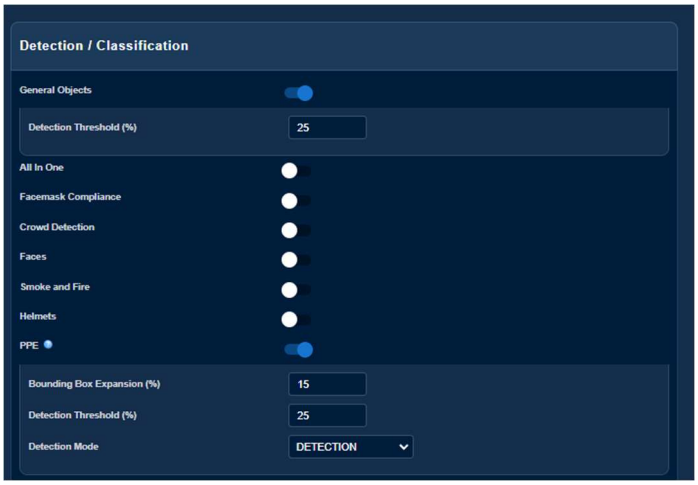
- Latest version of FireFly 3.XX installed, licensed and up to date.
- RTSP video feed of the intended camera successfully added.
- Understanding: In the UI a Blue button means the feature is enabled.
- Understanding: In the UI a White button means the feature is disable.
- Under the Option "General Deep Learning Settings" please ensure "Output Alert Video" and "Output Alert Metadata" ae enable as per the image below:



4. Detection / Classification

Under: http://192.168.1.143:8123/settings

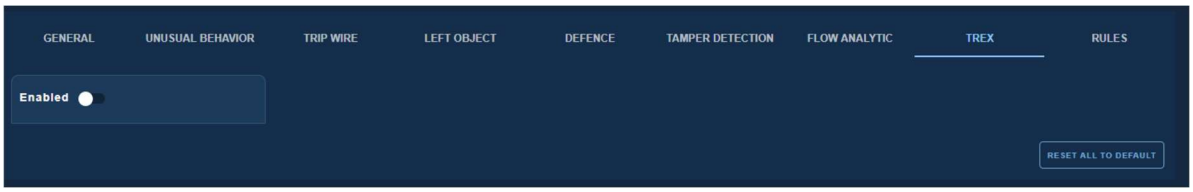
- Please log in with your credentials
- Select the camera you wish to configure from the list on the left.
- Under the Detection and Classification options on the right-hand side please enable "General Objects and PPE as per the image below:



- Please select if you wish to only detect PPE equipment or wish to ensure compliance. Compliance will look for several pre-selected mandatory items and alert if one of them is missing.

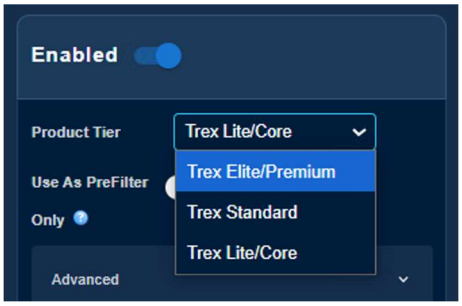
5. Video Analytics Configuration steps:

- Please Select your camera
- Please select "TREX"
- Please select "Enable".



6. Product Tier:

Once this video analytic engine is enabled now you can choose the Tier of the product you wish to use. Please note the Tier of product here is the same as the Tier of Software License you have purchased.



- TREX Lite/Core:

Select this option if you have purchased a TREX Lite or TREX Core software license.

- TREX Elite/Premium:

Select this option if you have purchased a TREX Elite or TREX Premium software license.

When selecting this option, you now have the capability to choose where do you wish the processing of this video analytic to occur.

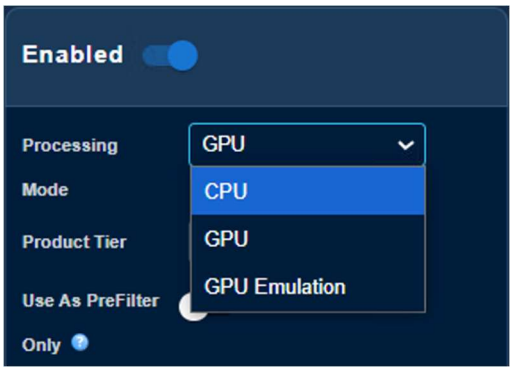
This can be on your CPU (Central Processing Unit), or GPU (Graphics Processing Unit), GPU emulation.

Please only enable these options according to your hardware capability, availability and configuration. If you are not sure, please leave the selection on CPU or contact our support team for more information.

- TREX Standard:

Select this option if you have purchased a TREX Standard software license.

