



Precision Systems  
**PAN & TILT UNITS**

**instro** 

Leading supplier and system integrators of  
military and commercial electro-optical sensors

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Instro's foundation dates back to 1964 when, from its inception, it started working for the UK MoD as a precision engineering contract manufacturer.

Today, that heritage of reliable precision engineering and robust design is at the heart of our products which are fielded successfully and used extensively in more than 50 countries, globally.

Instro manufactures, supplies and supports an extensive range of cutting-edge precision technology to end users and OEMs as part of a larger system and offers a comprehensive capability as a prime supplier.

Our core products demand intricate manufacturing and production skills, ensuring a quality product you can rely on every time.

Our approach to Continuous Improvement means that we don't just settle for the status quo, but instead we challenge the norm and always strive to improve.



## Customer Testimonials

*"We spent significant time and resource scanning the market for mounting solutions which met our needs before finding Instro. Our users had a keen focus: low weight, with precision pointing and high stability - especially in high winds. Instro's Medium Duty Tripod and Maxi Fine Adjust delivered exactly that."*

Communications System Provider

*"With an exceptionally low size, weight and power envelope - Hornet has proven itself as a reliable, high precision and readily man portable motorised pan and tilt unit for our hand-held thermal imagers."*

Defence Client

# Instro's Pan & Tilt Range

Our range of high performance Pan & Tilt Head products can be found in operation around the globe.

Expertly designed with the end user in mind, they combine ease and speed of use, with accurate alignment and maximum stability for optimum deployment at critical moments.

Our rugged motorised products can position payloads of up to 100kg with great precision, allowing effective surveillance of objects at distances of many kilometres away.

They also offer full environmental protection from the elements (IP67-where applicable), meaning our Pan & Tilt Heads can remain operational in a wide variety of challenging environments, from the desert to the Arctic.



# Mini Pan & Tilt

## Ultra Lightweight Manual Pan & Tilt Head

### Key Features

 Payload Capacity 10kg



### Product Benefits

- 10kg nominal payload capacity
- Rugged lightweight and compact
- Designed for ease and speed of deployment
- Independent brakes for pan and tilt
- Payload quick-release mechanism
- Standard 5/8" 11 UNC tripod mount
- Full +/- 45° tilt range
- Digital Magnet Compass Compatible
- Expandable – Payload adapters are available to suit most payloads
- Versatile – payload and mounting interfaces common to Instro's Thor range of goniometers and Hornet range of motorised pan and tilts

### Specifications

Specifications	Mini Pan & Tilt
Construction	Aluminium construction with a tough black anodised and paint finish
Payload capacity	10kg (22lbs)
Dimensions (H/W/D)	95mm x 100mm x 103mm (3.7" x 3.9" x 4.1")
Weight	0.5kg (1.1lbs)
Payload interface (mechanical)	Thumb operated quick release requiring compatible payload adapter
Elevation Range	±45°
Azimuth Range	Unrestricted, ±360° full circle
Axis brakes	Independent on both axis
Mounting interface	Standard Instro tripod interface with 5/8" -11 UNC female drawbolt thread
Operating temp. range	-33°C to +55°C

### Applications

- Thermal/night vision equipment support
- Multi-function binocular support
- Laser rangefinder/designator support
- Telescope and binocular support
- Communications antenna support
- Scientific instrument support e.g. weather or CBRN monitoring equipment

### Options

- Removable steering handle
- Custom payload adapter assemblies

### Accessories

- Generic interface adapters
- Dual payload adapter
- Carry bags
- Matching lightweight tripods
- Custom adapter assemblies






Mini Pan & Tilt Head

# Mini Pan & Tilt Fine Adjust

## Lightweight Manual Pan & Tilt Fine Adjust Head

### Key Features

-  Payload Capacity 10kg
-  IP67 Environmentally Sealed
-  Level Bubble



### Product Benefits

- Rugged lightweight and compact design
- Designed for ease and speed of deployment
- Viscous damping
- Fine adjust mechanism
- Independent braking action
- Circular level bubble
- Elevation scale
- Payload quick release mechanism
- Standard 5/8" 11 UNC tripod mount
- Full +/- 45° tilt range
- Digital Magnet Compass Compatible
- Environmentally sealed (IP67)
- Three standard payload interface options available

