# Axis Camera Configuration Guide

Version 1.2

## Revision History

| Version | Date | Description | Author |
|---------|---------|------------------------|---------------|
| 1.0 | 2/2/22 | Draft created | M. Covington |
| 1.1 | 3/8/22 | Stream settings updated | M. Covington |
| 1.2 | 8/26/22 | WDR settings updated | M. Covington |

## Copyright

## Disclaimer

Please note that certain features, facilities, and capabilities described in this document may not be applicable to or licensed for use on a specific system or may be dependent upon the characteristics of a specific scenario or configuration of certain parameters. Please refer to your Rekor Systems Support at support.rekor.ai for further information.

## Trademarks

# 1    Introduction

The Axis camera allows customers to capture license plate recognition (LPR) data with accuracy. This configuration guide provides information on how to focus and zoom the camera, configure the image, and configure the stream.

# 2    Image Configuration

Capturing perfect night-time plate shots will lead to success.  If night capture works well, capture during the day will be correct.   The capture should be sharp, perfectly focused images with even brightness across the plate. Angle the camera so that the plates from passing cars are clearly visible for at least 2 seconds.



*Figure 1. Night Plate Capture Example*

Tips to configure the zoom settings:

- Ideally, configure focus and zoom at least one hour after sunset.  If you must configure during the day, turn the IR cut filter on.
- Zoom the camera so that nothing but the target roadway is in the camera frame.

To initially configure the focus settings:

1. Temporarily Set "Image → Max shutter" to a high maximum value (e.g., 1/60) so that the roadway is clearly visible. (See Figure 4)
2. Configure the focus to focus sharply on the roadway.
3. Reset "Max Shutter" to 1/500 or 1/1000 depending on distance to plate (close 1-2 lane shots should be 1/1000.  If the plates are further, shutter speed can be 1/500).
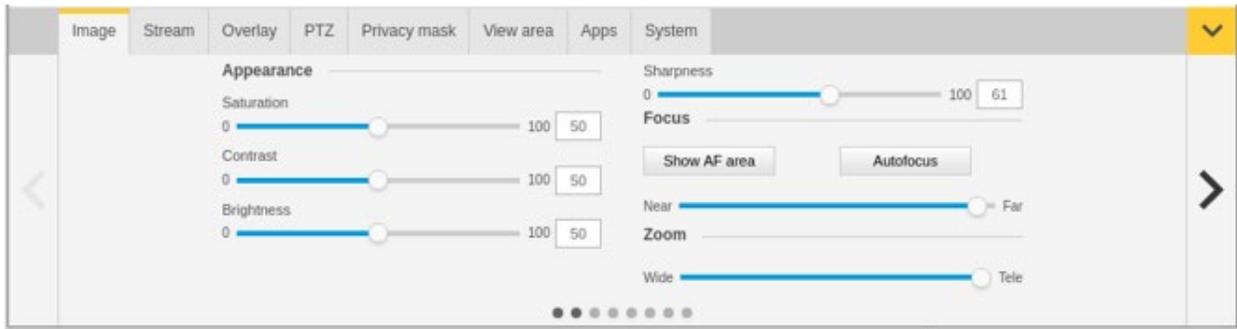
*Figure 2. Appearance, Focus and Zoom Image Settings*

1. To configure the Appearance settings, set the Saturation, Contrast, and Brightness to 50% and Sharpness to 60%.
2. Set Focus to Far (to the right).
3. Set Zoom to Tele (to the right).
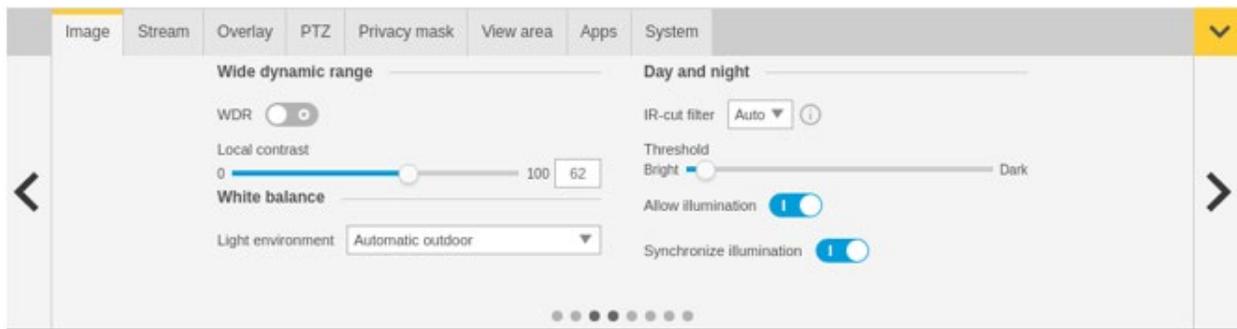4. Click the arrow on the right to move to the next Image settings.