When selecting this product tier option, you also have the capability to choose where do you wish the processing of this video analytic to occur.



This can be on your CPU (Central Processing Unit), or GPU (Graphics Processing Unit), GPU emulation.

Please only enable these options according to your hardware availability and configuration. If you are not sure, please leave it on CPU or contact our support team for more information.

Once the "TREX" Option is enable please select your Product Tier:

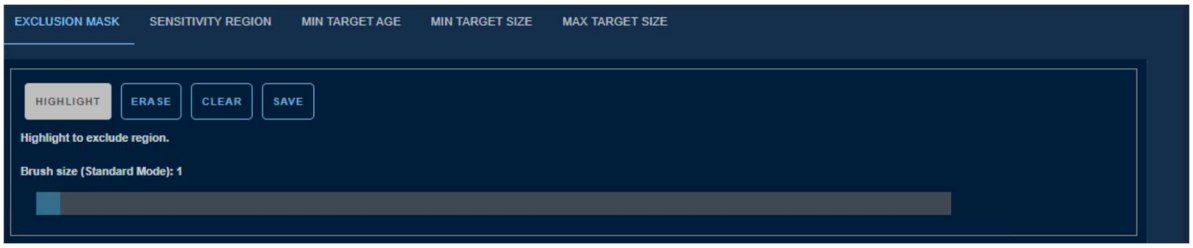
Under the "Time Schedule" please select the adequate time schedule to apply this video analytic detection.

The detection mode in this use case is" "Object Tracking" as per the settings on the image provided.

Please select your preferred time schedule from the drop-down list and select "APPLY".

7. Exclusion Mask:

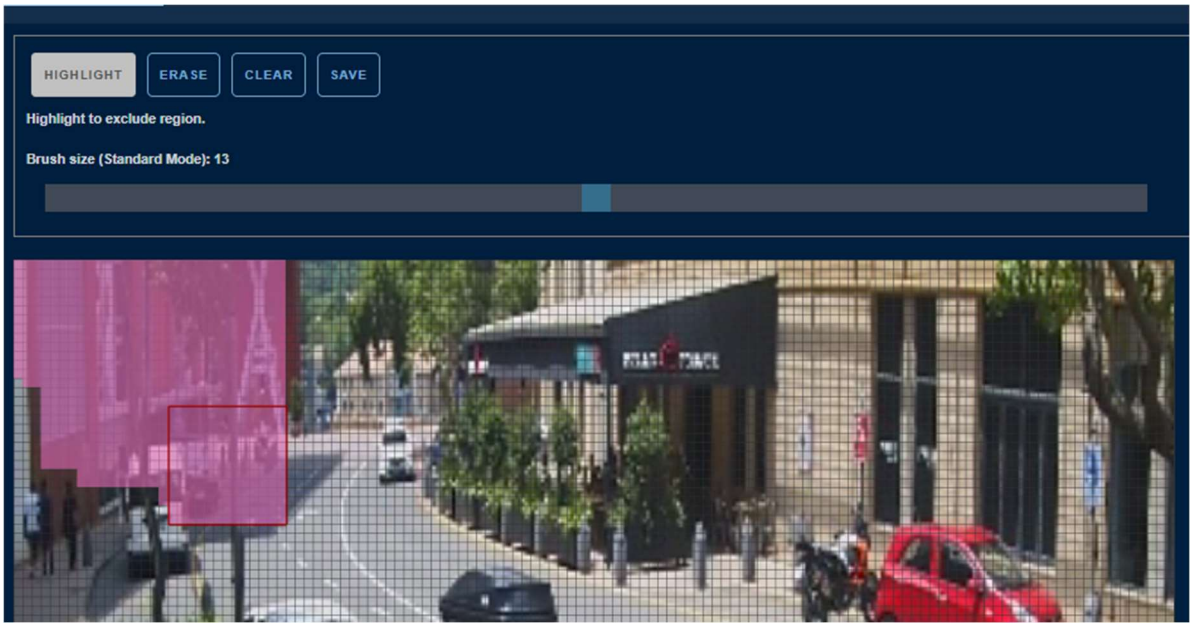
In this area, using the Brush Size, please select any area of the FOV you wish to exclude.



This could be a private area you do not wish to detect and track.

Please find an example of an Area of exclusion, drawn with a medium size Brush. Once the desired area correctly identified and highlighted. Options to "ERASE", and "CLEAR" are available.

