

# Electronic Image Stabilization

Expectations for a camera's performance, no matter the application, are that it must work and provide clear usable images, regardless of any environmental or mechanical challenges the camera is exposed to.

These performance expectations have, and always will, drive technology solutions to compensate for difficult conditions and external challenges. Some of the more notable performance challenges where technology has made significant improvements are:

- *Poor lighting* - **Day/Night Filtering, Increased Sensor Sensitivity, Supplemental Illumination**
- *Difficult lighting scenarios* – **Wide Dynamic Range, Back-Light Compensation**
- *No light* - **LWIR, MWIR, SWIR Imaging Technology**
- *Vibration effects* – **Electronic Image Stabilization, Gyro Stabilizers**
- *Atmosphere Fog/Haze/Dust/Smoke* - **Image Defog**

CohuHD's Helios line of products offers the industry's first high-definition (720p) 30x video camera system with the highest optical zoom power combined with image defog processing<sup>1</sup> and **Electronic Image Stabilization ("EIS")** integrated in a single video camera solution.

The CohuHD EIS feature uses digital image stabilization technology. This technology calculates the amount and direction of motion and shifts each video image inside the camera to cancel out the effects of motion. It accomplishes this by utilizing pixels on the outer border of the images to provide a buffer area of pixels for the motion compensation. This process slightly reduces the overall image size as it uses a small amount of digital zoom (1.2x) outside edge buffer of pixels in order to use for the EIS process. The EIS function has the following properties;

Mode : ON or OFF - Manages the EIS feature being applied or not. The EIS feature  
Frequency : 5Hz or 10Hz compensation – Allows users to optimize the effect of the EIS feature based on the vibration environment the camera is subjected

The functional steps the EIS process performs are described below.

## Electronic Image Stabilization Process Steps

The camera system uses a gyro sensor to detect vibration and generate an angular velocity signal used for the EIS compensation process.

1. It then detects and deletes inconsistent (non-sinusoidal) vibration components (i.e. Pan/Tilt motion) from the angular velocity signal.
2. Next, it calculates a vibration compensation component from the angular velocity signal and angle signals.
3. Finally, it creates an electronic zoom control signal in response to the vibration compensation component, and sends this into the camera DSP for input to the Electronic Image Stabilization (EIS) process control.
4. The EIS process output controls the region of interest cropping from each image according to the electronic zoom control signal.

Refer to Diagram 1 for a functional block diagram showing the EIS process flow inside the camera system.

<sup>1</sup> Refer to <http://www.cohuhd.com/content/whitepapers> for CohuHD whitepaper on this topic