*Figure 3. Wide Dynamic Range, White Balance, and Day and Night Image Settings*

5. The Wide Dynamic Range should be Off, with Local Contrast set to 60%.
6. The White Balance light environment should be set to Automatic Outdoor.
7. The Day and Night settings should be set as follows:
   - IR Cut Filter is set to Auto.
   - Threshold is set to Bright (to the left). The Threshold should flip to infrared mode while the scene is relatively bright.  Sunrise/Sunset has very little light and performs better with infrared and illumination
   - Allow Illumination and Synchronize Illumination are ON.
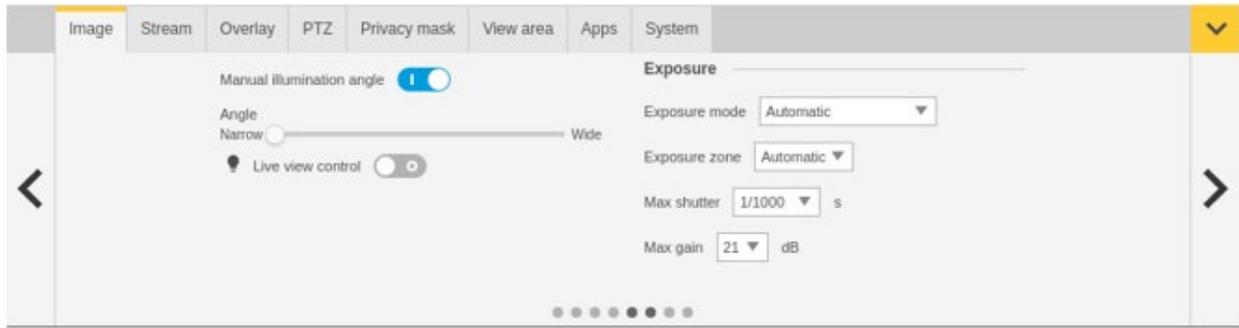8. Click the arrow on the right to move to the next Image settings.

*Figure 4. Day and Night and Exposure Image Settings*

9. The Manual Illumination Angle should be On.
   Note: By default the illumination angle (tightness of the IR beam) will adjust with the zoom. However, it's often desirable (when not fully zoomed) to push the infrared as far as possible to deliver as much possible light on the focus area. Setting this manually may improve performance.
10. The Angle is set to Narrow (to the left).
11. The Live View Control is Off.
12. The Exposure Mode and Exposure Zone should be set to Automatic.
13. The Max Shutter should be set to 1/1000, if the capture is closer (e.g., 1-2 lanes with little zoom). If capturing at a further distance, it can be lowered to 1/500s, but no lower. This setting also relates to aperture (i.e., tighter aperture may require that setting to drop to 1/500s).
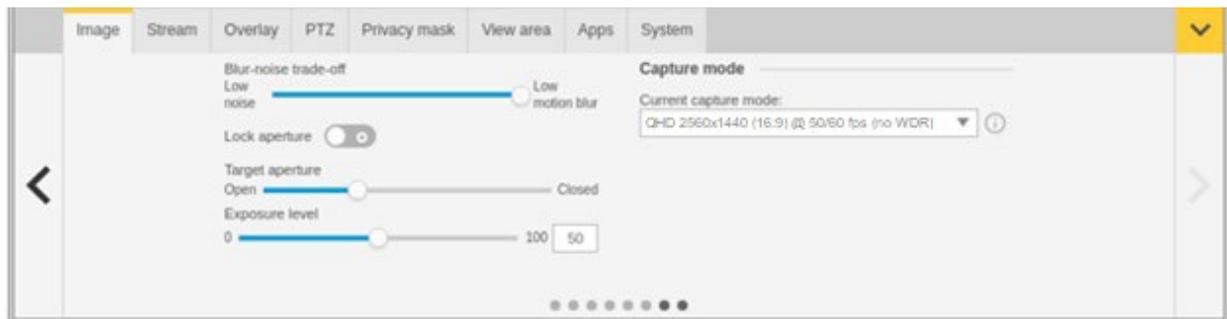14. Click the arrow on the right to move to the next Image settings.



