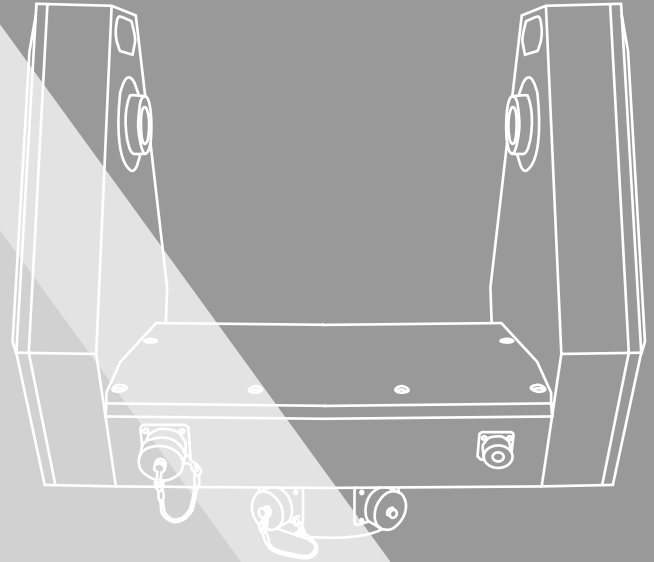


# RUGGED VECTOR 65

Precision Pan-Tilt System



CONTROL SYSTEMS

PAN-TILT SYSTEMS



General Dynamics Ordnance and Tactical Systems' precision pan and tilt systems combine our high power DC brushless motors and high accuracy resolvers directly coupled to the payload for maintenance-free operation with zero backlash. With a payload capacity of up to 65 pounds, the Rugged Vector-65 is ideally suited for multi-sensor platforms in shock and vibration applications. The integrated 16 bit resolver is directly coupled to each axis for superior control and accuracy, making it ideal for long-range electro-optical and infrared camera systems.

Built-in control electronics and software provide precise, smooth motion at all speeds. An integrated Gigabit Ethernet slip ring provides continuous rotation in the pan axis. The Rugged Vector-65 is also available with optional inertialgyro-stabilization, making it ideal for applications requiring dynamic position control.

General Dynamics Ordnance and Tactical Systems designs and manufactures a full portfolio of high-performance camera systems and components that provide our customers the clarity, accuracy, and reliability to successfully complete their mission.

Leveraging our custom motor and resolver technologies, we design and manufacture maintenance-free, precision pan-tilt systems with zero backlash and lower total cost of ownership.

## FEATURES

- » Designed for shock and vibration applications such as land vehicle or marine use
- » Direct drive technology provides maintenance-free operation with zero backlash
- » High resolution and precision allow for long-range pointing accuracy and stability
- » Precise and smooth operation at all speeds
- » Lower cost of ownership due to high reliability and maintenance-free operation
- » Versatile multi-sensor payload configurations
- » Slip ring with Gigabit Ethernet capability for high data throughput
- » Updated control electronics and software
- » Field programmable software
- » Elapsed-Time Clock measures run-time hours
- » Internal system diagnostics
- » Large tilt angle range
- » Wide operating voltage range
- » Marine rated: All external fasteners are 316 stainless steel

## SYSTEM SPECIFICATIONS

Operating Voltage	18-56 VDC
Operating Temperature	-40°C to +70°C (-40°F to +158°F)
Pan Speed	0.01 to 360°/sec
Pan Angle	360° Continuous
Tilt Speed	0.01 to 300°/sec
Tilt Angle	±90°
Resolution	0.005°
Position Repeatability	±0.01°
Position Accuracy	±0.1°
Backlash	None
Payload Weight Capacity	15 to 65lbs
Continuous Torque Pan	1150oz-in
Continuous Torque Tilt	2500oz-in
Pan-Tilt Weight	60lbs (27.2 kg)
Environmentally and EMI Sealed	IP67

## CONTROL SPECIFICATIONS

RS-232

Proprietary motion control algorithm developed specifically for Pan and Tilt systems

Predictive control loop based on a single adjustment for servo tuning greatly simplifies optimization for different payloads

Hardware and software control of position, speed, and acceleration at all times

Trapezoidal speed profile virtually eliminates overshoot at commanded position

**BENEFITS**

- » Survives heavy-duty use and abuse, typical of land vehicles in off-road conditions
- » No need to dismount system during vehicle operation or transit
- » Capable of mobile operation on watercraft of any size, in any sea state
- » Capable of carrying payload weight up to 65lbs
- » Better compatibility with different payloads for easier integration and servo loop tuning for optimal motion performance
- » Allows camera/radar image data to be passed through without compression or loss while still allowing 360 degree continuous rotation
- » Faster processor allows for enhanced controls to optimize integration/customization for different applications
- » Shortens time to market while increasing capabilities
- » Allows upgrades to be pushed to fielded applications without returning the systems to the factory
- » Track usage hours for reporting and/or for planning upgrades
- » Monitors health and status of system while providing BIT (Built-In-Test) for improved troubleshooting and diagnostics

**CONFIGURATION OPTIONS**

Gyro-Stabilization: 2-Axis Pan and Tilt

Finishes: Desert Sand polyurethane paint (standard), white, black, and other custom colors and finishes available upon request

**GYRO-STABILIZATION SPECIFICATIONS**

Payload orientation is inertially stabilized in two axes to compensate large-amplitude, low-frequency disturbances, such as a rocking ship or land vehicle motions.

Higher frequency disturbances can be stabilized with electronic stabilization of imaging system.

Multiple gyro modes to optimize performance for application requirements.