LAND DEFENSE AND SECURITY
INERTIAL NAVIGATION
Reliable navigation in all environmental and operational conditions is a key requirement for all modern land platforms to successfully carry out their missions in security.

Accurate pointing is also critical to improve efficiency of howitzers, radars, observation turrets or any system requiring true north accuracy.

Inertial Navigation Systems (INS) are therefore expected to deliver accurate real-time pointing and reliable navigational data whatever the conditions - notably in GNSS denied environments - thus greatly enhancing the platform resilience capabilities on the battlefield.

Industrial integrators need equipment that is not only reliable and cost-effective, but also easy to integrate, in order to reduce their non-recurring costs. Moreover, equipment acquisition is governed by the recurring demand on the part of land defense and security forces to minimize overall cost of ownership. Very high MTBF, scalability and interchangeability to adapt the vehicles and weapon systems equipment to the missions, as well as lifecycle cost reductions through commonalities, low-maintenance and obsolescence management, are all key criteria for systems targeted by modern armies.

iXblue has conceived a complete range of inertial systems to address the full spectrum of land applications. The Advans Series products are designed to respond to all the challenges raised by integrators and land forces: accuracy, efficiency, but also reliability, low cost of ownership and flexibility to adjust to all types of missions.

Up-to-date technology: iXblue systems leverage the most advanced and proven technologies across all applications for efficiency and consistency. Critical system components are all designed, developed and manufactured in house as a result of intensive internal investment in R&D. They are individually implemented once their technological maturity is fully demonstrated for land usage through intensive testing and trials.

Performance: iXblue systems performance is the result of years of high level R&D investment. Our aim is to design systems that not only meet the key performance requirements, but the whole set of critical and desirable requirements that make the systems perfectly suited to the most demanding land usage. We refuse to make technological compromises and strongly believe that the most capable systems are the result of innovation and a commitment to excellence.

High reliability and availability are iXblue trademarks. The unrivaled MTBF of iXblue’s FOG technology, far over 80,000 working hours, has set the pace for all other system developments. Reliability, together with the lowest level of preventive maintenance, are key principles that govern iXblue technical choices in systems design. In addition, iXblue offers a 24/7 technical support service worldwide to guarantee the highest level of system service for its customers.

Commonality, scalability, versality: iXblue offers scalable solutions for each type of platform. iXblue systems share strong commonalities with regards to hardware, software and interfaces. This results in significant savings in term of integration, installation, configuration management, logistics, training and maintenance costs. Furthermore, the implementation of open architectures, large protocol libraries and modular software make iXblue systems very versatile and easy to interface with all types of external systems.
Cost effective, the Advans Inertial Navigation Systems are highly reliable and do not require any periodic maintenance. They are ITAR-free, very compact, adaptable to all communication protocols and feature the same web-based user interface across all models, making them easy to integrate and operate.

All Advans products are based on the same architecture, using the same software and connectors, and are qualified versus the same environment. This results in perfect interchangeability, except for the mechanical interface, allowing for one single integration for a fleet of vehicles equipped with several variants. By investing both in the FOG and in MEMS technologies, iXblue provides a solution for each application.

Two technologies, one unique product range

Fiber-optic gyroscope
Advans products benefit from the advantages of FOG technology: reliability, absence of periodic maintenance, compactness, low power consumption. In addition, due to the legacy in civil markets, integration is rendered particularly easy with open protocols. Moreover, like for naval applications, there is no observed limitation of performance, meaning that the Advans Series will benefit from the optimization of the technology to improve the performance of higher-grade INUs and bring down cost and size for medium-grade INUs.

Micromachined electro-mechanical systems
Ursa 3 is a MEMS-based INU. It has been developed to meet the requirement of land and security forces to offer a simple, cost-effective INU. It uses the same interfaces as Ursa 5 and 7. MEMS technology is improving every year. The expected performance in terms of gyro bias is better than 1° per hour, whereas the FOG technology can be downscaled with reduced prices. The two technologies will not overlap but join.

Key benefits

- Low cost of ownership
- Solid state: high reliability
- MTBF > 80,000 h
- No periodic maintenance
- Easy to integrate
- Open protocols
- Very compact and light
- Low power consumption
- Growth potential
- FOG: No identified performance limitation
- MEMS: Technology of the future

INERTIAL NAVIGATION
Inertial navigation systems based on micro-electro-mechanical gyroscopes

**Proton**
COMPACT INS FOR CIVIL SECURITY FORCES

Based on the cutting-edge MEMS technology, Proton provides reliable and accurate navigation information and is easy to integrate and operate thanks to its intuitive user interface that displays all navigation information on a screen within the vehicle.

