

Rotation Correction

The Rotation Correction application software enables the surgeon to stabilize the 'horizon' in an endoscopic video feed while rotating the scope.

An angled endoscope (typically 30-degree or 45-degree) is used to improve the viewing range by rotation. As the surgeon and assistant use both of their hands when using the angled endoscope, this necessitates one of them interrupting their task to rotate the scope against the camera. When doing so, the camera must usually be kept fixed while rotating the scope. With this Rotation Correction, the 'horizon' in the endoscopic video feed is not rotating.

Rotation Correction implements a method to automatically detect and undo unwanted image rotations. The rotation compensation feature adds two frames to the video distribution latency.*

* Based on Sony internal testing. Latency varies and depends on usage conditions.

Key Features

GPU Powered Solution

NUCLEUS™ is a data processing platform combining advanced hardware and software capabilities. Rotation Correction is one of the application implemented in NUCLeUS Core and correction processing is completed by NUCLeUS Core. Data is sampled at the NU-IP3T IP converter transmitter and sent to the NU-CP30B NUCLeUS Compute back-end over the network. Here an algorithm continually analyzes the incoming endoscopic video feed and estimates the rotation of the video source. This is based on extracting accentuated corner points, which are used as anchor points to cancel out perturbations over a time series.

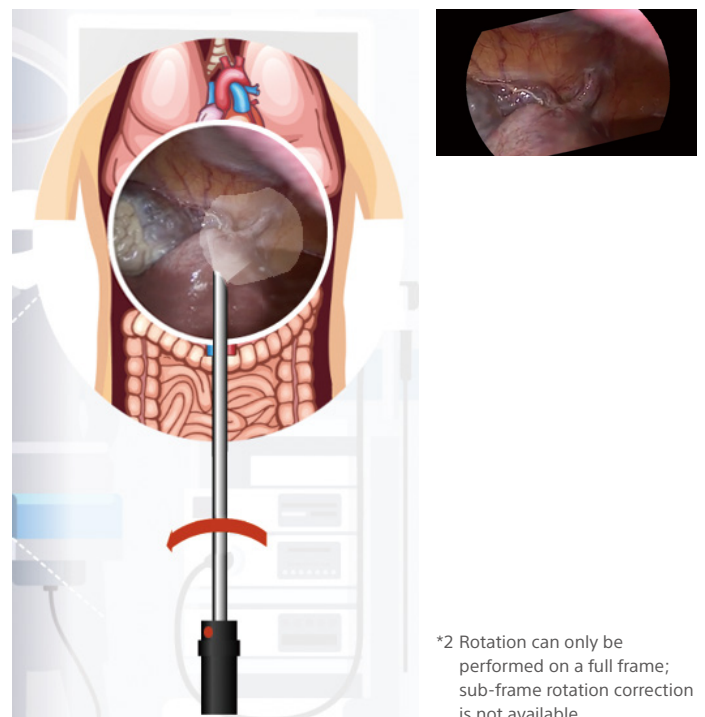
If a reliable estimation for the current frame can be made, a prediction algorithm generates the rotation values for the near future. The GPU technology in the IP converter helps NUCLeUS Core processing speed of the actual image rotation. As the correction does not use the same video frame as the estimate, the computation time has no direct influence on the latency of the visualized image stream. The rotation compensation feature adds two frames to the video distribution latency.*¹

*¹ Based on Sony internal testing. Latency varies and depends on usage conditions.

A Platform Approach

This software-driven app combined with GPU hardware acceleration on the IP converter maximizes system performance and minimizes latency.*² Hand-to-eye synchronization becomes possible, and embedded computational power increases when the installation grows. This allows implementing a complex algorithm with an increasing number of video channels over time, without incurring bottlenecks in computing power and bandwidth.

It is possible to load newer versions and alternative algorithms centrally in NUCLeUS. This opens up a new world of computer-assisted process supported by the NUCLeUS platform. The software implementation of algorithms in the NUCLeUS platform enables a future-proof and evolving approach.



*² Rotation can only be performed on a full frame; sub-frame rotation correction is not available.

Specifications

Features	
Corrected Angle	Free angle*1
Video Delay	1 frame (rotation requires frame to complete)
Resolution	Up to 4K*2 @ 60 fps 4:4:4*3

*1 Rotation correction results in a duplicate video feed original video feed also remains available.
Manual calibration of the horizon via Rotation Correction control interface

*2 Optional license is required for 4K

*3 Support signal type, resolution and frequency are limited.

Ordering Information

Product reference; **NU-RT30E**

For more details, please contact your nearest Sony dealer.
This product is non-medical device.

Related Products

NUCLeUS Compute
NU-CP30B

NUCLeUS Core
NU-CR30B

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