SightLine Applications provides onboard video processing to integrators.

Make your system **AMAZING**!
APPLICATIONS

Advanced Video Processing for a Wide Range of End Uses (Civil, Commercial, and Military):

- Intelligence, Surveillance & Reconnaissance (ISR)
- Border Patrol / Law Enforcement / Search and Rescue
- Fire / Environmental Survey
- Infrastructure Inspection
- Industrial Security
- Agriculture & Resource Mapping

Airborne / Aerostat / Ground / Marine Unmanned / Manned
Onboard Video Processing

Why ONBOARD

- Tight Integration with Camera Systems
- Low Latency Feedback
  - Gimbal Pointing
  - Operator Situational Awareness
  - Landing Guidance
- Enables FULL-DIGITAL Video Path
  - Best Video Quality for Processing and Operator
  - Easy Compatibility with IP Radios, Rovers, etc.
- Reduced Ground Station Complexity
- Low Size, Weight, and Power (SWaP)
Typical Integration:  
Stabilized Gimbal

Gimbaled Camera System
Typical Integration:
Small UAS Servo Gimbal

- Camera 1: Daylight HD
- Camera 2: Infrared SD
- Video Radio Link (Often Video and Data Radio Link)
- Video (analog or H.264)
- SightLine Video Processor Board
- RS232 or Ethernet
- Video Tracker Telemetry
- Often from Autopilot
- Control Interface
  - Often same as Video Link
- Ground Control Station
  - Operator Interface (UI)
  - UI is often part of Autopilot System
- Autopilot or Futaba PWM receiver
- Optional COTS Inertial Stabilizer

Aircraft Equipment

Gimbal Control Processor
Often is the Autopilot
(NOT A SightLine Product)

PWM Pan and Tilt Servos
Typical Integration

Fixed Camera Support

**SightLine Video Processor**
- Encoding to H.264
- Stabilization / Roll Correct
- Recording
- Autofocus
- MTI / Tracking
- Multi-spectral blending

**SYSTEM**
- **Video**
  - Often a Video Radio Link
- **Command and Control**
  - Record Commands (Start Stop)
  - Snapshot Commands
  - Encoder Settings

**Lens Control**

**Lens**

**Camera 1**
- Video 1
  - Analog or Digital (to HD)

**Camera 2**
- Video 2
  - Analog or Digital (to HD)

**Direct Serial Focus Control from SightLine**

**or**

**Focus Telemetry to Customer Processor**
SIGHTLINE ADVANTAGES

Flexible Solutions
- Complete HW/SW solutions – provides a range of processing options
- Customizable configuration to support best feature set for customer budget
- Customer Interface Board design support
- Agile Development Methodologies

Experience
- Extensive unmanned systems experience: micro gimbals, small gimbals, fixed
- Over 3,000 installations on both air and ground vehicles
- Approaching 1 Million hours in-theater experience with stab/track +, resulting in proven algorithms

Customer Support
- True engineering integration support
- No additional cumbersome tools necessary

Non-ITAR solutions
- SLA products are controlled under the BIS, EAR ECCN 4A994, 4D994
SIGHTLINE PRODUCTS
FULL FEATURED VIDEO PROCESSORS
SLA and SLE Options

SLA Family: Full Featured Video Processors
- Scene and Object Tracking Telemetry Data - Feedback to Steer Gimbaled Cameras
- Access to the FULL set of SightLine functions

SLE Family: Advanced Video Encoder / Stabilizer / Recorder
- Same Hardware and Base Software as SLA
- Attractive Price Point
- No Telemetry or Tracking
- Upgradable to SLA
### Video Stabilization
The starting point for all video processing improvements. Frame to frame registration provides corrections that dramatically improve video.

- Accurate frame to frame change detection
- Removes high frequency jitter

### Roll Correction
Registration also provides ability to correct camera frame to frame rotation, further improving the user experience.

- Correction of platform roll motion
- Aerostats, Towers, UAS
- Roll/nod gimbal configurations

### Scene and Object Tracking
Robust hands-free tracking of scene and designated objects. Onboard tracker provides low latency solution needed for nimble pointing control systems.

