

# IMAGO-XG Video Tracker

## Performance Specification



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### The Philosophy Behind the XG System

Imago's new product line was designed to be flexible, upgradeable and supportable over the years. Once the customer has purchased the tracking system core, any component can be added with both time and cost efficiency as the tracking requirements change over time.

Too often, target tracker is left as a two-word line item on a customer's specification. IMAGO undertakes great effort to ensure that we are building tracking algorithms to track the types of targets our customers need to track. From the ground, this includes: fixed wing aircraft, rotary wing aircraft, short range seeker missiles,

mortar firings and dropped loads. From the sky this includes people, cars, trucks, boats, naval vessels and victims at sea that are not simply a dark spot on a bright background. Our tracking systems are "the brains" behind the brawn of our hardware

IMAGO is committed to ensuring that our systems will work effectively in the field and we are continually improving the intelligence of our tracking systems.



### IMAGO-XG PERFORMANCE

#### Video Tracking (Standard)

The IMAGO-XG uses an expert approach to tracking that works better than centroid or correlation trackers to provide reliable tracking for most ground to air tracking requirements. Our expert algorithms are further improved by using our integrated target state estimator in complex backgrounds.

If required, a "Contrast/edge/correlation" tracker is available

#### Tracking Algorithms(Optional)

- Colour
- Optical Flow
- Motion Analysis/Change detection
- Imago proprietary data fusion - (combines results from multiple algorithms)

#### Video Processing Capabilities (Optional)

- Multiple Targets: Video tracker can automatically switch gates to follow targets
- Multiple Gates (Typically 2 or 3)
  - Image event based switch (switch at payload drop)
  - Timing based switch (switch 2 seconds after drop)
  - Trigger based switch (TTL trigger event)
- Scene-lock
- Image stabilization for track on the move applications
- Parallel processing: Track from multiple cameras simultaneously (IR/CCD or WFOV/NFOV)
- Track from multiple cameras simultaneously (IR/CCD or WFOV/NFOV)

#### Video Tracking Performance

- Minimum Target Size: subpixel resolution targets can be tracked, best results are obtained with a 2x2 or larger
- Maximum Target Size: targets that fill the field of view can be tracked
- Track Stability: 0.5 pixels to 3 pixel track stability depending on track algorithm
- Target contrast (Minimum): 2% contrast for high level track confidence, 1% contrast with use of the target state estimator

#### Target Acquisition

- Full field of view sit-and-wait
- Joystick, mouse or touch-screen (if monitor purchased)
- Acquisition on event (TTL Trigger)
- Cue to GPS, radar, pointing or other optical device (optional)

#### Automatic Coast Capability

- If the target is temporarily obscured our target state estimation system will coast and reacquire the target when it reappears

#### External Alignment Algorithms (Optional)

- Survey to WGS84
- Local area surveys
- Celestial alignment/Star calibration
- Aircraft navigation system. Tracking the target for a short period of time and establishing the target frame of reference can achieve dynamic alignment to a moving target. No fixed reference points are required

#### Pan-Tilt & Gimbal Controllers (Optional)

All of our pan/tilt controllers are software based and can be integrated with our video tracking algorithms to allow the controller and the video tracker to work together to improve overall system performance. Our controllers will work with all IMAGO supplied pan/tilts as well as with customer supplied pan/tilts.

- The standard controller will control pan/tilts at rates up to 25 deg/sec in closed looped tracking
- The high performance controller is tailored to the pan/tilt and payload enabling the best tracking results. It uses both linear and non-linear control theory in the tracking process and will drive the pan/tilt (in close-looped tracking) at its approximately maximum published specifications
- Customers regularly track above 100 deg/sec. Track rates of 200 deg/sec can be achieved

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## Video Input

- Up to 6 Channel
- Analogue (NTSC, CCIR, non- standard, progressive scan, intensified cameras, IR cameras)
- High speed video (100 Hz to 200 Hz) (Optional)
- Digital (most digital formats are accepted). We have gathered photometric data using 16Mpixel, 12 bit sensors (Optional)

## Lens Selection

- Lens calibration algorithm is included, allowing the IMAGO-XG to work with any lens

## Output Log Files

The IMAGO-XG outputs a time stamped log file of target azimuth/elevation. The log file is in ASCII format and can be easily loaded into Excel, MatLab, Simulink and any other data processing application.

## Set Up and Calibration and Built in Tests

The IMAGO-XG includes set up and calibration software to initialise the system.



## Computer Requirements

IMAGO supplies the IMAGO-XG on an industrial grade rack mount PC. Laptop, desktop, transportable and single board computers are also available.

## Options

- Switch on the fly-tracking
- Track offsets
- Additional Video Tracking Algorithms that incorporate colour, motion analysis, and more complex pattern matching
- High performance controller to track more dynamic targets at higher rates.
- Integration of 3<sup>rd</sup> party pan/tilts or gimbals.

- Different coast models, based on target dynamics and pan/tilt motion
- Full field of view target acquisition
- Full field of view sit-and-wait motion analysis
- Cueing from/to radar, on-target sensors, etc.
- Stereo vision for range measurement from 50m to 3000m
- Fuse GPS, laser, radar and optical position data for robust position measurements
- Air to ground, interface with the aircraft navigation system
- Naval systems, interface with shipboard IMU
- Laser Range Finders
- Remote Control up to 7 km stand off distance

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## ABOUT IMAGO

IMAGO has been building low-cost, high-performance video target tracking systems since 1987. IMAGO's video trackers are software based, can be easily updated, and are designed to use commercial-off-the-shelf hardware.

IMAGO's earlier sales were for standalone video trackers but as our technology advanced, IMAGO has been able to offer higher levels of sophistication. The addition of laser-rangefinders, multiple tracker triangulation systems and automatic cueing from other sensors has increased the level of accuracy and automation.

Our tracking systems are used both by private and defence groups around the world.

