

A Modular Surveying and Targeting Platform

The GI-Eye system is a software platform that integrates GPS, inertial and digital camera data. It is designed for collecting high-resolution imagery to be used for precise visual navigation or accurate geolocation of target coordinates. The GI-Eye takes advantage of differential or kinematic GPS positioning to provide the precise location of each camera image, and uses NAVSYS' proprietary InterNav kinematic alignment algorithm to measure the precise attitude of the camera using the inertial sensor data. By recording the precise location and attitude of the video images, the extraction of feature location data is simplified and streamlined. This results in more efficient and rapid data processing – reducing the time required to generate high accuracy target or feature coordinates, and in some cases eliminating the need for expensive and time-consuming tie-point processing. The high-resolution imagery provides mensurated target coordinates and near real-time composite mosaic imagery suitable for viewing on the observers base station laptop. In addition, a precision digital elevation model can be extracted from the collected imagery.

The system can receive and process both range and carrier-phase differential corrections in real-time from Wide Area Differential GPS services or from a ground reference station using a standard RTCM serial interface. A wireless data link between the GPS/INS/Camera unit and the base station can be included in the GI-Eye System.

Embeds Easily into Existing or Sourced Sensors

Because the GI-Eye system is a software platform it can be embedded to run on existing processor platforms and utilize data from existing GPS, inertial, and visual sensors, reducing size and weight for your application. NAVSYS can also provide numerous sensors to meet the performance requirements of your application. Because of its modular design, it enables sensor upgrades over time with only software configuration changes.

Available for Aerial, Marine, and Terrestrial Applications

Applications of the GI-Eye system include generation of target coordinates from airborne or ground vehicles; autonomous georegistration of video (or other sensor) data for archival and to speed data processing; visual-aided navigation, mapping and feature geolocation; and GIS attribute data collection. Targeting systems have been developed for both commercial and government applications, including the National Geospatial-Intelligence Agency and Office of Naval Research.

The GI product line has also been used in stabilized thermal, low-light, and television imaging systems designed for surveillance and reconnaissance aboard airplanes, helicopters and UAVs. The system is employed in varied environments and customer sets for this application.



EXCELLENCE

IN

GPS

PRODUCTS

&

SERVICES

GI-Eye System Characteristics

Time accuracy: 250 nanoseconds (1-PPS output)

Position accuracy:

RTK GPS: 0.01 meter CEP

DGPS: 1.0 meter CEP

SPS (no DGPS): 10 meter CEP

Azimuth accuracy: 1 mrad (1-sigma)¹

Pitch/Roll accuracy: 300 urad (1-sigma)¹

Dynamics:

Velocity: 1000 meters per second

Acceleration: 4g (sustained tracking)

Host computer: ADL855 PC104 SBC

Internal Interface Cards:

GPS, DGPS, IMU serial interfaces USB

Storage capacity: >80 Gbyte Hard Drive

GI-Eye Interfaces

Operator console:

Windows XP GUI with Real-time navigation and imagery data display

1-pps:

Precise time sync output Digital image data files

Peak data rate:

1 frame/3 seconds (programmable log rate)

Data format:

TIFF file format (3056x2032 pixels)

Georeference data files:

Time, position & attitude data for each image (ASCII format)

Post-Test analysis data files

GPS & IMU raw data for post-processing with DGPS

Inertial Measurement Unit

Gyros: 1 to 10 deg/hour

Accelerometer: 200 :g

Digital Camera

Camera: High res 10-bit color

Pixel: 1280 x 1024

Digital data interface: Standard USB2.0 digital signal output

Lens: Specify desired field-of-view when ordering system

Alternate camera configurations available

Precision mounting baseplate:

Camera/IMU alignment < 500 mrad (with calibration)

1. Dependent on camera motion when data is taken
2. Object of interest must be large enough to be distinguished to one-pixel from image data.

GRIM Software

Features:

- Viewer for GI-Eye image data with built-in image enhancement
- Displays GI-Eye location in map format with image view overlaid on the projection
- GI-Locate algorithm for point-and-click computation of object locations from selected pixel coordinates

GI-Locate Performance¹

Relative location accuracy:

0.1-0.3 m (range to target<100 m)²

1 – 3 m (range to target<1000 m)²

Absolute location accuracy:

< 1 m (range to target< 1000 m with

DGPS option)²

Data export:

Access Database File format

Access report generation for GIS data interfaces

Requires: PC with Windows XP

GPS Receiver Characteristics

Acquisition Time:

Time to First Fix: 50 sec (cold start)

40 sec (warm start)

Differential GPS

Real-time DGPS receiver (Standard)

Direct broadcast from geostationary satellite transponder
Wide area differential GPS service precise positioning throughout the continental U.S. and much of Canada and Mexico

Nominal accuracy is 1 to 3 meters (1 sigma horizontal)

Post-test DGPS Reference Station (option)

OEM4 Performance Series Receiver

RTCM 104 Release 2.0 differential GPS output

Correction accuracy: 0.1 meter

Physical

Power: 9 to 18 VDC 50 watts max

Operational temperature: +10°C to +45°C

Storage temperature: -25°C to +60°C

Shock: 4.2 G

Vibration: 1.5 G

Approx. dimensions: 12"Hx12"Dx8"W

Weight: 25 lbs.

System customization:

Call for details on our customization services to facilitate GI-Eye integration and operation for your application

Calibration services:

Available for custom camera installation and alignment

NAVSYS Corporation

14960 Woodcarver Road

Colorado Springs, CO 80921

For more information call: (866-462-8797)

Or visit www.navsys.com