IVA Pro PPE with FW 9.40

Whitepaper

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1 Introduction

Many organizations in critical infrastructure, government, and airport environments have strict safety regulations that require employees and visitors to wear specific personal protective equipment (PPE). Companies failing to comply with health and safety protocols set by OSHA may face fines. Intelligent Video Analytics (IVA) Pro PPE (Personal Protective Equipment) is a new application-specific video analytics software designed to detect the proper use of personal protective equipment and promptly alert when missing. The software may enhance safety compliance and operational efficiency, potentially reducing accident risk and promoting health and safety.

2 Features

IVA Pro PPE (Personal Protective Equipment) can reliably detect people analyses them for wearing personal protective equipment. PPE items include

- safety vest
- hard hat

These attributes are added in the metadata stream, integrating them into the rule engine and allowing users to set specific alarms and events using our proprietary Configuration Manager.

IVA Pro PPE is based on IVA Pro Buildings and comes with its full functionality. In addition, a new task “PPE monitoring” is available, which checks for selected PPE items and alarms if they have not been seen at a person for a specified amount of time.

View the PPE items of a selected person via metadata inspection.

IVA Pro PPE is a licensed option.

3 Limitations

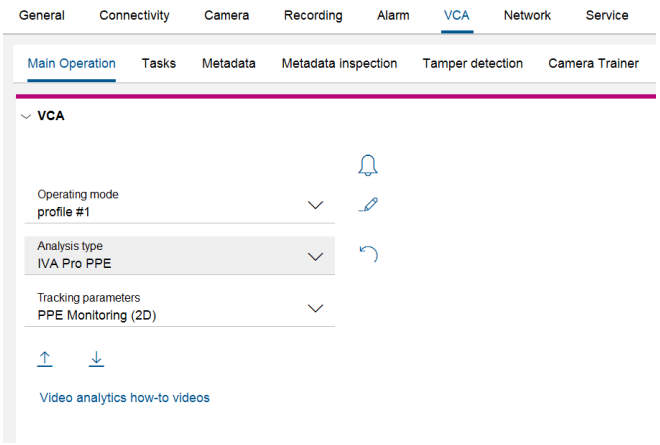
- Available on CPP14 cameras w/o 3000, multi or panoramic cameras.
- Object detection and tracking is running with 7.5 fps instead of the usual 15 fps. PPE attribute extraction is running roughly once every three seconds for each person.
- In the used video analytics resolution of 1280x720 or 1024x576 (8MP cameras), the person must have a height of at least the following pixels to properly detect PPE.
    - Safety vest: 48 pixel person height
    - Hard hat: 96 pixel person height
- PPE items should be clearly visible and presented to the camera
- The persons should be upright and either standing or walking.
- The persons should be clearly visible and not occluded by other persons or items. Ensure that persons walk through the monitored area single file with enough separation for best performance.
- Ensure that a minimal illumination of at least 200 lx is given in the scene.
- Safety vests includes safety jackets. Safety vests and jackets are defined, amongst others, by their reflective strips. Detection will be delayed until a reflective strip becomes visible.
- In case of white hard hats, ensure that no spotlight causes oversaturation of the hard hat in the video, as detection performance will otherwise drop.

4 Configuration

Configuration of IVA Pro PPE requires the Bosch Configuration Manager 7.74 or higher.