**Advans Ursa 3**
COMPACT INS FOR BLUE FORCE TRACKING

Based on the cutting-edge MEMS technology, Advans Ursa 3 provides 3D positioning, orientation and attitude to vehicles and/or weapons. It is able to provide and maintain accurate positioning during critical phases when previously aligned with GPS.

Inertial navigation system based on fiber-optic gyroscopes

**Advans Ursa**
HIGH-GRADE INS FOR BLUE FORCE TRACKING

Based on the FOG technology, Advans Ursa is a robust and maintenance-free system that provides highly accurate continuous positioning, heading and attitude information for tactical navigation. Blue force tracking, collaborative combat and light weapon systems, even in full GNSS denied environments.

**Advans Lyra**
HIGH-GRADE INS FOR TACTICAL VEHICLES

Based on the FOG technology, Advans Lyra is a middle grade INS offering a very good cost-performance ratio for weapon systems such as rocket launchers, light howitzers, mortars, radars and observation systems.

**Advans Vega**
HIGH-GRADE INS FOR ARTILLERY AND RADARS

Based on the FOG technology, Advans Vega is an inertial navigation system designed for military applications requiring mobility and high accuracy. It provides immediate and continuous navigation and pointing information for radars, topographic systems and artillery launchers. Howitzers and multiple rocket launchers.

**Advans Vega**
HIGH-GRADE INS FOR BLUE FORCE TRACKING

**Advans Lyra**
HIGH-GRADE INS FOR TACTICAL VEHICLES

**Advans Ursa**
HIGH-GRADE INS FOR BLUE FORCE TRACKING

**Proton**
COMPACT INS FOR CIVIL SECURITY FORCES
<table>
<thead>
<tr>
<th>Model</th>
<th>HORIZONTAL POSITION WITHOUT GNSS(^{(1)})</th>
<th>REAL TIME HEADING ACCURACY(^{(2)})</th>
<th>ROLL AND PITCH</th>
<th>ALIGNMENT(^{(3)})</th>
<th>FAST ALIGNMENT (STORED VALUES)</th>
<th>VOLUME (MM)</th>
<th>WEIGHT</th>
<th>POWER CONSUMPTION</th>
<th>OPTIONAL EXTERNAL GPS</th>
<th>VMS COMPATIBILITY</th>
<th>COMMUNICATION INPUT/OUTPUT</th>
<th>RELIABILITY</th>
<th>SHOCKS(^{(4)})</th>
<th>QUALIFICATION</th>
<th>OPERATING TEMPERATURE(^{(5)})</th>
<th>EXPORT CONTROL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proton</td>
<td>1.5% DT 30mn</td>
<td>6 mils with GNSS</td>
<td>4 mils</td>
<td>10mm typical</td>
<td>N/A</td>
<td>160x130x70</td>
<td>2.6 kg</td>
<td>&lt;10 W</td>
<td>Any GPS providing - Smart Mil Std C/A GNSS NMEA 0183</td>
<td>Bus Can or pulses</td>
<td>RS 232 / 422 / Ethernet - Web based interface for configuration</td>
<td>MTBF &gt; 80,000hrs - No moving parts - No periodic maintenance</td>
<td>N/A</td>
<td>Mil</td>
<td>MIL Std 810 C - 461 F - 1275 E - Waterproof IP67 - CE marking ROHS</td>
<td>Free of export</td>
</tr>
<tr>
<td>Ursa 3</td>
<td>1.5% DT 30mn</td>
<td>6 mils with GNSS</td>
<td>4 mils</td>
<td>10mm typical</td>
<td>N/A</td>
<td>160x160x100</td>
<td>2.6 kg</td>
<td>&lt;10 W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-32 ºC to +71 ºC</td>
<td>Free export</td>
</tr>
<tr>
<td>Ursa 5</td>
<td>1 % DT</td>
<td>6 mils</td>
<td>3 mils</td>
<td>10mm typical</td>
<td>N/A</td>
<td>165x100x136</td>
<td>4 kg</td>
<td>&lt;12 W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-32 ºC to +71 ºC</td>
<td>French export only</td>
</tr>
<tr>
<td>Ursa 7</td>
<td>0.7 % DT</td>
<td>4 mils</td>
<td>2 mils</td>
<td>10mm typical</td>
<td>N/A</td>
<td>165x100x136</td>
<td>4.5 kg</td>
<td>&lt;18 W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-32 ºC to +71 ºC</td>
<td>French export legislation applies - No ITAR restricted components</td>
</tr>
<tr>
<td>Lyra 5</td>
<td>0.5 % DT</td>
<td>2 mils</td>
<td>0.5 mils</td>
<td>10mm typical</td>
<td>Initial set up &lt;4mn - Fine Alignment 10mm typical</td>
<td>275x156x150</td>
<td>5 kg</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-45 ºC to +71 ºC</td>
<td></td>
</tr>
<tr>
<td>Lyra 7</td>
<td>0.5 % DT</td>
<td>0.5 mils</td>
<td>0.5 mils</td>
<td>10mm typical</td>
<td>Initial set up &lt;4mn - Fine Alignment 10mm typical</td>
<td>275x156x150</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-45 ºC to +71 ºC</td>
<td></td>
</tr>
<tr>
<td>Vega 5</td>
<td>0.1 % DT</td>
<td>0.3 % DT</td>
<td>0.1 % DT</td>
<td>10mm typical</td>
<td>Initial set up &lt;4mn - Fine Alignment 10mm typical</td>
<td>180x80 x162</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-32 ºC cold start</td>
<td></td>
</tr>
</tbody>
</table>

