



DATA SHEET

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GONIOMETER, DIGITAL – THOR SERIES

1. DESCRIPTION

The THOR high performance digital goniometer is ideal for use with the latest generation of multifunction surveillance and target acquisition products. The unit is robust yet compact and when used in conjunction with a suitable tripod such as the Instro TriLite provides a stable platform for accurate results under all environmental conditions.

THOR features high resolution encoders and selectable fine adjustment drives on both axis for highly accurate target acquisition. As an option, the elevation axis can be configured with a smooth counterbalance action to support larger payloads including for example, a co-mounted thermal imager and laser designator / rangefinder combinations. Counterbalance mechanisms may be simply disabled by rotation of an external control on the unit. This ensures suitability for users who may wish to operate with a number of different sensor combinations.

THOR is much more than just a pan and tilt head and provides accurate angle data in digital form to the connected sensor or handheld computer for use in higher level computations. The THOR uses very little power which can be derived from an external power source or from the mounted sensor for convenience.

Digital data is transferred conventionally via wire or if a cable-less solution is desired via Instro's optional quick release SMART interface which automatically identifies the mounted payload device and configures connectivity to suit.

THOR is a very flexible device that can be used with both multifunction and more basic laser range finding products. When used to support a multifunction target acquisition product THOR provides extremely accurate polar target data (azimuth and vertical angle target data). This is combined with own position and north orientation data from the mounted sensor to determine target co-ordinates.

When used with a laser range finder or designator that does not feature target computation capability, the capabilities of THOR can be further extended by the addition of the Digital Magnetic Compass and 'FIRE' button options. For target coordinate computation and fire control tasks THOR may complimented with the optional rugged computing device (TCD) featuring full function configurable targetting application software.

Thor is of robust construction and manufactured from suitably specified materials selected for their light weight, durability and low magnetic signature. The aluminium main casing is finished in a NATO green colour (Non IRR). Other parts are either black painted, black anodised or chemically black finished. All finishes are matt non reflective. Other finishes are available as options.

THOR features a common tripod interface with 5/8" – 11UNC female drawbolt thread compatible with all Instro tripods. A precision quick release payload interface mechanism is provided purposely designed for repeatability, sensor security and ease of deployment.

Mechanical scales are provided in both azimuth and elevation as an backup method of determine line of sight angle while a circular level bubble is provided as an aid to deployment. Elevation range is a full $\pm 45^\circ$ (± 800 mils).

