

Core module

ADEPT5000

High performance multi-target video tracker

Features

- Radically new video architecture
- Advanced signature-based pre-processor for rejecting clutter
- Multi-target track engine
- High definition and digital sensor support
- Minimized operator workload
- Reduced integration time
- Rugged embedded design available in standard and custom form factors
- Low size, weight and power for use in turrets and unmanned vehicles
- Feature co-processor for advanced symbology and system management
- Upgrade path for new features and performance enhancements

The ADEPT5000 is a new generation multi-target video tracker that greatly extends tracking performance in a size weight and power optimized package. Over two decades of video tracking experience has been distilled to make it the ideal choice for both end-user and system integrator.

New advanced pre-processors with enhanced discrimination of targets from background clutter and new multiple target track software with concurrent multi-target detection, cueing and tracking combine to offer outstanding performance in challenging tactical scenarios.

The increased bandwidth of high definition video sensors introduces a major processing overhead for traditional systems. The dedicated video architecture of the ADEPT5000 ensures that higher pixel densities, frame rates and multiple targets can be processed with minimal latency making it the perfect choice for

closed-loop control applications. A wide range of high bandwidth digital video interfaces are available including full high definition video.

The ADEPT5000 has a simplified structured approach and automatic configuration functions to reduce integration time and complexity with a consequential cost saving. A comprehensive range of physical form factors are available with a common functional core, allowing a single integration process to be used for multiple system designs.

Careful consideration has been given to automating operation. The enhanced user interface, automated functions and advanced high resolution full color symbology combine to significantly reduce operator workload, monitoring and tracking targets reliably with minimal operator interaction.



The ADEPT5000 reliably detects and tracks challenging targets



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Performance

The ADEPT5000 automatic video tracker has been optimized to perform real-time target detection and tracking across the full range of military electro-optical system applications. Whether integrated in air-to-ground, ground-to-ground, ground-to-air or naval electro-optical systems, the new improved algorithms at the heart of the ADEPT5000 provide effective detection and tracking against the full spectrum of targets.

Discriminating targets at longer ranges is aided by a number of factors that include improved optics, precision platform dynamics and higher resolution sensors. The ADEPT5000 natively supports high definition video, whether infrared or visible spectrum, arriving via a selection of the latest digital interfaces.

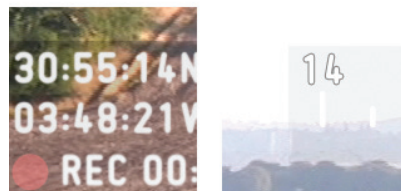
The instant these signals have been acquired, advanced pre-processors discriminate both stationary and moving targets from heavy clutter, mist, dust and other atmospheric challenges. The resulting signals are passed to sophisticated algorithms for track path analysis, optimized for particular operational scenarios.

The new multi-target track manager is designed to be resilient where targets utilize ground features to obscure the line of sight or deploy decoys to seduce tracking systems. It distinguishes situations where numerous targets undertake coordinated evasive maneuvers, handling crossing and temporarily obscured targets. It provides the ability for the operator to determine target priority.

The ADEPT5000's high performance video capabilities are not limited to analysis of sensor signals. An optional feature co-processor can be provided that enables advanced graphical overlays. This uses an open interface, making it easy to master graphics and menus on a PC, using off-the-shelf tools. Powerful color graphics rendering and compositing hardware supports flexible and clear outputs.



High performance discrimination of targets from ground clutter

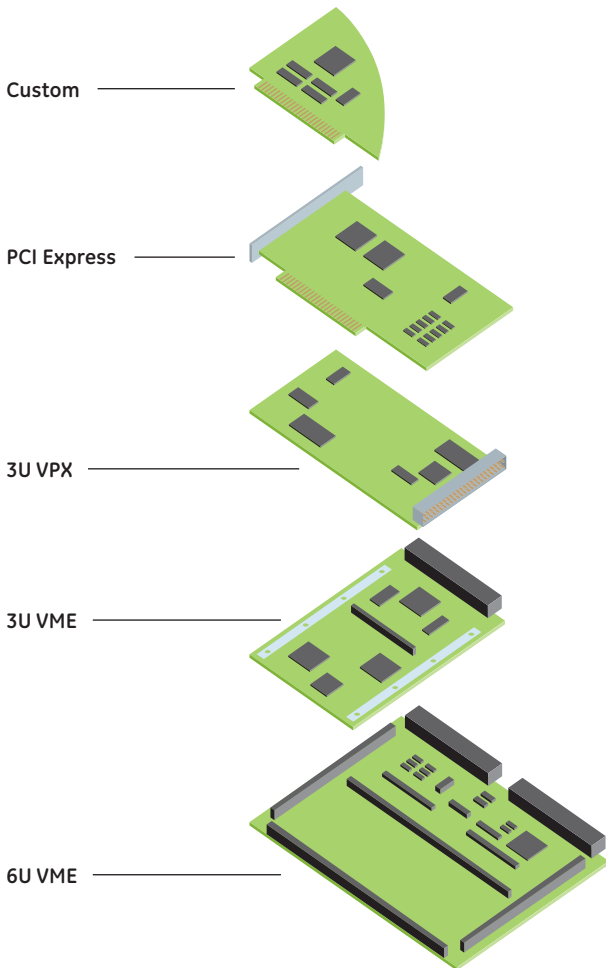


Easily programmed custom symbology and graphics overlays

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Ease of operation

Improved processing power and algorithms allow the ADEPT5000 to take more decisions itself. A range of automated functions are built in to reduce operational complexity and reduce operator workload, offering significant advantages, especially when eliminating dependence upon manual dexterity and hand-eye coordination under high stress conditions.