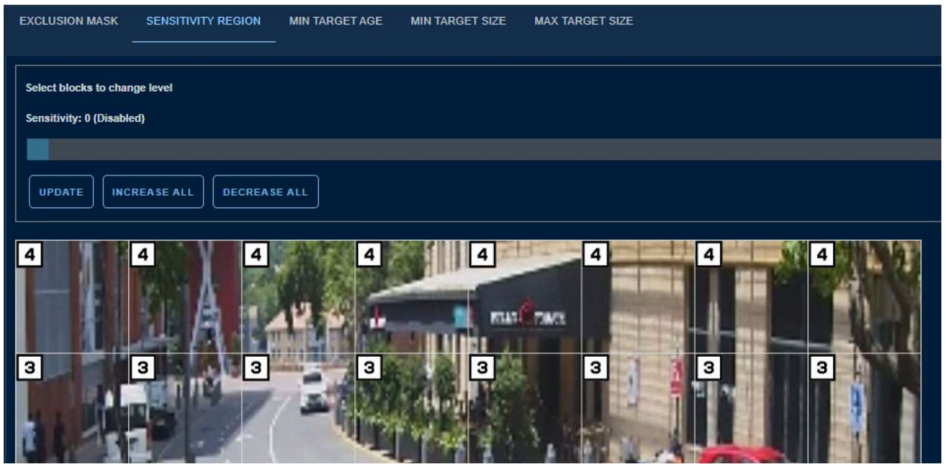
- Once the desired Exclusion area is highlighted in pink Please press "SAVE".



8. Sensitivity Region:

The Sensitivity values range from "0" (Zero is off) to 6 the lower is the lowest sensitivity to the highest sensitivity being 6. Please adjust these values according to your scene.

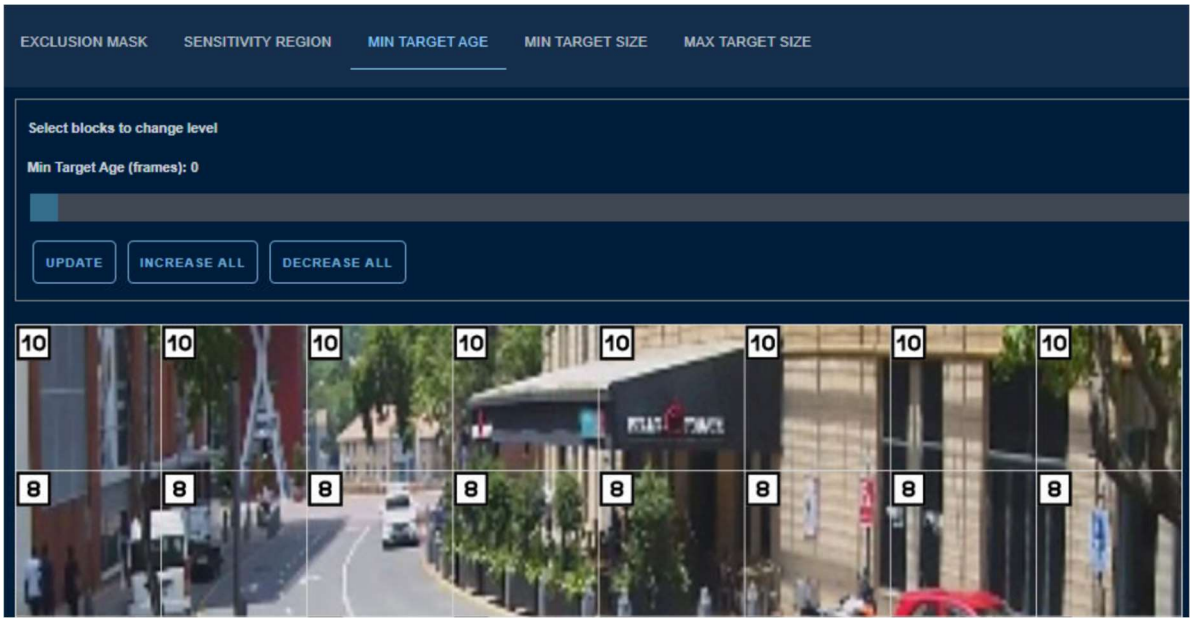
- Using the mouse please select the video block you wish to change the level of Sensitivity. Alternatively, you can use the "Increase All" and "Decrease All" options provided on the user interface as per the image below.



9. Min Target Age:

The Min (minimum) Target Age values range from "0" (Zero is off) to 9 the lower value is the lowest Target Age to the highest Target Age. Please adjust these values according to your scene.