### Specifications

Specifications	Mini P&T Fine Adjust
Payload capacity	10kg (2.2lbs)
Dimensions (H/W/D)	109mm x 173mm x 130mm (4.3" x 6.8" x 5.1")
Weight	1.2kg (2.6lbs)
Payload interface (mechanical)	Thumb operated quick release requiring compatible payload adapter
Elevation Range	±45°
Azimuth Range	Unrestricted, ±360° full circle
Axis brakes	Independent braking action on coarse range of motion
Mounting interface	Standard Instro tripod interface with 5/8" -11 UNC female drawbolt thread
Operating temp. range	-33°C to +55°C
Tilt fine adjust range of motion	±1.13°
Pan fine adjust range of motion	±2.5°
Axis damping	Yes viscous in both pan & tilt

### Applications

- Thermal/night vision equipment support
- Multifunction binocular support
- Laser rangefinder/designator support
- Telescope and binocular support
- Communications antenna support
- Scientific instrument support

### Options

- Removable steering handle
- Custom payload adapter assemblies

### Accessories

- Generic interface adapters
- Dual payload adapter
- Carry bags
- Matching lightweight tripods
- Custom adapter assemblies






Mini Pan & Tilt Fine Adjust Head

# Maxi Pan & Tilt Fine Adjust

## Heavy Duty Manual Pan & Tilt Head

### Key Features

-  Payload Capacity 25kg
-  IP67 Environmentally Sealed
-  Level Bubble



### Product Benefits

- Rugged and durable
- Easy to use and deploy
- Backlash free fine drive mechanism
- Selectable azimuth drive engagement
- Mechanical scales
- Level bubble to aid deployment
- Precision payload interface
- Environmentally sealed (IP67)

### Specifications

	Maxi P&T Fine Adjust
Construction	Aluminium construction with tough black anodised external surfaces and payload interface. Fine adjust control knobs feature tactile silicone rubber covers
Payload capacity	25kg (55lbs)
Dimensions (H/W/D)	182mm x 236mm x 176mm (7.2" x 9.3" x 6.9")
Weight	5kg (11lbs)
Payload interface (mechanical)	Application specific wedge style adapter
Elevation Range	±30°
Azimuth Range	Unrestricted, ±360° full circle
Mounting interface	Standard Instro tripod interface with 5/8" -11 UNC male drawbolt thread
Operating temp. range	-33°C to +71°C

### Applications

- Thermal camera and night vision equipment
- Laser range finder or designator
- Telescope and binocular
- Surveillance, video and still camera
- Radar and communication antenna
- Scientific instrument support
- Tripod mountable

### Options

- Removable steering handle
- Custom payload adapter assemblies

### Accessories

- Generic interface adapters
- Dual payload adapter
- Carry bags
- Matching lightweight tripods






Maxi Pan & Tilt Fine Adjust Head

# Hornet

## Lightweight High Performance Motorised Pan & Tilt Head

### Key Features

-  Payload Capacity 7kg
-  IP67 Environmentally Sealed
-  Level Bubble



### Product Benefits

- Suited to man-portable surveillance application
- Lightweight and compact
- Rugged design
- Level bubble to aid deployment
- Environmentally sealed (IP67)
- High pointing accuracy
- RS422 communications
- Precise speed control
- Fast axis speed (10°/s) version available
- Highly resistant to shock and vibration
- Quick release payload interface
- Built-in tripod interface

### Specifications

Specifications	Hornet
Payload capacity	7kg (15.4lbs)
Dimensions (H/W/D)	123mm x 153mm x 192mm (4.8" x 6.2" x 7.6")
Weight	2.15kg (4.75lbs)
Elevation Range	±45°
Azimuth Range	Unrestricted, ±360° full circle*
Max Velocity	2.25°/s or 10°/s
Accuracy	0.056° 1σ
Operating Voltage	12 - 24 VDC
Communications	Ethernet or RS422
Torque	4.5Nm

\*Subject to cable wrap

### Applications

- Mobile border surveillance
- Tripod mounted observation posts
- Customs and police applications
- Environmental applications
- Industrial security
- Security and perimeter surveillance