\(^{(1)}\) Value in \(\frac{1}{2}\) x DT (Distance Traveled) CEP with VMS (Velocity Measurement System) and ZUPT (Zero Update)
\(^{(2)}\) Mil rms after dynamic alignment; Typical values
\(^{(3)}\) U3: alignment with GNSS
\(^{(4)}\) Depends on shock profile
\(^{(5)}\) -32°C cold start
An INS for each type of mission and environment

**Artillery**
Modern artillery launchers need accurate positioning and pointing, even in GNSS denied conditions, robustness to shocks and very high reliability with optimized total cost of ownership.

**Radar**
Radar systems require increasing pointing accuracy and high mobility: counter battery radars, air defense radars, tactical air control radars, and doppler ground surveillance radars.

**Combat Vehicles**
Today’s combat vehicles, such as infantry fighting or battle tanks, need accuracy for tactical navigation, missile alignment, targeting, collaborative combat, and augmented reality.

**Optronics**
Optronic observation systems being mostly mast mounted, they require the integration of lightweight but performant INS very close to the sensors.

**Multipurpose Vehicles**
As with civil vehicles, it is likely that all military multipurpose vehicles will be equipped with navigation systems to navigate on the battlefield and to report BFT data.

**UGVs**
UGVs require ever-increasing accuracy for indoor and outdoor positioning and pointing, target designation, or even LIDAR orientation.
<table>
<thead>
<tr>
<th>TECHNOLOGY</th>
<th>MEMS</th>
<th>FOG</th>
<th>FOG</th>
<th>FOG</th>
<th>FOG</th>
</tr>
</thead>
<tbody>
<tr>
<td>TACTICAL VEHICLES</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Multipurpose navigation for security forces</td>
<td>•</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multipurpose navigation and BFT for defense missions</td>
<td>•</td>
<td>•</td>
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</tr>
<tr>
<td>Unmanned Ground Vehicles</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td></td>
<td></td>
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<tr>
<td>Infantry fighting vehicles</td>
<td></td>
<td>•</td>
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<td></td>
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<tr>
<td>Reconnaissance</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
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<tr>
<td>Battle tanks</td>
<td>•</td>
<td>•</td>
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<td>•</td>
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<tr>
<td>Weapon stations</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ARTILLERY AND RADARS</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>VSHORADS</td>
<td>•</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Light mortars, short range G2G radars</td>
<td>•</td>
<td>•</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SHORADS, heavy mortars, medium range howitzers and rocket launchers, G2G radars</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MRADS, counterbattery radars, long range artillery launchers</td>
<td>•</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Topographic systems</td>
<td>•</td>
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</tr>
<tr>
<td>Forward observers optronic systems</td>
<td>•</td>
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</tbody>
</table>
For multiple reasons, an increasing number of customers require OEM products with different levels of integration. For instance, they may:

- Want better sensors to improve the performance of their own INS
- Need to master the final integration steps so as to meet industrial or maintenance policy requirements
- Need to reduce footprint and save weight and volume for stringent integrations (unmanned vehicles, radar antennas, optronic payloads, etc.)
- Want to integrate the sensors into a hosting hardware with other electronic devices
- Want to design the hosting hardware themselves to ensure protection against a specific environment

iXblue’s OEM policy objective is to match such expectations. iXblue benefits from extensive experience in Autonomous Underwater Vehicles and is now deploying its expertise to offer high-performance, easy-to-integrate, and cost-effective FOG-based INUs.
STABILIZED PLATFORMS
iXblue reliable stabilization systems provide accurate performance when operating over extended periods of time in extreme environments. By developing new accurate stabilized platforms compliant with military and security applications, iXblue is supporting customers in their bid to make the difference on the battlefield.

Unlike competitors, iXblue’s range of stabilized platforms can be dimensioned to match all payload categories. With its off-the-shelf stabilized platforms, iXblue offers customers - in particular for optronic, radars and weapon systems - the chance to procure high-performance equipments that are easy to integrate and operate.

Up-to-date technology: iXblue systems leverage the most advanced and proven technologies for efficiency and consistency. Critical systems are individually implemented once their technological maturity is fully demonstrated for land usage through intensive testing and trials. Cutting-edge hardware and COTS software are used in addition wherever possible and appropriate, to minimize costs.

Performance: iXblue systems’ performance is the product of years of high level R&D investment in the field of accurate rotating systems and of state-of-the-art land defense gyrostabilization. We aim at designing systems that meet not just one paramount performance criterion but the whole set of critical and desirable requirements that make the systems perfectly suited to the most demanding land usage. We refuse technological compromises and strongly believe that the most capable systems result from innovation and excellence.

Ruggedized: from the outset, iXblue systems are thought and built taking into account land critical environmental factors (vibrations, shocks, extreme temperatures, etc.). Extensive testing is performed to verify compliance with the operating requirements. iXblue stabilized platforms are combat proven.

Reliability is iXblue’s trademark. Reliability, together with the lowest levels of preventive maintenance, are key principles that govern iXblue’s technical choices in systems design. In addition, iXblue offers a 24/7 technical support service worldwide to guarantee the highest level of system serviceability for its customers.

Export clearance: All of our off-the-shelf stabilized platforms are free of foreign export licensing. Export restrictions might apply depending on the payload embedded onto the platform and adaptation required.

Commonality, scalability, versatility: iXblue can act as a local supplier of subassemblies for large companies. iXblue is able to produce large quantities for these companies and assures the maintenance of its product range for several years. This results in significant savings at fleet level in terms of integration, installation, configuration management, logistics, training and maintenance costs. The use of a unique communication protocol allows a high level of commonality, thus minimizing non-recurring costs for our customers.

With over 30 years of mechatronics expertise in motion simulation, iXblue stands out as an independent leader in platform stabilization solutions, producing a range of highly reliable and accurate stabilized platforms sensitive to both customer’s needs and budget requirements.
A comprehensive range of stabilized platforms for all payloads & applications

iXblue has developed a comprehensive range of two-axis stabilized platforms perfectly suited for all on-the-move applications, requiring both heavy payloads stabilization (up to 200kg) and highly-accurate Line Of Sight (down to 10 µrad class).

Striving to be at the forefront of technological innovation, iXblue teams of experts constantly push back the limits of science to design and manufacture cutting-edge platforms to stabilize the heaviest payloads available while providing the most accurate Line Of Sight possible.

Thanks to its recognized expertise, iXblue combat-proven technology has now been chosen to provide reliable stabilization, accurate pointing, as well as precise positioning and orientation to numerous military forces, police and security services worldwide.

**Key benefits**

- Off-the-shelf turrets and taylor made
- ITAR-free
- Standard communication protocol
- Harsh environment and combat-proven

**STABILIZED PLATFORMS**

![Image](image_url)

A comprehensive range of stabilized platforms for all payloads & applications

**Leos**

Cutting-edge gyrostabilization of the Line Of Sight (LOS) is provided by the Leos platform that brings improved bandwidth of the control loop thanks to the unique combination of high-grade gyroscopes, advanced algorithms and a stiff mechanical structure.

**Kheops**

“T” shape geometry and high torque motors for heavy and unbalanced payloads.