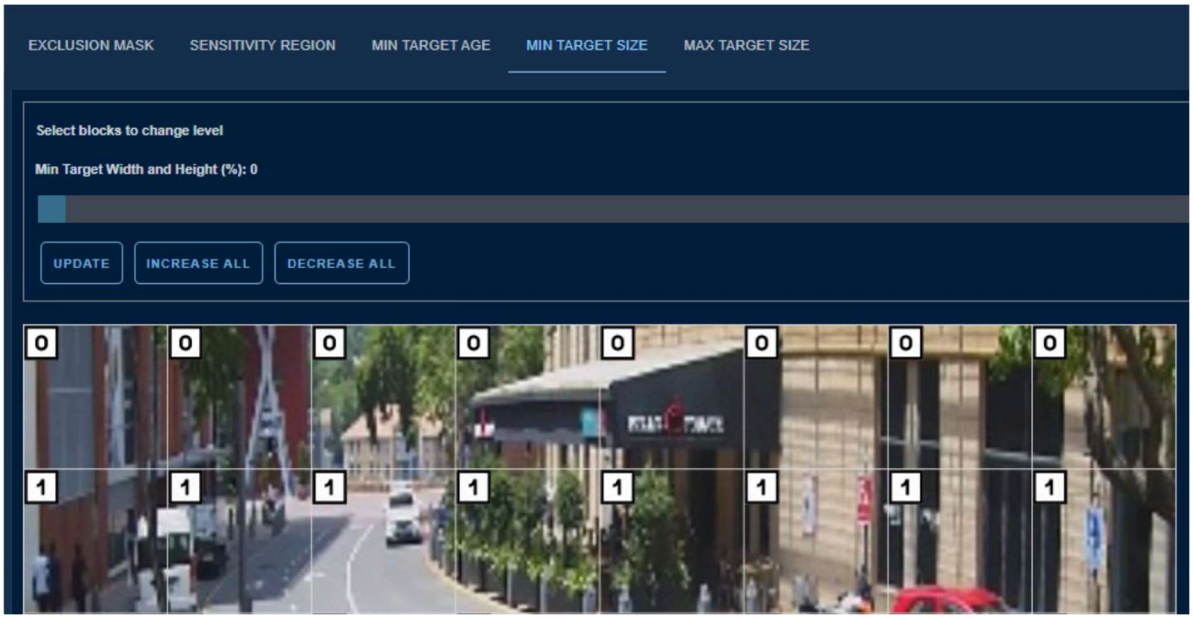
- Using the mouse please select the video block you wish to change the Min Target Age. Alternatively, you can use the "Increase All" and "Decrease All" options provided on the user interface as per the image below.



10. Min Target Size:

The Min (minimum) Target Size values range from "0" (Zero is off) to 100% the lower % value is the smallest Target Size to the largest Target Size as per Width and Height. Please adjust these values according to your scene.

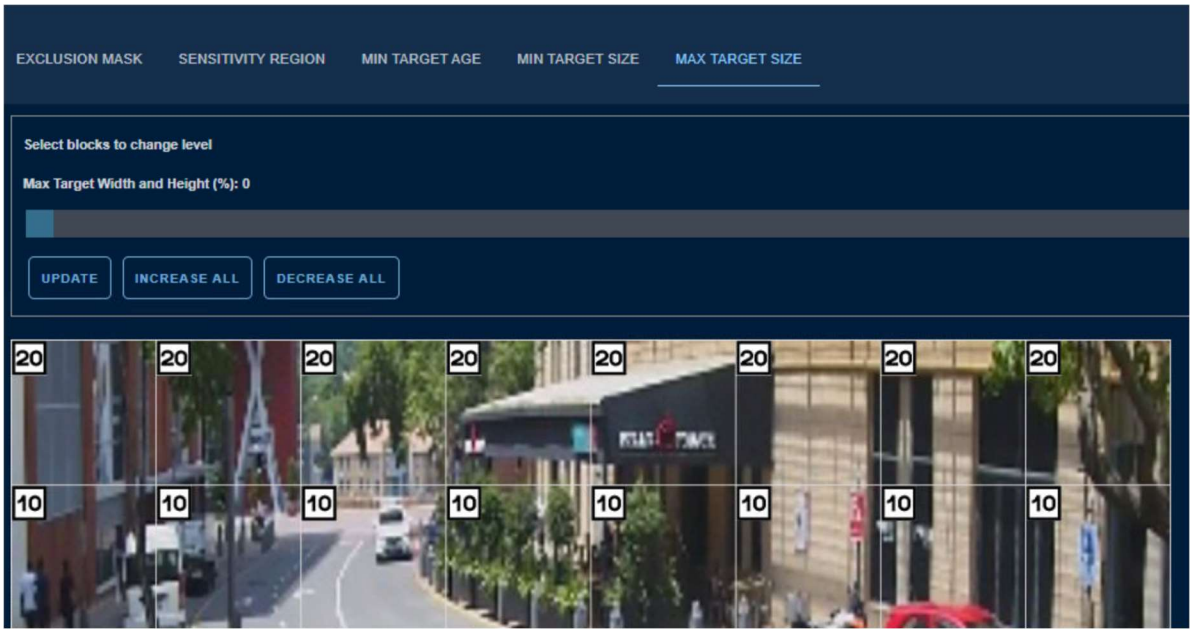
- Using the mouse please select the video block you wish to change the Min Target Size. Alternatively, you can use the "Increase All" and "Decrease All" options provided on the user interface as per the image below.