Typical THOR configuration

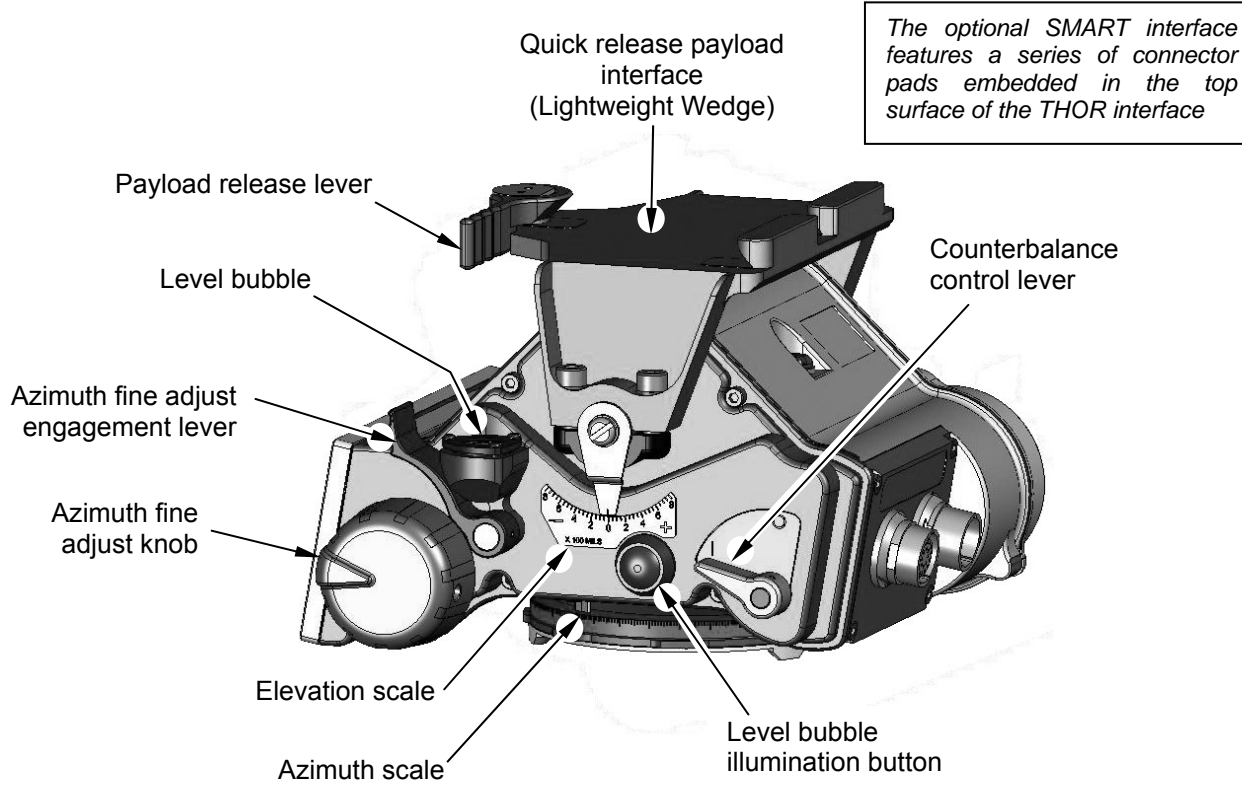


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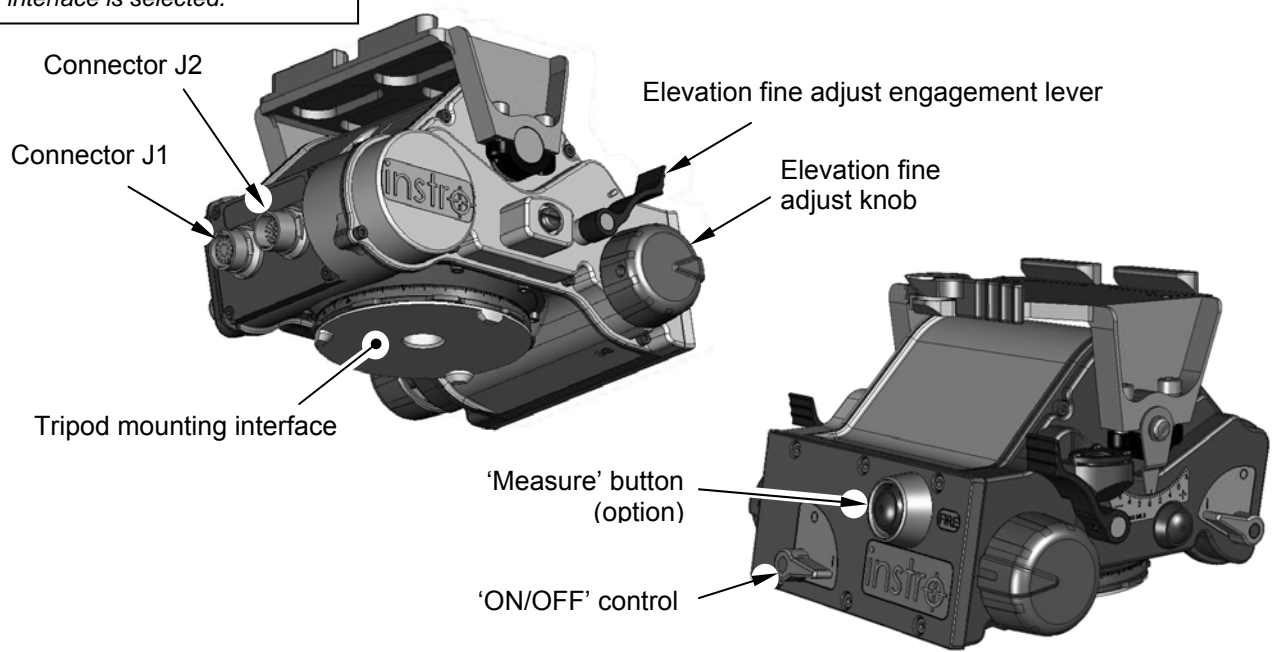


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Connectors J1 and J2 are not required if the optional SMART interface is selected.



