



MODEL 7005-HD (HIGH DEFINITION) EDGE/CENTROID/CORRELATION VMEBUS AUTOMATIC VIDEO TRACKER

The Model 7005-HD VMEbus Automatic Video Tracker (AVT) represents the latest tracker product in E-O Imaging's continued commitment to product innovation and improvement. The tracker provides the user a system easily adapted to a wide range of target and tracking environments. The single board tracker incorporates the latest in digital signal processing (DSP) and field programmable gate array (FPGA) technology providing a flexible architecture for customization. The tracker interfaces with both analog and digital video sources, providing ease in interfacing with a wide variety of sensor systems. The analog video interface provides full 12-bit, 4096 gray level capability supporting an array size up to 1024 x 1024. The HD video interface supports 720p, 720i, and 1080i and array sizes up to 2048 x 2048 with 20-bit resolution. The tracker design incorporates a multiple DSP implementation allowing concurrent operation of algorithms in realtime. The system is structured with an open architecture allowing easy incorporation of specialized features and algorithms. The Model 7005's standard features and options permit easy adaptation to even the most complex and demanding test range, tactical, surveillance and industrial applications.



Standard Features

- Selectable Edge, Mass/Intensity Centroid, Vector* and Correlation Algorithms
- Eight RS232/422 Serial Communication Ports
- VMEbus Slave Interface
- RS170 / RS170A / NTSC / PAL / CCIR / RS343
- Differential / Single-ended Video Analog Inputs (4), 12-bit Resolution
- Analog Video Outputs (3), 2 with Symbology and 1 Without
- HD-SDI (2) Inputs, 720p, 720i, 1080i, (1) Output With Symbology, (1) Output without Symbology
- Zoom Scaling/Correction
- Interlaced and Progressive Video Format Capability
- 2048 x 2048 Sensor Array Capability
- Analog Error Outputs, (2) 16-bit Resolution
- Analog Inputs (8), 16-bit Resolution
- Sophisticated Intrusion Detection and Recovery Algorithms
- Auto Acquisition and Target Detection
- Automatic/Manual/Gate Size and Position
- Adaptive and Manual Threshold Functions
- Robust Coast and Target Reacquisition Algorithms
- Advanced PID Servo Compensation Filter
- Embedded Motion Control Interface to Multiple 3rd Party Pedestal Vendors
- Stand-Alone Configuration (without VMEbus backplane)
 - VMEbus P2 and front panel connections
- Integrated Target Simulator
- User Text Annotation and Graphics
- Multiple frame and overlay buffers
- Multi-Target Capability

Typical Applications

- Weapon System Director
- Real Time Missile and Aircraft Tracking
- Simulator Systems
- Laser System Alignment
- ECM Evaluation
- Spatial Measurements of Objects
- Surveillance
- Biomedical Analysis
- Bomb and Weapons Scoring
- Weapon System Evaluation
- Re-entry Vehicle and Satellite Tracking
- Automated Calibration of Tracking Systems
- Image Matching
- Trajectory Analysis

Available Options

- Remote Control Unit
- Non Standard Video Formats
- Custom Packaging
- Custom Symbology and Annotation
- Custom Algorithms
- Trajectory Simulation Capability
- Operator Training Capability
- Image Stabilization
- Image Processor
 - Target Enhancement/Detection
 - User-definable Filter Characteristics
 - Stored Filters

* Vector Track mode is only available with mount position feedback.

MODEL 7005-HD

EDGE/CENTROID/CORRELATION VMEBUS AUTOMATIC VIDEO TRACKER SPECIFICATIONS

Electrical Interface

- **Composite Analog Video Inputs (4)**
 - Compatible with TV or FLIR 525/625
 - Video Std's RS170 / RS170A / NTSC / PAL / CCIR / RS343
 - Single-Ended or Differential, Switch Selectable
- **Composite Video Outputs (3)**
 - Two (2) mixed with symbology
 - One (1) with no symbology
- **HDSDI Interface**
 - Two (2) input channels
 - One (1) channel output with symbology
 - One (1) channel output without symbology
- **Analog Errors (2)**
 - Azimuth and Elevation Errors
- **Tracker Status Discretes (3)**
 - **On-Target Discrete:** indicates that target data is present and a valid track is active
 - **Coast Discrete:** indicates target has been lost and reacquisition sequence is in process
 - **Track/Acquire:** indicates track state
- **Digital Input/Output**
 - 16-bit bi-directional interface
- **Analog Input (8)**
 - Analog input ports +/- 10v max, 8 channels, 16-bit Resolution for Joystick, Zoom Position and Related Functions
- **Automatic Coast Mode**
 - Statistical Process determines the validity of the target
 - Optimal recovery from intrusions and disruption of track
- **Reticle**
 - Defines the AZ/EL null point of the system
 - User selectable reticle formats
- **Display Symbology**
 - Tracking Gate Outline (Window/Corners)
 - Reticle (Cross Hair)
 - Track Point Indicator (Flag/Cross Hair)
 - Offset Track Point
 - Threshold Enhancements (Highlighted Target Data)
 - Characters for displaying system status and mode information
 - Alphanumeric generator for user defined messages
- **Graphical User Interface**
 - PC based program for configuration setup and testing through the RS-232/422, VME or Ethernet interface
- **Built-In-Test**
 - Performs end-to-end testing
 - Verifies all track modes
- **Field Downloadable Software Updates (DSP/FPGA)**
- **Sophisticated PID Filter**
- **Configuration Save Capability**
 - Stores up to 10 user defined configurations in FLASH
 - Allows user to define Tracker boot-up configuration
- **Embedded Motion Control Processor**

Remote Control Input/Output

- **Serial Interface**
 - 115.2 K bit max. (default) - Software selectable RS232/422
- **VME Slave Interface (A24/D16)**
 - Base Address Selection: Switch Selectable (Upper 8 bits)
 - Supervisory or Non-Privileged
- **Gigabit Ethernet Interface**
 - Auto-negotiating 10/100/1000 Ethernet interface

Functionality

- **Tracking Algorithms**
 - Mass Centroid: Integrating (true centroid)
 - Intensity Centroid
 - Selectable Edge (top, bottom, left, right)
 - Correlation (Exhaustive Search)
 - Vector (Leading Edge) Track*
- **Tracking Gate Auto/Manual Size**
 - **Manual:** adjustable from 1% to 90% of the field of view area in Edge and Centroid Modes
 - **Adaptive:** automatically adjusts to variations in target size
 - **Correlation Mode:** Reference area size from 8 x 8 up to 32 x 32 elements, independent horizontal and vertical size controls. Search area is 64 x 64 pixels/line.
- **Threshold (automatic/manual)**
 - Allows identification of White and/or Black contrast targets or target gray levels
 - Automatic multigray level detection

Physical Specifications

- **Board Dimension**
 - Double Euro (6U) VMEbus Format, 160mm
- **Environmental**
 - Operating Temperature Range
 - Commercial units: 0 to + 70°C
 - Ruggedized units: -40 to + 85°C
 - Storage Commercial or Ruggedized: -45 to +85°C
- **Cooling Commercial or Ruggedized Units:**
 - Forced Air Cooling per IEEE Standard 1014-1987
- **Cooling Ruggedized Units:**
 - Conduction Cooling per IEEE Standard 1101.2-1992
- **Relative Humidity**
 - Commercial Units: 0 to 95% non-condensating
 - Ruggedized Units: 0 to 95% non-condensating



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* Vector Track mode is only available with mount position feedback.

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