11. Max Target Size:

The Max (maximum) Target Size values range from "0" (Zero is off) to 100% the lower % number the lower value is the smallest Target Size to the highest being the Maximum Target Size as per width and height. Please adjust these values according to your scene.

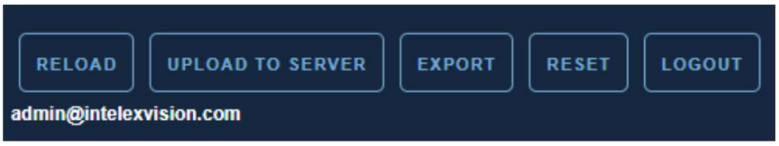
- Using the mouse please select the video block you wish to change the Min Target Age. Alternatively, you can use the "Increase All" and "Decrease All" options provided on the user interface as per the image below.



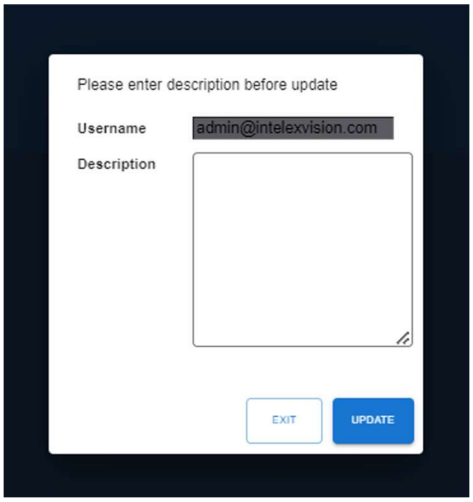
12. Saving Changes:

Once you have achieved the desired detection and tracking configuration, it is important to save these changes and applying them to the video analytic engine.

- Please select the option "UPLOAD TO SERVER" from the top right hand side menu as per the image provided below:



Once the option to upload is triggered, a new window will prompt more details.



- Please select the option "update" to apply the new configuration changes to the FireFly server.

Please allow for the timer to finish before reloading the screen.

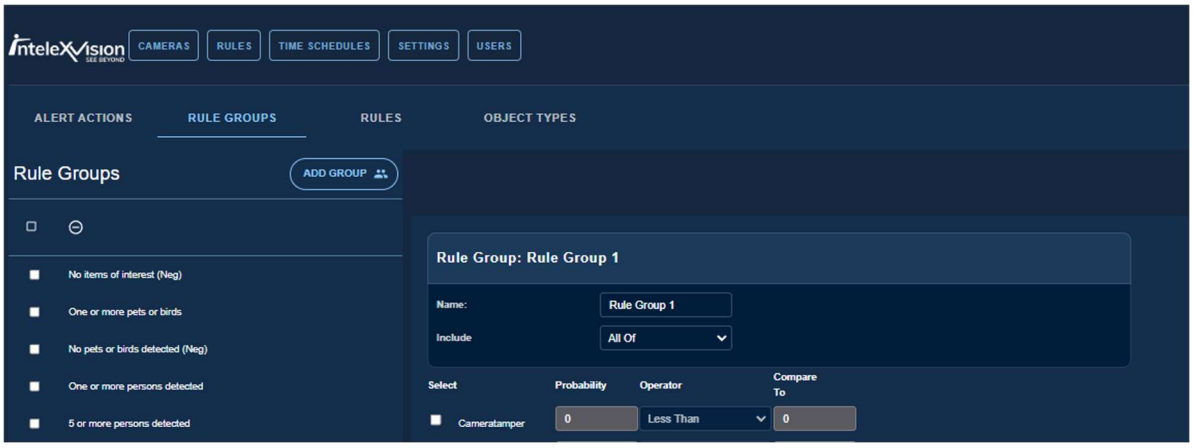
Once this process has been completed, you can now continue to another page or option.

- Please re-enter your credentials and select "LOGIN".

