

Camera-Based VMD Configuration for Honeywell IP Cameras and MAXPRO NVRs Application Note

This application note covers how to configure Video Motion Detection (VMD) based recording in a system containing at least one MAXPRO NVR and one or more Honeywell IP Cameras that support motion detection. VMD setup consists of:

- Event-based recording configuration on MAXPRO NVRs
- VMD settings on Honeywell IP cameras

Overview of MAXPRO NVR Recording Options

Each IP camera configured in the NVR can be set for Continuous (background) recording, event-based recording, or both.

When using event-based recording, Honeywell recommends that you:

- Set up recording on events at a higher frame rate
- Set up continuous (background) recording at a lower frame rate

Continuous (background) recording at a lower frame rate and event-based recording with boosted higher frame rate ensure that:

- Video recording is not missed in the event that the motion is not sufficient to trigger a VMD event on the camera; that is, the motion does not meet the configured VMD threshold on the camera.
- Video records longer than pre and post event recording with the lower frame rate; that is, Continuous (background) recorded video provides better forensics.

MAXPRO NVR supports recording at different frame rates for each camera using a single live stream from the camera and recording quality settings. The NVR Recording Quality Setting options for Continuous (background) and Event recording are:

- Same as Live
- Every Iframe
- Every Second Iframe
- Every Third Iframe.

Example

For a camera configured in the NVR with these settings:

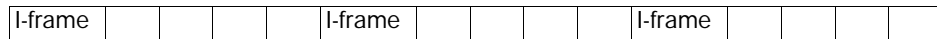
- FPS = 5
- GOP = 5
- Record Quality Setting: Background/Continuous Recording = Every Iframe
- Event Based Recording = Same as Live

The result is a Continuous (background) record rate of 1 FPS and a boosted event-based record rate of 5 FPS.

Note A combination of continuous and event-based recording from a camera can be achieved using the relationship between Frames Per Second (FPS) and Group Of Pictures (GOP).
FPS is a measure of the images every second from the camera, while GOP determines how frames are sequenced.
Every GOP starts with an I-frame (full image) and is followed by smaller images which are relative to the images preceding it. So, for a GOP of 5 there will be one I-frame for every 5 frames.

Figure 1 is an example of three seconds of video at 5 FPS and 5 GOP.

Figure 1 I-frame Example



The NVR record Quality Settings for Continuous (background) and Event recording can be used to achieve different level of FPS by selecting one of the following options:

- **Same as Live:** Every frame is recorded (5 FPS in the example)
- **Every Iframe:** Every I-frame is recorded (1 FPS in the example)
- **Every Second Iframe:** Every second I-frame is recorded (1 frame every 2 seconds in the example)
- **Every Third Iframe:** Every third I-frame is recorded (1 frame every 3 seconds in the example)

For more detailed information on the relationship between FPS and GOP and example settings to achieve different frame rates, refer to the *MAXPRO NVR Operators Guide*.

Configuring the NVR

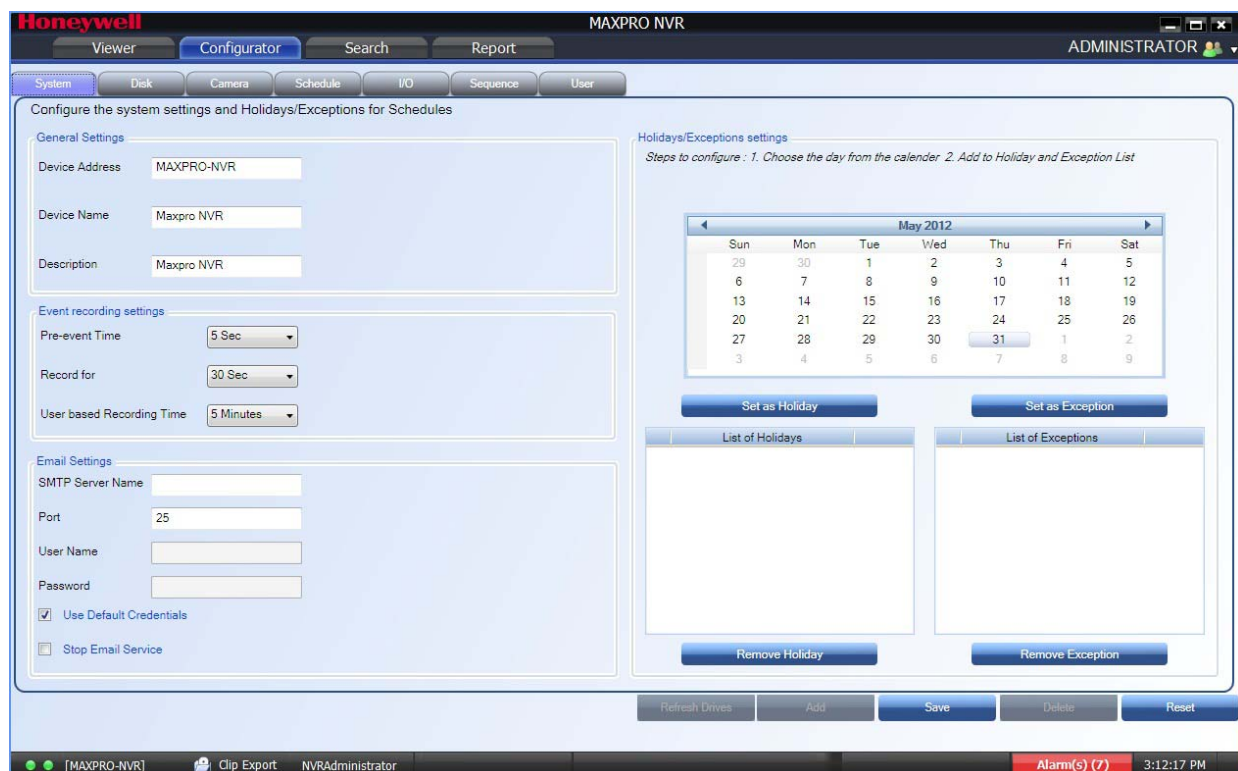
Launch MAXPRO NVR.