### Options

- Maritime colour and sealing
- Customer-tailored remote control consoles and system cabling
- Customer-specific mounting brackets
- Customer-specific paint colour

### Accessories

- Starter kits consisting of power/comms cable and basic PC-based controller application
- Hardware controller with monitor and digital video recorder
- Matching tripod
- Quick release payload adaptors







Hornet Motorised Pan & Tilt Head

# D1

## Lightweight, High Performance Motorised Pan & Tilt Head

### Key Features

-  Payload Capacity 15kg
-  IP67 Environmentally Sealed
-  Safety Cutout
-  Level Bubble



### Product Benefits

- Versatile pan & tilt unit for a wide range of payload configurations and applications
- Man-portable
- Quick release payload interface
- Slipping for continuous rotation
- Rugged compact design
- Environmentally sealed (IP67)
- Payload support for 1000Base-T Gigabit Ethernet
- Ethernet / RS422 control
- Precise speed control
- High accuracy, high axis speed (50°/s)
- Highly resistant to shock and vibration

### Specifications

	D1
Payload capacity	15kg (33lbs)
Dimensions (H/W/D)	247mm x 136mm x 225mm (9.7" x 5.4" x 8.9")
Weight	4.5kg (9.9lbs)
Elevation Range	±45°
Azimuth Range	Unrestricted, ±360° full circle
Max Velocity	25°/s or 10°/s*
Accuracy	0.056° 1σ
Operating Voltage	18 - 32 VDC
Communications	Ethernet / RS422 / Analogue video / Gigabit 1000Base-T
Operating temp range	-32°C to +71°C

\*Application specific

### Applications

- Man-portable surveillance applications
- Tripod-mounted observation posts
- Customs and border police
- Industrial security
- Security and perimeter defence
- Communications antenna alignment

### Options

- Bespoke payload bracket design service
- Customer-specific paint colour

### Accessories

- PC based control software and cables
- Hardware controller with monitor and digital video recorder
- Tripod mount adaptor
- Matching tripods for ground deployment
- Quick release payload adaptors







D1 Motorised Pan & Tilt Head



# D2

## High Performance Stabilised Motorised Pan & Tilt Head

### Key Features

-  Payload Capacity 15/25kg
-  IP67 Environmentally Sealed
-  Safety Cutout
-  Fail Safe Brake



### Product Benefits

- Rugged compact pan & tilt positioner/director
- 2x 1000Base-T payload IP streaming connections
- Up to 4 analogue video channels
- Ethernet and serial control
- Controllable speed 0.1mil/Sec to 100deg/Sec
- Continuous 360° pan operation with slip ring
- ±90 Degree tilt range
- 1 Mil positioning accuracy and repeatability
- Environmentally sealed (IP67)

### Specifications

	D2
Payload capacity	15kg (33lbs) Top 25kg (55lbs) Pannier
Dimensions (H/W/D)	341mm x 320mm x 207mm (13.4" x 12.6" x 8.1")
Weight	15kg (33lbs)
Elevation Range	±90°
Azimuth Range	Unrestricted, ±360° full circle
Max Velocity	100°/s
Accuracy	0.056° 1σ
Operating Voltage	18 - 32 VDC
Communications	Ethernet / RS422 / Analogue video / Gigabit 1000Base-T
Operating temp range	-32°C to +71°C

### Configurations

D2 can be configured to handle a wide range of sensors and sensor suites for long-range precision surveillance with typical payloads including thermal imagers and day/night cameras. Using an adapter, the D2 may also be used with the Groundmaster for tripod-mounted applications.

The D2 supports the latest digital video and communications via 1000Base-T Gigabit Ethernet making it particularly suitable for extended border control and surveillance consisting of multiple installations controlled over IP.