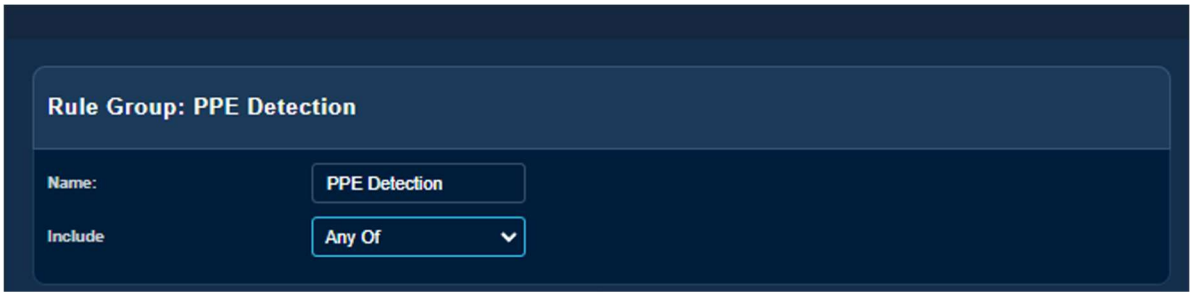
13. Create a New Rule Group:

In the Rule Group, you are now able to choose what items, objects or actions will trigger you new Rule Group.

- From the top left menu, select "RULES" and on the tab below please select "RULE GROUPS"
- Please select Add Group
- Please enter a name for your new rule group.



For the purpose of this guide, we are calling it "PPE Detection".

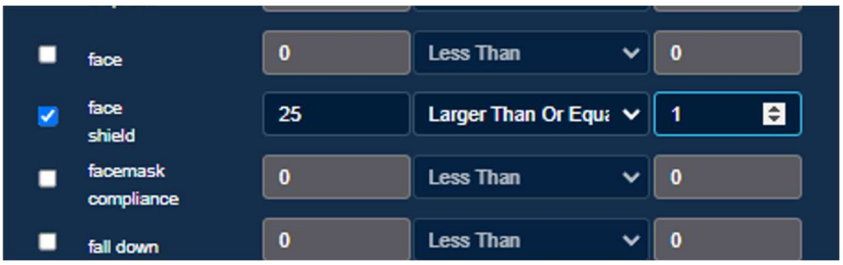


Now we can choose what we wish to include in the trigger:

All Of: The trigger will activate when "All Of" the PPE items selected in the list are detected in the scene. A face shield, a hight visibility vest and a hard hat. When the 3 items are simultaneously classified in the scene it will activate your new rule.

Any Of: The trigger will activate when "Any Of" the PPE equipment selected in the list are detected in the scene. A face shield, a hight visibility vest or a hard hat. When any of the 3 items are classified in the scene it will activate your new rule.

To select the objects, items, or actions please tick the white box next to it.



Probability: Please enter the percentage of the minimum probability that the system needs to classify before defining it as a Face Shield. As per the example below, any classification less than 25% certainty, it will not be identified as a Face Shield.

Operator: In this drop-down list you can now choose the Boolean expression to use in order to deliver your intended use case:

Less Than:

Less Than or Equal To:

Equal To:

Larger Than or Equal To:

Larger Than:

Compared to: Here you can compare and match the object, item, action quantity with a real number.

For the purpose of this guide and to deliver a PPE detection using TREX we are choosing:

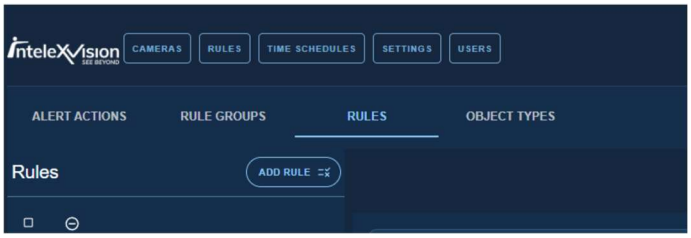
"Larger Than or Equal to": "1"

Once you have selected the necessary objects or actions from the list and configured the parameters as per the example above, you can now save your changes to the server as per chapter 12 Saving Changes.

14. Create a New Rule:

If the rule you wish to apply is not available on the pre-configured list, you can create a new rule.

- On the top left of the menus, please select "RULES" then on the next menu please select "RULES" again followed by "ADD RULE" as per the image provided below:



Once you have selected "ADD RULE" a new rule will be available on the left collum at the bottom of the list of pre-configured rules, displaying as "Rule #" just like the image provided:

The right-hand side screen options will allow you to change the rule name from "Rule 1" to something more appropriate such as "Alert_Type_Object_Name" IE: "PPE Detection"

- After naming your new rule, please select a "rule group" to include.