System Settings - Pre and Post Event Recording

To configure pre- and post-event recording:

1. Click the **Configurator** tab and then the **System** tab to open the System Configuration screen.

Figure 2 System Configuration



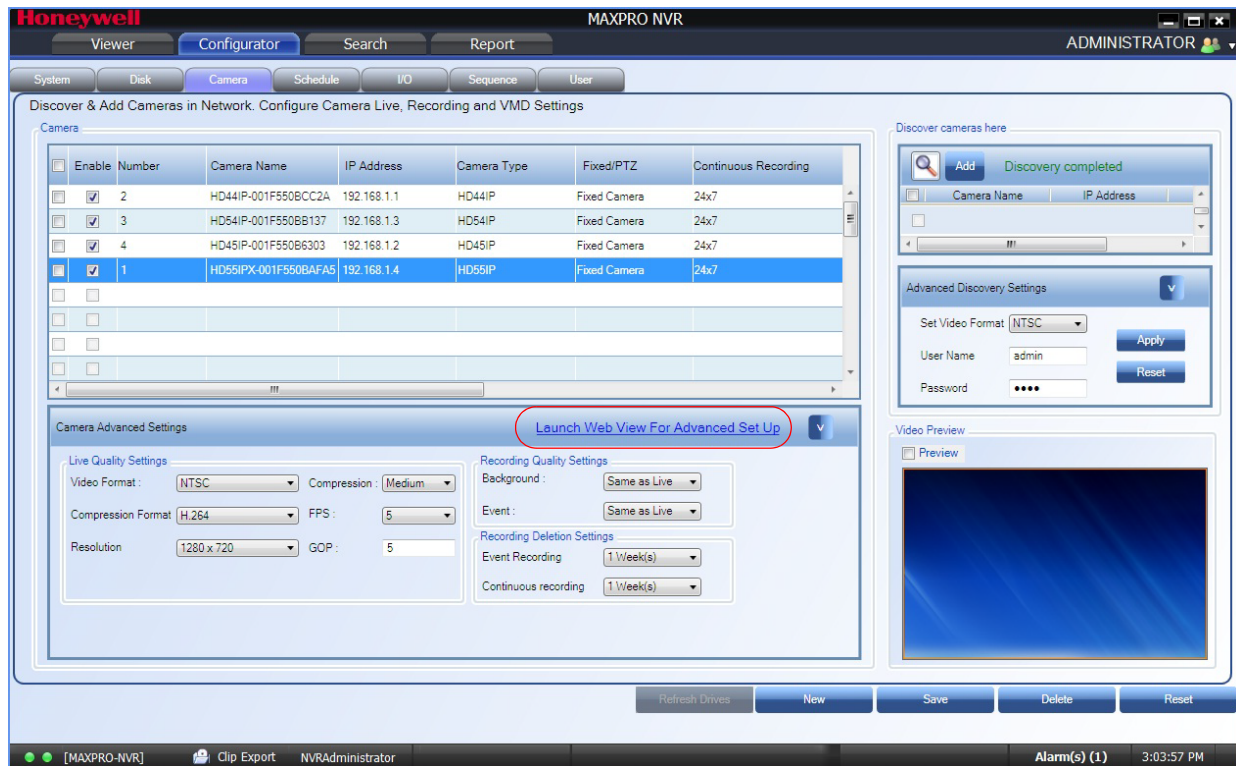
2. The default **Pre-event Time** is 5 seconds. This is the amount of time that the NVR records or boosts recording frame rate prior to the motion event trigger time. You can set this value from NONE to 15 seconds.
3. The default **Record for** time is 30 seconds. This is the amount of time that the NVR records or boosts recording frame rate after the motion event trigger time. You can set this value from 1 to 30 seconds. Honeywell recommends that you retain the default setting of 30 seconds to get optimal recorded time on an event.