4.1 Activating IVA Pro PPE

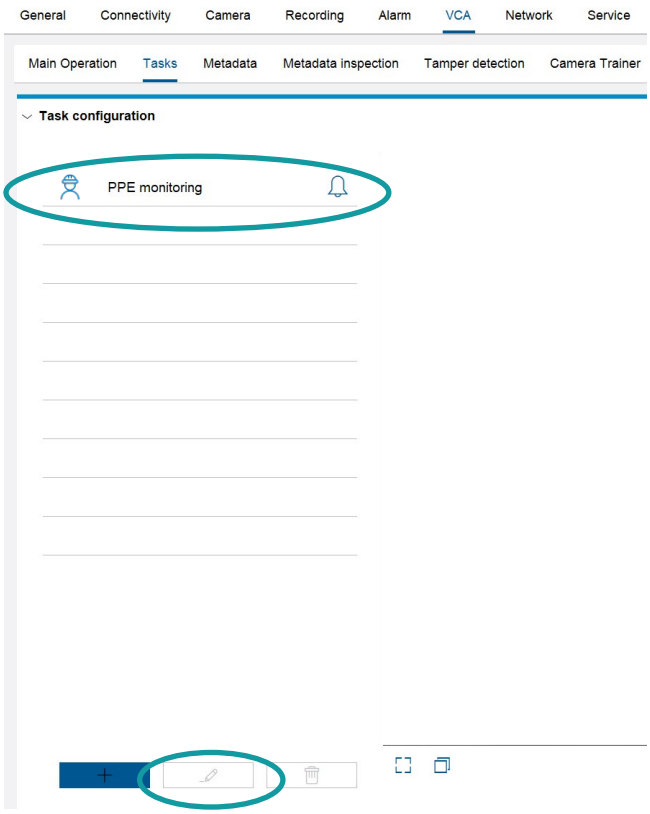
In the Configuration Manager, select the target camera, then go to **VCA** -> **Main Operation**. Set the **Analysis Type** to **IVA Pro PPE**. The Tracking parameters will change automatically to **PPE Monitoring (2D)**.



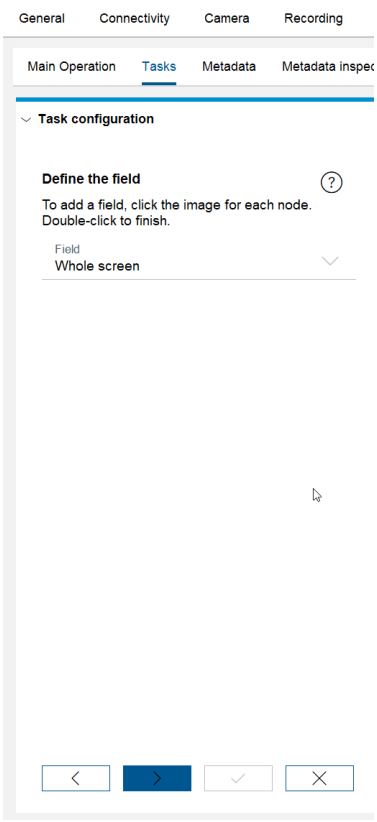
The default task is PPE monitoring, which will alarm if either safety vest or hard hat are missing. Note that all tasks from IVA Pro Buildings are available as well and can be set by adding new tasks via the + Button.

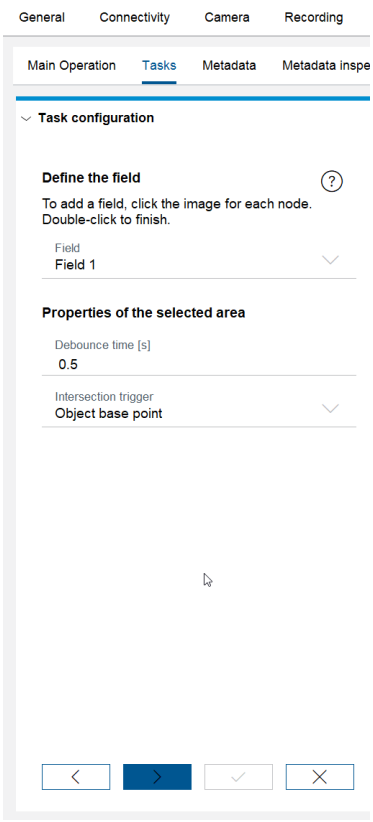
4.2 Configuring the PPE monitoring task

To adjust the **PPE monitoring** task, select it and then click on the edit icon.