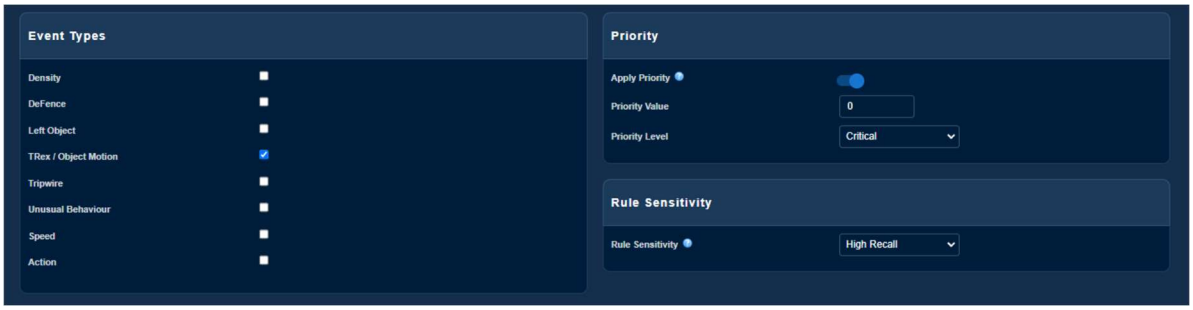
Here you can include multiple groups by selecting the tick box next to it:

Any Off: To include "Any Of" the rule groups available before activating this rule.

All Off: To include "All Of" the rule groups available before activating this rule.

Under the rule groups option available in the user interface, we can now select what video analytic engine will provide the metadata to apply the rule and the rule group.

In this example the metadata and alert information will be provided by our video analytic TREX/Object Motion.



If you wish to apply a priority over other alerts being generated by the same camera, please enter a priority value and choose a priority level from the drop-down list. Please note that if you use a priority level "Actions" will Not Apply.

Alternatively, if you do not wish to apply a priority to your rule you can create an action.

- Please select the action you want to activate when this rule is activated.

Dismiss Environment: Dismiss the alert as Environment noise.

Dismiss Other: Dismiss as another reason.

Dismiss Uninteresting: Dismiss as an uninteresting alert.

Escalate to Alarm: Escalate this alert to Alarm status.

- **Please choose a Category for your rule from the options available on the drop down list.**

Now it is time to configure the Rule Sensitivity, this can be done choosing 1 of 3 options depending in how sensitive you want the rule detection to be:

High Recall: When the PPE item, action etc, is classified in minimum 1 of 3 video Frames.

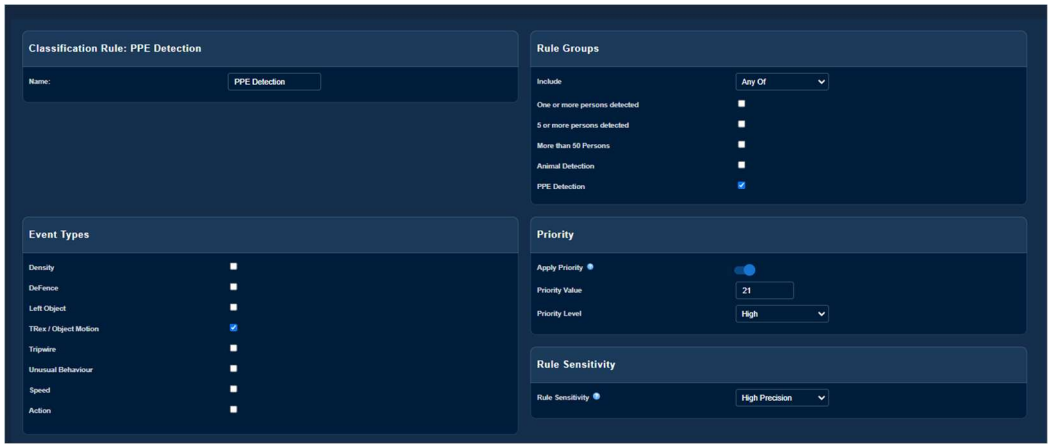
Hight Precision: When the PPE item, action etc, is classified in minimum 3 of 3 video Frames.

Majority: When the PPE item, action etc, is classified in minimum of 50% of the available video Frames. Ideally, we recommend no less than 10 FPS per camera.

For the purpose of this guide, we have chosen to apply High Priority to our PPE detection Rule.

Once your new rule configuration is complete, please upload your new setting to the Firefly Server as per chapter **12 Saving changes:**

Our example:

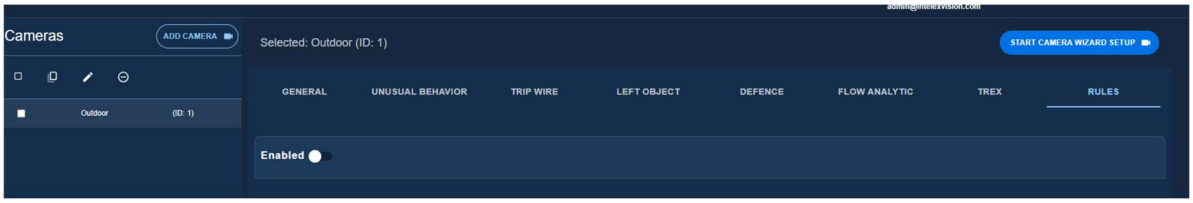


Now with the new Rule Group and the new Rule created you can choose what cameras to apply it to.