*Figure 5. Exposure and Capture Mode Image Settings*

15. Set Blur Noise Trade-Off to low motion blur. Noise does not harm LPR performance.
16. Lock Aperture is Off. Target
17. Target Aperture and Exposure level is variable because it relates to focus and shutter speed. On average, the Target Aperture is set to the middle of the slide and the Exposure Level is 50%. For more information, see:
    https://www.sony.com/electronics/support/articles/00025973
18. The Capture Mode is set to QHD 2560x1440 (16:9) @ 50/60 fps (no WDR).

## 2.1 Stream Configuration

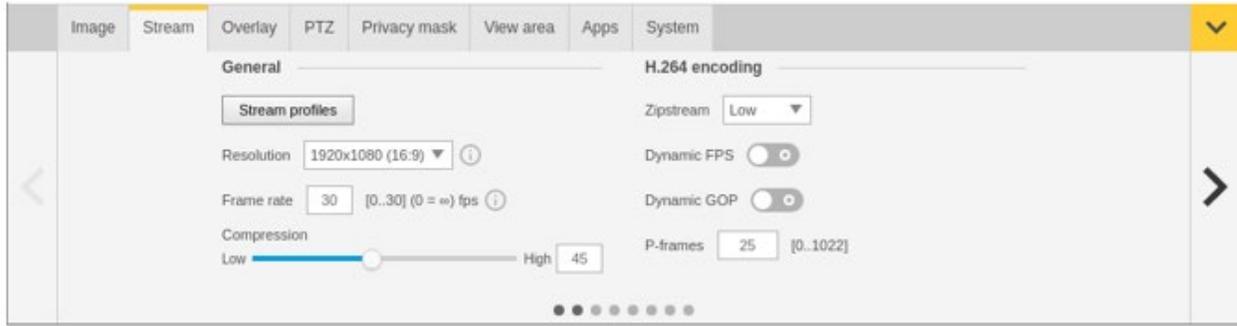Click the Stream tab to configure the Stream settings.



*Figure 6. General and H.264 Stream Settings*

1.  Set the Resolution to 1920x1080. If the system is a two+ camera system and the roads are 1-2 lanes, dropping to 720p may improve performance.
2.  Set the Frame Rate to 30.
3.  Set the Compression to 45%.
4.  Set the Zipstream to Low.
5.  Dynamic FPS and Dynamic GOP should be Off.
6.  The P=frames should be set to 25.
7.  Click the arrow on the right to move to the next Stream settings.



*Figure 7. H.264 and Orientation Stream Settings*

8.  Set the Compression profile to High.
9.  The Bitrate Control should be set to Maximum.
10. The Rotate should be set to 0 but can be modified, depending on how the camera is mounted.
11. Mirror should be Off.

| Image Settings | |
|---|---|
| **Configurable** | **Suggested Setting** |
| Appearance | 50 |
| Contrast | 50 |
| Brightness | 50 |
| Sharpness | 60 |
| Focus | Far right on slider |
| Zoom | Far right on slider |
| Wide Dynamic Range | Off |
| Local Contrast | 60 |
| White Balance | Automatic Outdoor |
| IR-cut filter | Auto |
| Threshold | Almost Dark |
| Allow Illumination | On |
| Synchronize Illumination | On |
| Manual Illumination | On |
| Angle | Narrow |
| Live Control | Off |
| Exposure Mode | Automatic |
| Exposure Zone | Automatic |
| Max Shutter | 1/500 (1/1000 if capture distance is close) |
| Max Gain | 21 |
| Blur-noise trade-off | Low motion blur |
| Lock Aperture | Off |
| Target aperture | Middle |
| Exposure Level | 50 |
| Capture Mode | QHD 2560x1440 (16:9) @ 50/60 fps (no WDR) |
| **Stream Settings** | |
| **Configurable** | **Suggested Setting** |
| Resolution | 1920x1080 (16:9) |
| Frame Rate | 30 (set to 15 on Edge 300 with 2 cameras.) |
| Compression | 45 |
| Zipstream | Low |
| Dynamic FPS | Off |
| Dynamic GOP | Off |
| P-frames | 25 |
| Compression profile | High |
| Bitrate control | Maximum (5000 kbit/s (or lower if needed) |
| Orientation | 0 (dependent on mounting position) |
| Mirror | Off |