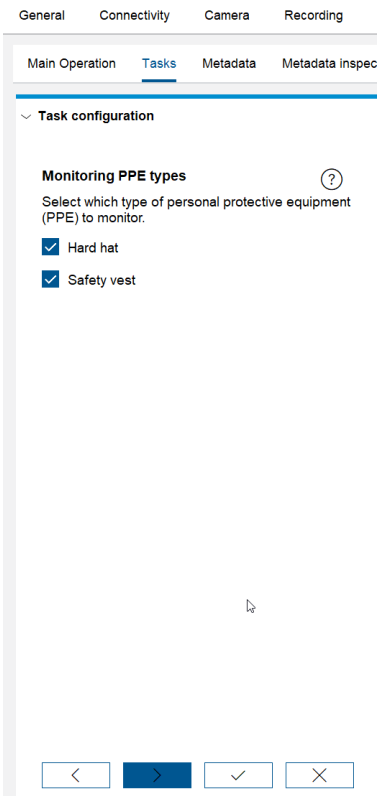


The PPE monitoring can be restricted to a selected area in the image. To draw this area, simply click into the video image for each node of the field. Double click to end the drawing with the last node. You can move each node, each line and the show field by selecting it accordingly in the image. The corresponding element will be highlighted when hovering over it, then click with left mouse to select, move, and release the mouse button. Each field also has a debounce time denoting how long an object needs to be in the field before it is considered for PPE monitoring, and an intersection trigger of object and field that selects which part of the object needs to be in the field.

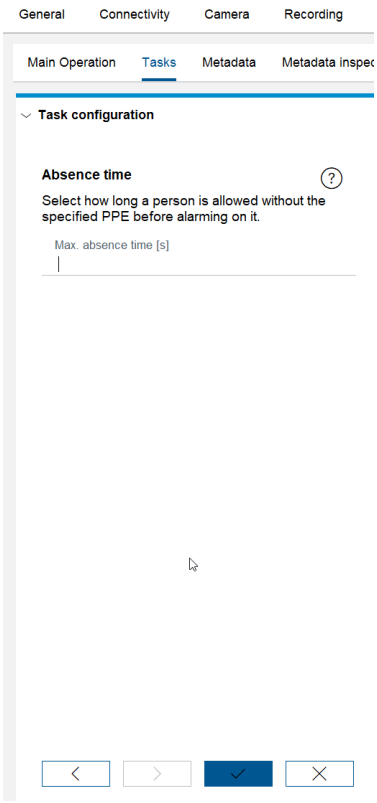




On the next page, select whether to monitor for both hard hat and safety vest or only one of them.

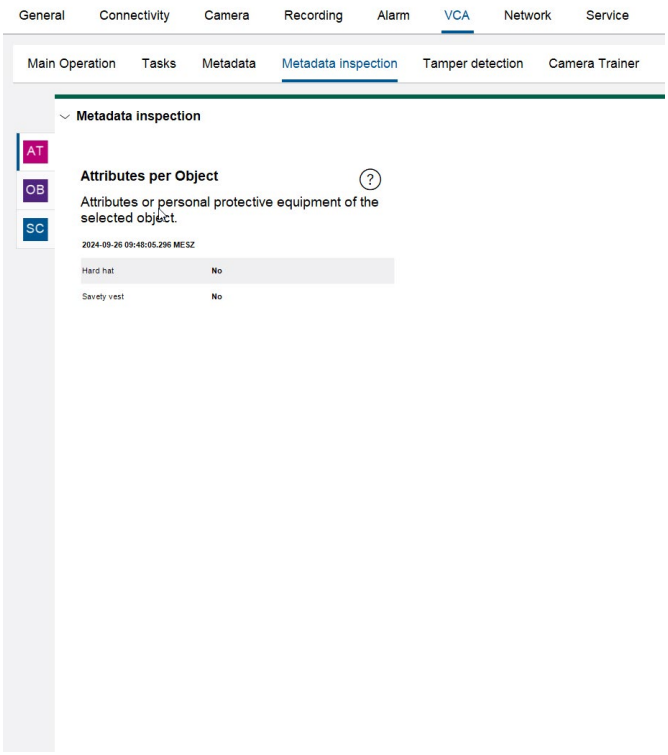


You can also configure how long a person is allowed in the monitored area without wearing a safety vest or hard hat. Note that PPE attributes are only evaluated every 3 seconds.



4.3 Visual Feedback

In order to see whether IVA Pro PPE detects safety vest or hard hat on a person, go to **VCA** -> **Metadata Inspection** and select a person. It may take up to 3 seconds to display the results.



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