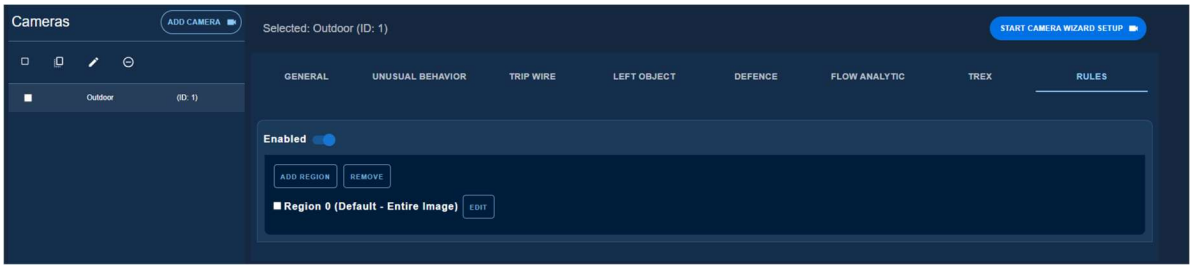
15. Camera Rule Configuration:

In this instance we will configure our video analytic Rules to apply to the camera you have enables and configured TREX.

- Please select "RULES" and select "Enable".

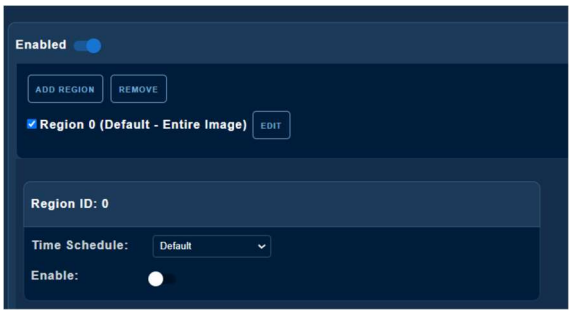


Once it is "Enabled", you can now add a desired region of interest or by selecting "Region 0" it will apply your settings to the entire image as the default option.



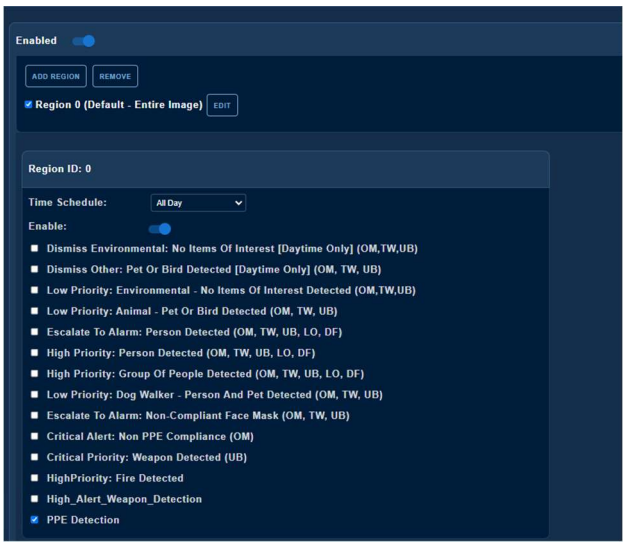
Now with the "Region 0" (entire image) enable, you can select any pre-defined time schedule from the drop down menu.

If you do not have a preferred pre-defined time schedule you can select the "Default".



- Please select the option "Enable" to begin to deliver the remaining Rule configuration.

Now with the Rule engine time schedule enable, you can select a pre-configured template Rule to execute, your new PPE detection rule will be in the list. If not, please make sure you have saved your settings as per chapter 12 saving changes.



Depending on your needs, camera resolution, positioning and filed of view, you can enable one or multiple Rules to execute on this camera.

If you wish to have separate rules for a different region on the FOV, please use the "ADD REGION" option. Or you can erase an existing region of interest.

- Now please select the rule you wish to apply from the list of rules available.

Once "PPE Detection" rule is selected from the list of rules available, please do not forget to upload your new settings to the server. This is described step by step under chapter **12 saving changes.**

Please review your settings and then test the detection sensitivity, distance etc and adjust accordingly. Please remember to "Upload to server" once you have perfected your settings.

If you have any questions or need any further support do not hesitate to reach us under:

CustomerServices@intelexvision.com