Configuring Camera Settings for VMD-Based Recording

To configure camera settings for VMD-based recording:

1. Click the **Configurator** tab and then the **Camera** tab to open the Camera configuration screen.

Figure 3 Camera Configuration



2. Select a camera to configure the following items in the Camera pane:
 - a. **Continuous Recording** (default=24x7): In the Continuous Recording drop-down list, select the appropriate value. Honeywell recommends 24x7 for continuous recording. There are several standard options for scheduled recording. You can define additional schedules in the Schedules tab.
 - b. **Event Based Recording** (default=NONE): In the Event based Recording drop-down list, select the appropriate value. Select a setting other than NONE to activate event-based recording. The typical setting would be 24x7. There are also several standard options for scheduled recording. You can define additional schedules in the Schedules tab.
3. **Camera Advanced Settings**: Click the up arrow () in the **Camera Advanced Settings** window at the bottom of the screen to open the Advanced Camera Settings window. Advanced settings include:
 - a. **FPS (Frames Per Second)**: This is the live view frame rate (default value is 5 for high definition cameras). This value and the GOP value are used in the calculation for Continuous (background) or Event recording rate.
 - b. **GOP (Group of Pictures)**: GOP determines how the frames are sequenced. The default is 5 for high definition cameras. This value and the FPS value are used in the calculation for Continuous (background) or Event recording rate.

- c. **Recording Quality Settings - Background:** Set this field to **Same as Live** to have a continuous record rate equal to the FPS setting. Alternately, select **Every Iframe**, **Every Second Iframe**, or **Every third Iframe** for a lower continuous frame rate based on the FPS and GOP values.
- d. **Recording Quality Settings - Event:** Set this field to **Same as Live** to have an event-based record rate equal to the FPS setting. Alternately, select **Every Iframe**, **Every Second Iframe**, or **Every third Iframe** for a lower event-based frame rate based on the FPS and GOP values.
- e. **Advanced Setup:** Click **Launch Web View for Advanced Set Up** to go to the camera web page to set the camera settings (see [Configuring the Cameras](#)). At the Camera Login, enter the User name and the Password (default is **1234**) for Honeywell IP cameras.

Configuring the Cameras

Use the Camera Web Client to configure VMD on the camera itself.

Configuring Motion Detection

For motion detection, an Administrator can enable and configure up to five zones within a scene. The enabled and configured zones are monitored for motion.

1. Click the **Video Analytics** tab.
2. Click the **Region** drop-down list in the **Video Motion Detection** pane, then select a region from the five available.
3. Click the **VMD** drop-down arrow, and then select **Enable**.
4. The regions appear as colored rectangles in their default positions. Click and drag the box to resize and place it over the camera image. This box is the region of interest.
5. Click **Motion Threshold** and then select the sensitivity level:
 - Low (30%) (most sensitive)
 - Medium (50%)
 - High (80%) (least sensitive).

We recommend that you use the medium sensitivity at 50% as the initial setting. It can be further adjusted as explained in [Fine Tuning the Video Motion Detection on page 6](#).

6. Click **Apply**.

Note To ensure that the VMD settings have been applied, click another tab, and then back to the **Video Settings** tab. Check the VMD settings for the changes you made.

In the unlikely event that the VMD settings are not applied, please try logging out of the software and logging back in. Then repeat [step 1](#) through [step 5](#) above.

Disabling Motion Detection

To disable a zone, click the **VMD** drop-down arrow and then select **Disable**.

Fine Tuning the Video Motion Detection

For optimum results, adjust the VMD configuration to match the camera field of view, regions of interest and other factors. The recommended configuration procedure is:

1. Identify areas in the image where motion detection alarms should be triggered.
In some applications, motion anywhere in the image needs to be reported. In other applications, you may wish to monitor specific areas such as doors, parking lot entrances, or other areas of interest.
2. Select one of the five available regions for each area of interest and draw the region-of-interest box for that region to fully cover the area of interest.