- Scene tracking = powerful, intuitive gimbal feedback mode
- Robust tracking – Automatic Track Re-initialization
- Track through temporary obstructions

### SLAnding Aid
Autonomous landing pattern tracker and flight control feedback.

- Autopilot interface to provide flight corrections to landing pattern
- Provides range, angle, yaw, offsets
- Independent of GPS
## Detection Functions

Multiple detection modes provide important situational awareness information and provide fast feedback **essential for effective track initialization on moving objects.**

- Detect very small moving targets
- Simple track selection method
- Three MTI modes support a range of applications
- Color based (histogram) difference detector algorithm helps find objects that are different that the scene background

## Video Enhancement & OSD

A range of functions are provided to enable enhancement options to optimize video for the needs of each application.

- Text, shapes and custom reticle overlays
- False color schemes
- Extended 14 bit-depth processing

## Video Presentation

A range of functions are provided to enable enhancement options to optimize video for the needs of each application.

- Picture-in-Picture
- Multispectral Blending
- Side by Side
- Switching
- Multiple streams
Video Encoding and KLV Metadata

Ethernet video outputs support new IP radio options and reduces system bandwidth.

- MPEG2 TS (H.264 +KLV metadata)
- MPEG4
- RTP M-JPEG
- KLV metadata to MISB standards
- Settings Flexibility
- Metadata on VBI lines over analog

HD Video

Providing a range of solutions to meet demand for HD video capabilities. OEM board specific.

- 1080p/30 on SLA-3000
- 720p on SLA-1500
- Adaptors for HD block cameras, HDSDI, HDMI

Video + Snapshot Recording

Onboard recording on SLA/SLE-1500. Interface board SD card for SLA/SLE-3000.

- Full resolution snapshot recording
- Snapshots with EXIF data
- Full pixel depth data .PNG snapshots with metadata (for radiometric data access)
- Telemetry data recording
The SLanding Aid supports autonomous landing operations by tracking an easy to place landing pattern.

The tracker provides pattern position, range, and angle to the vehicle landing logic, supporting a wide range of landing scenarios.

- Supports flexible approach ranges and angles
- Detection of people in landing zone
- Independent of GPS - Enables accurate landing in GPS-denied environments
- Replaces expensive laser based ranging systems. Inherently eye safe
- Integration of telemetry data to Autopilot to provide autonomous guidance:
  - Piccolo and PixHawk Integrations Complete
  - Customer Autopilot integration supported with full example code / no NRE
- Runs on both SLA-1500 and SLA-3000 video processors

Patents pending for both the pattern tracker and safety zone detection functions
## Application Focused Toolboxes

<table>
<thead>
<tr>
<th>Application</th>
<th>Toolbox: Value Adding Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Airborne Surveillance</strong></td>
<td>• Gimbal Control</td>
</tr>
<tr>
<td>(Mil, Law enforcement, Border, Search and Rescue, etc.)</td>
<td>• Stabilization</td>
</tr>
<tr>
<td></td>
<td>• Scene Steering / Object Tracking</td>
</tr>
<tr>
<td></td>
<td>• Detection Algorithms</td>
</tr>
<tr>
<td></td>
<td>• Auto-landing</td>
</tr>
<tr>
<td><strong>Natural Resources</strong></td>
<td>• Gimbal Control</td>
</tr>
<tr>
<td>(Fire, Wildlife, Mapping)</td>
<td>• Detection / Scene Steering / Tracking</td>
</tr>
<tr>
<td></td>
<td>• Full Pixel Depth Snapshot Recording</td>
</tr>
<tr>
<td></td>
<td>• Auto-landing</td>
</tr>
<tr>
<td><strong>Agriculture</strong></td>
<td>• Full Pixel Depth Snapshot Recording</td>
</tr>
<tr>
<td>(Multi-spectral imaging)</td>
<td>• NDVI based detection (in work)</td>
</tr>
<tr>
<td></td>
<td>• Auto-landing</td>
</tr>
<tr>
<td><strong>Infrastructure Inspection</strong></td>
<td>• Full Pixel Depth Snapshot Recording</td>
</tr>
<tr>
<td></td>
<td>• Multispectral presentation</td>
</tr>
<tr>
<td></td>
<td>• Detection Algorithms</td>
</tr>
<tr>
<td></td>
<td>• Auto-landing</td>
</tr>
</tbody>
</table>
SLE/SLA-1500-OEM
- Single Channel Processing
- Multiple Video Inputs w mux
  - 720p/30 digital video in
  - 2x Analog
- Small SWaP: 8g
- 1.0 x 1.5 in, 2W
- In Production