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Key features and options

- Compact and very lightweight - truly man portable
- Rugged durable and easy to use, designed for ease and speed of deployment
- Line of sight fine adjust control in both azimuth and elevation
- Configurable to application
- Payload quick release interface
- Low power consumption, high accuracy & resolution
- Independent braking action for pan and tilt
- Circular level bubble plus backup mechanical scales
- DMC compatible
- Wide elevation range
- Environmentally sealed
- Payload counterbalance
- Optional Fire button
- Optional Digital magnetic compass
- Optional handheld targeting computer
- Optional SMART interface for cable-less connection



**THOR Control Device (TCD)
(Option)**

Applications

- Multifunctional binocular support
- Artillery fire control
- Forward air control
- Ground laser target designation
- Thermal and night vision equipment support
- Surveillance, video & still camera support
- Communications antenna support
- Scientific instrument support

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2. OUTLINE SPECIFICATION

Configuration ^{note1}	Conventional payload interface	Smart payload interface
Manufacturers part number	00-1190-9001	00-1190-9002
Weight (approx)	≤2.5kg (5.5lb)	
Payload capacity ^{note2}	12kg (26.4lbs) (with counterbalance mechanism on)	
Dimensions (approx)	W17.3cm (6.8") x H12.4 cm (4.9") x D17.8cm (7")	
Payload interface	Quick release interface requiring compatible sensor adapter	
Mounting interface	Standard Instro tripod interface with 5/8" – 11UNC female drawbolt thread	
Azimuth movement	Azimuth (pan): 360° (6400mils) continuous rotation	
Elevation movement	Elevation (tilt): ±45° (±800mils) With respect to the azimuth mounting plane	
Positional resolution	0.0056° (0.1mil) in both axis	
Positional accuracy	0.056° (1mil)1σ in both axis with respect to North reference	
Mechanical scales	Azimuth scale marked every 200mil (11.25°) with 20mil sub divisions (Re-settable to correspond to north orientation) Elevation scale marked every 200mil (11.25°) with 50mil sub divisions	
Braking action ^{note3}	Independent on both axis	
Fine adjust	The fine adjust mechanism is cyclic, offering a range of ±0.8436° (±15 mils) fine adjustment about a nominal mid position when braked	
Counterbalance springs	Yes (Can be selectively disengaged)	
Level bubble	Yes - To facilitate levelling to ±0.028° (0.5mils)	
Night time use	Level bubble is electrically illuminated (from external source)	
ON/OFF switch	Yes	
Power consumption	<3w	
Operating voltage Nominal (Limits)	12Vdc (6 – 32Vdc)	
Electrical connections	Two circular connectors for all connections (LEMO type)	Instro SMART interface
Communications	RS422	
Environmentally sealed	Yes	
Operating temperature	-32°C to 55°C	
Storage temperature	-40°C to + 71°C	
Construction	Aluminium alloy construction with other low magnetic materials. All parts are processed appropriately for intended operational environment	
Standard colour	Matt NATO green (NON IRR, other colours optional)	
Factory options		
➤ Digital magnetic compass (DMC) Ext	Can be configured to use the digital magnetic compass in the mounted sensor as a factory option	
➤ Remote fire button	A fire button can be added to enable remote firing of the supported sensor	

The above figures are provisional ratings and assume typical applications. Actual performance will depend on many parameters, including payload size, configuration and environmental conditions.

Note 1	Quick release payload interfaces- The Instro Lightweight Wedge and Smart interfaces are of a quick release type requiring compatible interface adapters (available separately).
Note 2	Payload Characteristics- Max torque induced by payload at full tilt to be ≤10Nm (88lb.f-in).
Note 3	Braking action – The efficiency of the braking action is sufficient to stabilise the payload whilst not held by the operator and is not intended as a firm mechanical brake resistant to deliberate effort. Braking action is accomplished by engagement of the respective fine adjust mechanism.

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