### Applications

- Mast-mounted surveillance cameras
- Fast patrol boats
- Heavy vehicle vision aids and systems
- Port and shipping surveillance systems
- Customs, coastguard and police vessels
- Security and perimeter defence

### Options

- 2 Axis gyro stabilisation
- Built-in auto tracker
- Built-in digital image stabilisation
- Marine-grade environment protection
- Alternative payload interfaces
- Customer-specified colour

### Accessories

- Starter kit for developers including system cables and Windows controller application
- Tripod mount adaptor
- Matching tripod
- Quick release payload adaptors







D2 Motorised Pan & Tilt Head

# Wasp

## High Performance Motorised Pan & Tilt Head

### Key Features

-  Payload Capacity 30kg
-  IP67 Environmentally Sealed
-  Safety Cutout
-  Fail Safe Brake



### Product Benefits

- Modular unit, adaptable to suit a wide range of payload configurations and mid/long range applications
- Azimuth slipping as standard
- Rugged compact design
- Environmentally sealed (IP67)
- Payload support for 1000Base-T Gigabit Ethernet
- Ethernet or RS422 communications
- Precise speed control
- Highly resistant to shock and vibration

### Specifications

Specifications	Wasp
Payload capacity	30kg (66.1lbs)*
Dimensions (H/W/D)	424mm x 302mm x 166mm (16.7" x 11.9" x 6.5") L 424mm x 462mm x 166mm (16.7" x 18.2" x 6.5") U
Weight	12kg or 16.5kg (26.4lbs or 36.4lbs)
Elevation Range	±90°
Azimuth Range	Unrestricted, ±360° full circle
Max Velocity	60°/s
Accuracy	0.056° 1σ
Operating Voltage	20 - 32 VDC
Communications	Ethernet or RS422
Torque	20Nm
Operating temp. range	-32°C to +71°C

\*Configuration dependent

### Configurations

The Wasp is available in the compact 'L' configuration and 'U' configuration with support arm and optional spacers tailored to payload width, enabling payload capacity to be increased, as well as balanced for better performance.

#### Applications

- Fixed and mobile border surveillance
- Coastal surveillance
- Port and shipping control
- Maritime, Customs and coastguard applications
- Vehicle mounted applications
- Security and perimeter defence
- Auto tracking applications
- Line of sight stabilisation

#### Options

- Gyro stabilisation
- Automatic video tracker
- Maritime environmental protection
- Support arm spacers
- Bespoke payload bracket design service
- Customer specific paint colour

#### Accessories

- PC based control software and cables
- Hardware controller with monitor and digital video recorder
- Tripod mount adaptor
- Matching tripod
- Quick release payload adaptors



'L' Configuration







'U' Configuration

# Mantis

## High Performance Heavy Duty Motorised Pan & Tilt Head

### Key Features

-  Payload Capacity 100kg
-  IP67 Environmentally Sealed
-  Safety Cutout
-  Fail Safe Brake



### Product Benefits

- High payload capacity pan and tilt
- Azimuth slipping as standard supporting payload power, fast and Gigabit Ethernet, serial communications and analogue video
- Ethernet or RS422 communications
- Rugged design
- Environmentally sealed (IP67)
- Precise speed control
- Highly resistant to shock and vibration
- Payload support for 1000Base-T Gigabit Ethernet

### Specifications

Specifications	Mantis
Payload capacity	100kg (220lbs)*
Dimensions (H/W/D)	593mm x 406mm x 253mm (23.3" x 16" x 20.6") L 593mm x 549mm x 253mm (23.3" x 21.6" x 20.6") U
Weight	26kg or 31kg (57.3lbs or 68.3lbs)
Elevation Range	±90°
Azimuth Range	Unrestricted, ±360° full circle
Max Velocity	50°/s
Accuracy	0.056° 1σ
Operating Voltage	20 - 32 VDC
Communications	Ethernet or RS422
Torque	100Nm
Operating temp range	-32°C to +71°C

\*Configuration dependent

### Configurations

The Mantis is available in two standard versions, the basic 'L' configuration and the 'U' configuration with a support arm for heavier payloads or higher shock and vibration environments.

The capabilities of the Mantis can be further extended with the addition of factory-configured options such as gyro stabilisation and the use of support arm spacers to achieve optimum payload mass distribution.

### Applications

- Fixed and mobile border surveillance
- Coastal surveillance
- Port and shipping control
- Customs and Coastguard
- Vehicle mounted surveillance
- Maritime applications
- Security and perimeter surveillance



'L' Configuration

### Options

- Maritime environmental protection
- Automatic video tracker
- Gyro stabilisation
- Support arm spacers
- Customer tailored remote control consoles and cabling
- Customer specific payload mounting adaptors
- Customer specific paint colour



'U' Configuration

instro



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