Note The camera only measures motion inside the drawn box. For example, a person or vehicle moving along the boundary of the box may or may not trigger an alarm, because their motion is only partially evaluated. Therefore, it is important to adjust the region-of-interest boxes to fully cover the required areas of interest.

3. Test your initial configuration setup by observing VMD performance to ensure that relevant scene motion triggers alarms and to ensure that the camera is not reporting false alarms (such as VMD alarms triggered due to image noise).

In cameras with a wide field of view, or when activity happens far away from the camera, people and vehicles may appear rather small in the image. In such cases, it may not be possible to apply a single area of interest to the whole field of view to reliably detect motion. In such cases, Honeywell recommends covering the camera view with multiple, smaller region-of-interest boxes, concentrating on specific areas where motion alarms are important, such as entrances, restricted access areas, and so on.

4. Use the medium sensitivity of 50% as the initial setting. You can adjust this further if required.

Note Observe VMD performance in all expected lighting conditions after the initial configuration is applied. Ensure that relevant scene motion triggers alarms and ensure that the camera is not reporting false alarms (such as VMD alarms triggered due to image noise).

Increasing VMD Sensitivity

If the relevant scene motion does not trigger VMD alarms, try the following adjustments to increase VMD sensitivity:

- Decrease the sensitivity level from 80% to 50%, or from 50% to 30%. This change causes smaller objects to trigger alarms and it requires smaller contrast level to report an alarm. This should be the primary adjustment mechanism.
- Reduce the size of the region-of-interest box and, if needed, add more regions. Note that this adjustment causes smaller objects to also trigger VMD alarms.

Note After VMD sensitivity is increased, observe the performance in other lighting conditions in case further tuning is required to prevent false alarms.

Decreasing VMD Sensitivity

If VMD alarms are triggered even when there is no motion and no significant changes in the video, try the following adjustments to decrease VMD sensitivity:

- Increase the sensitivity level from 30% to 50%, or from 50% to 80%. This primary adjustment mechanism increases the required contrast level (or amount of noise) required to trigger an alarm. Higher sensitivity levels also require larger amounts of motion to be observed before a VMD alarm is triggered.
- Increase the size of the region-of-interest box. This adjustment prevents smaller objects (or smaller areas of noise) from triggering VMD alarms.

VMD Configuration Examples

The sensitivity level examples below are provided only for illustration. Other factors such as lighting level, contrast, and image noise may affect VMD performance and may require further tuning adjustments as described above.

Normal Field of View

In a normal field of view, with a person walking in front of the camera, the maximum recommended region-of-interest box sizes would be as shown by the red boxes in [Figure 5](#).

Figure 4 Sensitivity Level Comparison: Normal Field of View



Wide Field of View

In a wide field of view camera, the car shown below would be expected to trigger a VMD alarm if the VMD region-of-interest box is not larger than indicated by the red box.

Figure 5 Sensitivity Level Comparison: Wide Field of View



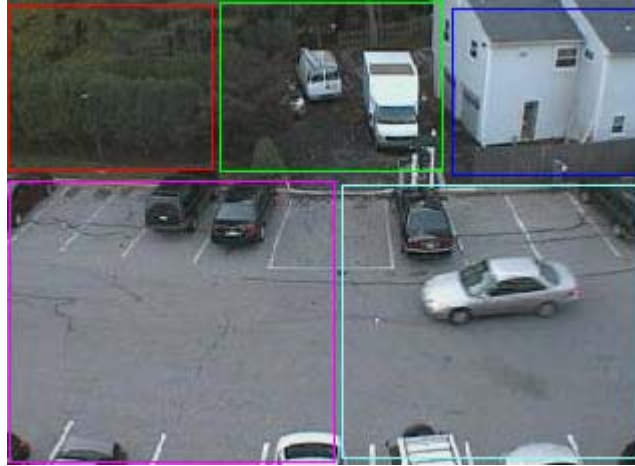
Combination Field of View

For cameras with a wide-angle field of view covering a large outdoor scene, people who walk far away from the camera might appear rather small in the image. If motion needs to be detected in the entire field of view, the following region-of-interest box configuration is recommended:

- Three smaller boxes, set to 30% sensitivity, covering the upper portion of the image where people appear small.
- Two larger boxes, set to 50% sensitivity, covering the lower portion of the image where objects appear larger.

Figure 6 illustrates a typical region-of-interest box configuration in a combination field of view.

Figure 6 Combination Field of View Example



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