**Payload weight**

0
15kg
20kg
40kg
200kg

<table>
<thead>
<tr>
<th>Line of Sight Gyrostabilization</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;20 µrad</td>
</tr>
<tr>
<td>&lt;100 µrad</td>
</tr>
<tr>
<td>&lt;1 µrad</td>
</tr>
</tbody>
</table>

**Payload weight**

0
15kg
20kg
40kg
200kg

<table>
<thead>
<tr>
<th>Payload weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>15kg</td>
</tr>
<tr>
<td>20kg</td>
</tr>
<tr>
<td>40kg</td>
</tr>
<tr>
<td>200kg</td>
</tr>
</tbody>
</table>

**Key benefits**

- Off-the-shelf turrets and taylor made
- ITAR-free
- Standard communication protocol
- Harsh environment and combat-proven
A complete range of stabilized platforms for on-the-move operations in the harshest environments

**Osiris**
SINGLE-AXIS GYROSTABILIZED PLATFORM FOR RF FLAT PANELS

Used for both surveillance and communication applications, Osiris ensures panoramic reconnaissance capability by providing quick rotation and fixed positioning of AESA RADAR antennas.

**Ceos**
TWO-AXIS GYROSTABILIZED PLATFORM FOR SINGLE PAYLOAD

Used for situational awareness, security and surveillance applications. Ceos light-weight platform guarantees sharp images and/or videos by providing reliable stabilization to the most modern medium-weight integrated optical sensors packages.

**Neos**
TWO-AXIS GYROSTABILIZED PLATFORM FOR MULTIPLE PAYLOADS

Used for situational awareness, security and surveillance applications. Neos offers a versatile platform that enables multiple optical sensors packages to provide sharp images and/or videos.

**Leos Series**
HIGHLY ACCURATE TWO-AXIS GYROSTABILIZED PLATFORM FOR OPTRONIC SENSORS

Used for observation, reconnaissance and targeting applications, Leos achieves ultimate Line Of Sight stabilization. Thanks to the integration of high-grade gyroscopes coupled to advanced algorithms, Leos maintains medium-weight optronic sensors’ performance, detection, reconnaissance and identification capabilities.

As of today, two models are available and provide various degrees of gyrostabilization according to customers’ needs.

**Kheops**
TWO-AXIS GYROSTABILIZED PLATFORM FOR HEAVY PAYLOADS

Used for surveillance, tracking, communication and firing applications. Kheops is a versatile and high torque platform that can accommodate multiple payloads and that ensures Line Of Sight’s accurate direction.
<table>
<thead>
<tr>
<th>Model</th>
<th>OSIRIS</th>
<th>CEOS</th>
<th>NEOS</th>
<th>LEOS LS</th>
<th>LEOS L7</th>
<th>KHEOPS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main Characteristics &amp; Performance</strong></td>
<td>1-axes</td>
<td>2-axes</td>
<td>2-axes</td>
<td>2-axes</td>
<td>2-axes</td>
<td>2-axes</td>
</tr>
<tr>
<td>GYROSTABILIZED LINE OF SIGHT</td>
<td>&lt;1mrad</td>
<td>&lt;1mrad</td>
<td>&lt;1mrad</td>
<td>&lt;100 µrad</td>
<td>&lt;20 µrad</td>
<td>&lt;1mrad</td>
</tr>
<tr>
<td><strong>Type of Payload</strong></td>
<td>In one piece</td>
<td>In one piece</td>
<td>One, two or three pieces</td>
<td>In one piece</td>
<td>In one piece</td>
<td>One or two piece</td>
</tr>
<tr>
<td><strong>Nominal Payload</strong> (Ground Fixed System)</td>
<td>up to 50 kg</td>
<td>up to 30 kg</td>
<td>up to 60 kg</td>
<td>up to 40 kg</td>
<td>up to 40 kg</td>
<td>up to 400 kg</td>
</tr>
<tr>
<td><strong>Nominal Payload</strong> (Ground Mobile System)</td>
<td>up to 30 kg</td>
<td>up to 15 kg</td>
<td>up to 40 kg</td>
<td>up to 20 kg</td>
<td>up to 20 kg</td>
<td>up to 200 kg</td>
</tr>
<tr>
<td><strong>Position Accuracy</strong></td>
<td>Azimuth ≤ 0.05°</td>
<td>Azimuth ≤ 0.05°</td>
<td>Elevation ≤ 0.01°</td>
<td>≤ 0.01°</td>
<td>≤ 0.01°</td>
<td>≤ 0.01°</td>
</tr>
<tr>
<td><strong>Angular Speed</strong></td>
<td>up to 180°/sec</td>
<td>up to 60°/sec</td>
<td>up to 60°/sec</td>
<td>up to 120°/sec</td>
<td>up to 120°/sec</td>
<td>up to 50°/sec</td>
</tr>
<tr>
<td><strong>Angular Acceleration</strong></td>
<td>up to 200°/sec²</td>
<td>up to 60°/sec²</td>
<td>up to 90°/sec²</td>
<td>up to 150°/sec²</td>
<td>up to 150°/sec²</td>
<td>up to 150°/sec²</td>
</tr>
<tr>
<td><strong>Physical Characteristics</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimensions</td>
<td>550 x 220 x 290mm³ (without arm)</td>
<td>320 x 165 x 385mm³ (with bridge)</td>
<td>230 x 285 x 535mm³ (with bridge)</td>
<td>Diameter 500 x 500m²</td>
<td>Diameter 500 x 500m²</td>
<td>Diameter 750 x 900m²</td>
</tr>
<tr>
<td>Weight</td>
<td>22kg</td>
<td>12kg</td>
<td>24kg</td>
<td>45kg</td>
<td>45kg</td>
<td>&lt;300kg</td>
</tr>
<tr>
<td>Qualification</td>
<td>MIL-STD 810, 461 and 1275</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Temperatures</td>
<td>-32°C to +71°C</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