The ADEPT5000 is available in a wide range of form factors and as single integrated boards depending on options required and volumes

Integration

The combination of small size and low power consumption provide the performance of a multi-board tracker in a SWaP optimized module. This simplifies cooling requirements allowing the unit to be fitted into compact systems such as airborne pod applications. Here the drive is to integrate all system electronics into the gimbal assembly thereby removing the requirement for separate electronics assemblies.

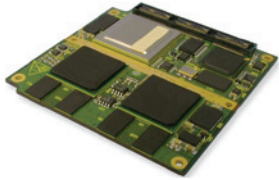
System integration can be a major factor in overall system cost. The ADEPT5000 uses a simplified structured approach to reduce integration time and complexity with features such as sensor format auto-detection, fast-start application modes and context-based settings combining to reduce integration cost.

The ADEPT5000 is available in a wide range of form factors employing the same functional core; enabling a single integration process to be used for multiple applications with differing demands on the hardware architecture. Optional hardware features and video and communication interfaces are called up to meet customer needs.

Forced-air or conduction cooling variants are available, depending on selected form factor.

A 6U VME development kit containing all the interface options is available for integrators, together with comprehensive documentation, quick-start guides and pre-defined scenarios.

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**ADEPT 5000 SERIES
INTEGRATOR'S TOOLKIT**

Select the required manual by clicking one of the entries in the following list:

- [ADEPT 5000 Series Start Here Guide](#)
- [ADEPT 5000 Series User Manual](#)
- [ADEPT 5000 Series Reference Guide](#)

For more documentation click any of the following links:

- [ADEPT 5000 SERIES REFERENCE MANUALS](#)

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Specifications

Detection and Cueing

- New track manager provides true concurrent multi-target detection, cueing and tracking
- Cueing algorithm: automatic or manual selection
- Cue Window: automatic or user defined

Target Tracking

- Clutter rejection: advanced signature-based pre-processor
- Multiple concurrent target tracks
- Multiple algorithms applied to a single target
- Scene tracking

Breaklock/Coast

- Automatic track-loss detection and re-acquisition
- Automatic track through sensor/field of view change

Loop Closure

- Loop closure source: any cued target
- On-the-fly switching between closed loop target sources

Platform Control

- Configurable 2-axis PID filters with rate or position demand output

Boresight

- Dual stage movable offset tracking

Electrical Interface

Video Inputs

- Analog: CCIR, PAL or RS170, NTSC
- Digital: DVI, CameraLink, HDSOI, GigE Vision

Video Outputs

- Analog: follows analog video
- Digital: follows digital input
- Scan/format conversion to DVI for GigE Vision and CameraLink inputs

Control Interfaces

- Serial Interfaces: RS232, RS422, USB
- Network: Ethernet
- Host: PCI or VME as appropriate

Extended Functionality (Optional)

Advanced symbology

- Full color with transparency
- Open standard PC symbology creation
- Programmable system processing engine running Linux operating system

Power Requirements

- 20-35W (depending on form factor and options)

Mechanical

(Core module)

- Weight: 53.7g
- Dimensions: 84 x 83 x 4.26mm

Form Factors

- PCI Express
- 3U VME
- 6U VME
- 3U VPX
- Custom

Environmental

Specification dependant on form factor and mounting. Maximum ratings are provided below.

Conduction: Level 5

- Humidity: 95%, 10 cycles, 240 hrs
- Operating Temperature: -40°C to +85°C at the thermal interface
- Vibration: MIL-STD-810E Fig 514.4
- Shock: 40g peak sawtooth, 11ms

Convection: Level 3

- Humidity: 95%, 10 cycles, 240 hrs
- Operating Temperature: -40°C to +75°C at 600ft/min airflow
- Vibration: MIL-STD-810E Fig 514.4
- Shock: 20g peak sawtooth, 11ms

About GE Intelligent Platforms

GE Intelligent Platforms, a General Electric Company (NYSE: GE), is an experienced high-performance technology company and a global provider of hardware, software, services, and expertise in automation and embedded computing. We offer a unique foundation of agile, advanced and ultra-reliable technology that provides customers a sustainable advantage in the industries they serve, including energy, water, consumer packaged goods, government and defense, and telecommunications. GE Intelligent Platforms is a worldwide company headquartered in Charlottesville, VA and is part of GE Home and Business Solutions. For more information, visit www.ge-ip.com.

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