

Alticom Vision™ Corporation 24 November 2009

Overview

This Alticom™ Video Processing System (AVS) is an inline video processing expansion board for use in Insitu™ UAS.

AVS is installed in the avionics bay and becomes an integral part of the Alticom™ turret.

AVS processing takes the jitter out of the image. It also provides video feedback to the turret for ultra-stable pointing, allowing hands-off surveillance operations at high zoom for extended periods of time.

This board is compatible with all Alticom™ turrets and can be retrofitted to all Insitu™ UAS.

Highlights

- 13.2 V, 5.5 W
- **Video:** NSTC in, NTSC out
- **Delay** up to 3 frames.
- **Video Processing includes:** rotation, stabilization and tracking, image enhancement and false colors.
- Provides high quality video to local ground operators.
- SCENE and TRACK stabilization modes keep turret pointing ultra stable. The video stabilization modes work in conjunction with all advanced Alticom Vision™ stabilization systems, including Hold Mode.
- On board processing offers tracking persistence and faster tracking performance to greatly reduce operator workload.



Processing Board and Cable



See details such as possible gas tank delineation and shadow of vehicle.



False colors better define images and help clarify features.

- Provides high quality video to local ground operators.
- SCENE and TRACK stabilization modes keep turret pointing ultra stable. The video stabilization modes work in conjunction with all advanced Alticom Vision™ stabilization systems, including Hold Mode.
- On board processing offers tracking persistence and faster tracking performance to greatly reduce operator workload.
- 2 spare RS-232 connector for Rover-L or other video/data transceivers or for GuideStar™ data packets.
- Spare metadata processor for video tagging.

Expansion Board Features

Compatibility: Fits into Insitu™ X200 Avionics Module

Image Rotation: Makes all Alticom™ images appear as pan-over-tilt for product compatibility.

Video Stabilization: Advanced Image Dejitter is independent of video transmission quality. Subpixel accuracy with very low leakage.

Video Tracking: BOX MODE - Part of image is tracked, the turret follows a box. Responsive, persistent, does not depend on video transmission quality.

Video Tracking: SCENE MODE – Robust tracking based on the entire image. Much improved video stabilization mode. Allows for hands-off operations for extended periods of time. Responsive, persistent, does not depend on video transmission quality



Frame 1 + Frame 2: Uncorrected

This image is generated by superposing 2 actual video frames captured by an Alticom Vision™ turret in windy conditions. It shows how the scene is blurred by imager motion.



Frame 1 + Frame 2: Corrected

This image shows the result of video processing: the new frame is shifted before it is displayed: the fence, the road and the entire scene are now steady. Meanwhile, the vehicle has moved within the scene. Tracking will follow this object

Advanced Color Mode: Add false colors to black & white imagery.

Advanced Video Processing: Digital zoom centered on tracking box.

L-Band Rover Compatible: Expansion Board compatible with existing L-Band Rover transmitter for Alticom Vision™ 6000 operators.

L/S Band Winglet Transceiver: Two spare connectors with serial interface and power to connect to other transceivers and receive local operator commands.

Video Processing Basics

These images illustrate how Video Processing works. In the first example frame, the image has shifted because of the motion of the imager.

The object, a vehicle, within the scene is jittery and is also moving down the road.

Dejitter estimates the motion of the entire scene. The new frame is shifted by AVS so that it best aligns with the previous frame.

Tracking follows a subset of the image. A box is drawn around the portion of the frame that best matches the image in the previous box.

The result is a significantly improved image, even at tight zoom (1° FOV or less) with reduces the operator workload.

Stabilization modes:

SCENE Mode: the turret is driven based on the correction needed to superpose the new frame with the old frame.

TRACK Mode: the turret is directed to move from information that is based on the box location within the frame.



ALTICAM VISION™ CORPORATION
3100 CASCADE AVENUE
HOOD RIVER OR 97031

T: 541.387.2288
F: 541.387.2266

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