*Optronics not supplied by iXblue*
A stabilized platform for each type of payload

**APPLICATIONS**

**OPTRONICS**

ixblue’s platforms cover the full spectrum of gyrostabilization needs for optronic payloads such as visible cameras, infrared cameras, lasers, handheld thermal imagers.

**ANTENNAS**

ixblue’s platforms provide high-grade on-the-move gyrostabilization for radars, satellite communication and data link antennas that need accurate and reliable tracking capabilities.

**WEAPONS**

ixblue provides robust and reliable platforms for the accurate aiming and stabilization of missile and rocket launchers, guns and weapon carriers during aiming and firing operations.
With its vast stretches of mountains and rugged valleys, Afghanistan was a hugely problematic terrain for the Allied forces deployed in the region during the last conflict. One of the main difficulties was the effect of the topography on the means of communication. By blocking the signal, mountains often make conventional radio links simply impossible. In 2009, this led the French Ministry of Defense to ask for the development and deployment as quickly as possible of a SOTM (SATCOM On The Move) capable of staying permanently connected and reliable over long periods of time. One of the biggest difficulties encountered when armored vehicles move in rough terrain is to permanently ensure the stability of the transmitting terminal and keep it pointed towards the satellite. The solution finally imagined was the gystabilization technology, with hybrid orientation systems (mechanical / electronic) of the beam working in perfect symbiosis with each other, so that the beam remains pointed towards the satellite regardless of the terrain topography. IXblue has especially developed the positioner and the ACU (Antenna control Unit) for Thales. The positioner is holding the antenna and is directly mounted onto the vehicle. It ensures the pointing of the beam around azimuthal axis (with high bandwidth and low friction). The ACU is mounted inside the vehicle and allows the power supply of the sensors (gyros, antennas…) as well as the control of the system (with a real time core). Over 30 units have been delivered to Thales Communication and Security.

For Very-Short-Range Air-Defence (VSHORAD) and Anti-Tank (AT) systems mounted on armored vehicles, Kheops can be equipped with a bridge providing interface to handle standard launchers (rockets) or carriers (missiles). Moreover, vintage armored carriers – wheeled or tracked – originally equipped with pintle mounts, found in this product a solution to maintain their military effectiveness with the latest technology available and personnel safety with remote capability. Adding a Ursa, Lyra or Vega, customers benefit from a full navigating solution with heading and location even in GNSS denied environment or binding relief.

For custom requirements concerning weapon station, our design office will offer innovative solutions with special care regarding critical characteristics:
- Stabilization of the Line Of Sight
- Accessibility for reloading
- Shocks and climatics environments
- Fire security at platform level
Motion Controllers and Servo-Drive Units

This series of rugged Motion Controllers and Servo-Drive Units provide position, rate and gyrostabilization for two axis platforms. The MCDU family is based on modular architecture with filter boards, controllers and servo-drive units (see figure) compatible with a wide range of motors (DC, BLDC or BLAC type).