SLE/SLA-1500-SOM
- System-on-Module Integration onto Customer PCB
- LogicPD Torpedo SOM
- Lowest SWaP: Just 0.6 x 1.1 in
- Single Channel Processing
- No NRE design support provided
- In Production
SLE/SLA-3000-OEM
- Max performance option
- Multi channel solution
- HD Video input, 2 x streamed HD out
- All processing functions
- 3.5 x 2 in, 10W
- In Production

SLA-2000-OEM
- Four channel solution
- SD Video output
- Multi-camera gimbals
- PiP, Blending, etc.
- 3.4 x 3.9 in, 7W
- EXISTING PROGRAMS ONLY
ACCESSORIES 1500

SLA-1500-EAB
- 4 port Ethernet Switch
- 3 Serial Pass-Thru RS232
- 2 Analog Video IN + FFC digital
- 1.6 x 3.0 in, 3W

SLA-1500-RAB
- Adaptor board to Microhard Radios
  IPnDDL and pDDL (on adaptor board)
- 1 Analog Video IN + FFC digital
- 1.6 x 2.03 in

SLA-1500-ENC
- Enclosure Option
- Standard interface connectors
- 1 Analog Video IN + FFC digital
- 2.4 x 2.1 x 1.0 in

Bench Interface Board
- Ribbon to Tau/Quark/Tamarisk
- Hitachi Block
- Sony / Tamron Block
- HDMI

Camera Adaptors
Growing number of digital interface boards include:

Also have: POE interface, CameraLink, Airborne Innovations GS/720, HDSDI (in work)
SLA-3000-IO

- Bench / System Interface Board
- RJ45 Ethernet
- Alt Output Video (HDMI or analog or digital)
- Two input video slots
- Phoenix Block – DC in / RS232
- SD Card
- 2.4 x 3.5 in

ACCESSORIES 3000

Camera Adaptors
Growing number of digital interface boards include:

- Ribbon to Tau/Quark/Tamarisk
- Hitachi Block
- Sony / Tamron Block
- HDSDI In
- Dual Analog In
- HDSDI Out

Also have: CameraLink, Sony MA13x, HDMI
<table>
<thead>
<tr>
<th>Camera / Video Format Input</th>
<th>SLE/SLA-1500</th>
<th>SLA-2000</th>
<th>SLE/SLA-3000</th>
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<tbody>
<tr>
<td>Analog (NTSC/PAL)</td>
<td>2</td>
<td>4</td>
<td>3</td>
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<tr>
<td>Parallel digital (to 1080p)</td>
<td>1</td>
<td>1</td>
<td>2</td>
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<tr>
<td>Sony FCB-EH6xxx, FCB-EH31xx and FCB-EV7xxxx</td>
<td>Yes</td>
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<tr>
<td>Tamron 10x block</td>
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<tr>
<td>Hitachi DI-SC120R</td>
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<td>Camera Link</td>
<td>Yes</td>
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<tr>
<td>HD-SDI</td>
<td>In design</td>
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<td>HDMI</td>
<td>Yes</td>
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<tr>
<td>FLIR Tau and Quark IR</td>
<td>Yes</td>
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<td>Yes</td>
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<tr>
<td>DRS Tamarisk IR</td>
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</table>
### VIDEO OUTPUTS

<table>
<thead>
<tr>
<th>Video Format Outputs</th>
<th>SLE/SLA-1500</th>
<th>SLA-2000</th>
<th>SLE/SLA-3000</th>
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</thead>
<tbody>
<tr>
<td>Output Video Frame Size</td>
<td>720p</td>
<td>SD</td>
<td>1080p</td>
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<tr>
<td>Analog (NTSC/Video)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>10/100 Ethernet (H.264, MJPEG)</td>
<td>720p</td>
<td>SD</td>
<td>1080p</td>
</tr>
<tr>
<td>Video Recording</td>
<td>720p</td>
<td></td>
<td>1080p</td>
</tr>
<tr>
<td>HD Frame JPEG /PNG Snapshots</td>
<td>1080p</td>
<td></td>
<td>1080p</td>
</tr>
<tr>
<td>Parallel digital (to 1080p)</td>
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<td>Yes</td>
</tr>
<tr>
<td>HDSDI</td>
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<td>Yes</td>
</tr>
<tr>
<td>HDMI</td>
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</tr>
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</table>
Contact Us:

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✓ Call our technical sales team at +1 (541) 716-5137

Reference Materials:

✓ Our website: www.sightlineapplications.com provides information, video samples and documentation downloads (application notes, ICDs, drawings, etc)
✓ Watch sample videos on our YouTube page.