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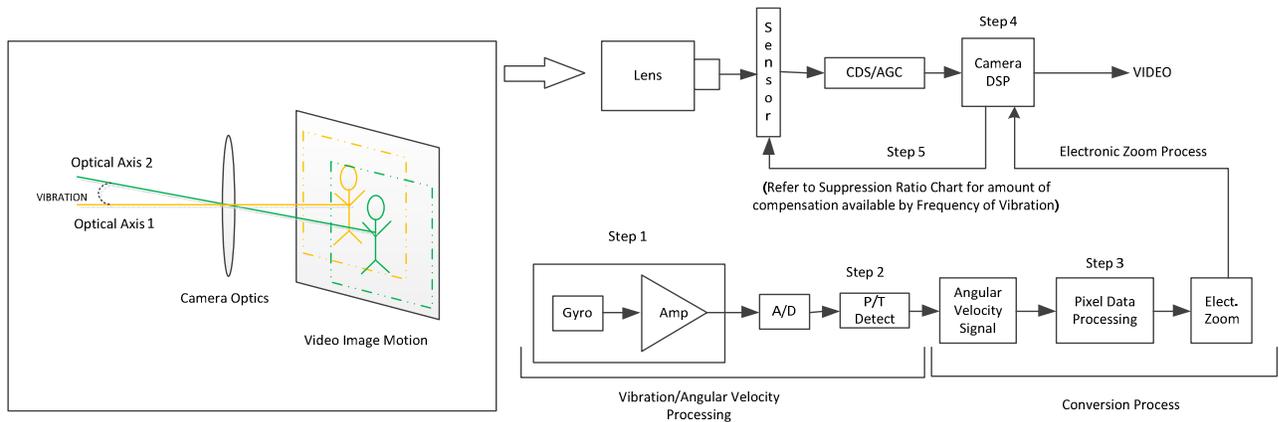
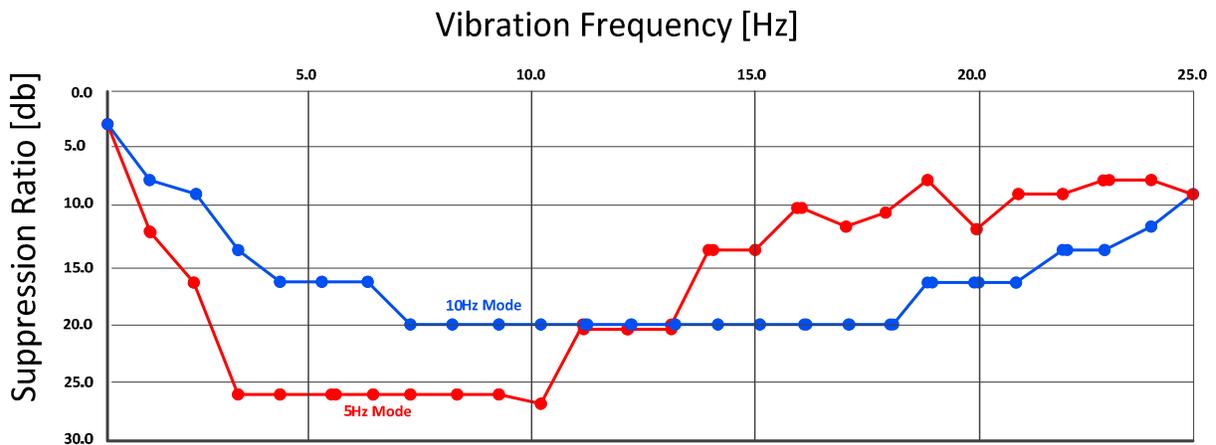


Diagram 1

The effectiveness of the EIS feature is graphed in Diagram 2 indicating the amount of suppression/cancellation effect in db that can be applied relative the frequency of the vibration component. The suppression/cancellation effects of the EIS feature are greatest when the camera lens is at its widest angle setting, and will be reduced as the lens is zoomed in.



## Conclusion

CohuHD's video enhancement functionality responds to the growing demand for outdoor camera systems that provide increased visibility and image quality under poor weather and vibration prone environments. CohuHD's real-time electronic image stabilization feature produces clear video in environments commonly encountered in surveillance and traffic monitoring. Using CohuHD's latest 720p 30x camera imaging technology - EIS as discussed here, as well as image defog, improvement of low light sensitivity and increased zoom magnification - ensures high quality video under a wide variety and changing outdoor conditions.

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## About CohuHD Costar™

[CohuHD Costar™](#) is a leading manufacturer of high-definition video surveillance camera systems designed for the performance requirements associated with critical infrastructure applications and is now part of [Costar Technologies, Inc.](#)

CohuHD Costar solutions integrate the latest high-definition video imaging and compression technologies into our ruggedized camera products. CohuHD Costar is a high-value, solutions provider for monitoring in the most critical, sensitive environments. We focus on providing the most reliable, rugged, outdoor PTZ cameras in the market.

For more than 50 years, we have manufactured in the U.S. the most reliable, rugged video cameras available.

For more information on CohuHD's products, please visit [www.cohuHD.com](http://www.cohuHD.com). Follow us on [youtube.com/cohuhd](https://www.youtube.com/cohuhd), [twitter.com/cohuhd](https://twitter.com/cohuhd), [linkedin/company/cohuhd](https://www.linkedin.com/company/cohuhd), and [facebook.com/cohuhd](https://www.facebook.com/cohuhd).