Communication is ensured by serial link and iXlink protocol at refresh rate up to 1 kHz. Reliability and long lifetime with short circuit, over speed, temperature limit, position/rate/acceleration limits. The control algorithms are based on the latest iXblue developments protected by several patents.

<table>
<thead>
<tr>
<th>PARAMETERS</th>
<th>MCDU 10</th>
<th>MCDU 17</th>
<th>MCDU 35</th>
</tr>
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<tbody>
<tr>
<td>INPUT VOLTAGE (VDC)</td>
<td>18-32</td>
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<tr>
<td>OUTPUT CONTINUOUS CURRENT (EACH AXIS) FOR DC MOTORS (A)</td>
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<td>17</td>
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<tr>
<td>OUTPUT RMS CURRENT (EACH AXIS) FOR AC MOTORS (A)</td>
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<td>12</td>
<td>25</td>
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<tr>
<td>WEIGHT (KG)</td>
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<td>&lt;10</td>
<td>&lt;16</td>
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<td>OVERALL DIMENSIONS (MM)</td>
<td>250 x 214 x 143</td>
<td>500 x 300 x 250</td>
<td>600 x 400 x 250</td>
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<tr>
<td>COMPATIBLE WITH GYROSTABILIZATION</td>
<td>•</td>
<td>•</td>
<td>•</td>
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<tr>
<td>ENVIRONMENT</td>
<td>-40° to +70°C, MIL-STD-461E, IP67, MIL-STD-1275</td>
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</tbody>
</table>
INTEGRATED SOLUTIONS
Leveraging state-of-the-art expertise in inertial navigation systems and stabilized platforms, iXblue offers innovative end-to-end solutions for continuous and reliable operations in ever increasing GNSS denied environments.

INTEGRATED SOLUTIONS

Navigation Suites

- NAVIGATION SUITE FOR MILITARY FORCES
- NAVIGATION SUITE FOR SECURITY FORCES
- NAVIGATION SUITE FOR AMPHIBIOUS WARFARE

High quality georeferenced image

- ADVANS POS

Gun Laying and Topographic System

- ADVANS THEODOLITE - GLTS

Target locator

- ADVANS VEGA TARGET LOCATOR MODULE
 Until very recently, inertial navigation systems were absent from most tactical platforms. Things are now changing with the need for tactical vehicles to be equipped with navigation sensors, robust to GNSS drop out, and which information is displayed onto a moving map.

We are offering a complete navigation suite to provide military forces with undisrupted navigation available at all times and in all environments to conduct their topographical and navigation missions with the utmost reliability.

Made up of our state-of-the-art INS, combined to external sensors (GNSS, VMS) and to Horus navigation software, our navigation suite offers highly reliable and accurate navigation information and is easy to integrate and operate thanks to its intuitive user-interface that displays all navigation information on a screen within the vehicle.

Furthermore, combining our INS with Horus navigation software enables better accuracy as it allows the INS drift to be corrected in real-time thanks to all topographical elements information included within the software.

Key benefits

• Continuous navigation during the mission
• Robust to GNSS jamming
• Easy to integrate on a wide range of vehicles

Our solution

Advans Navigation Suite: undisrupted navigation at all times for military forces

3 methods of inertial navigation drift corrected by topography
Proton Navigation Suite: an intuitive system for undisrupted navigation for security forces

YOUR REQUIREMENT

Nowadays, individual have access to the GPS technology almost anywhere and anytime thanks to their smartphone and finding one’s location and navigating has never been easier. However, GPS can be disrupted by multiple factors such as environmental and geographic obstacles (tunnels, buildings, forests…), denied service or signal jamming/spoofing by third parties. This lack of continuity can lead to disastrous consequences for the outcome of security forces operations.

OUR SOLUTION

It is to make the reliable inertial navigation technology accessible to security forces worldwide and to ensure that undisrupted navigation is available at all times that iXblue has developed the Proton INS and its dedicated moving map, Horus. Based on the MEMS (Micro-Electro-Mechanical Systems) technology, it offers highly reliable and accurate navigation information and is easy to integrate and operate thanks to its intuitive user interface that display all navigation information on a screen within the vehicle.

Combining the Proton INS to Horus moving map enables better accuracy as the INS drift can be corrected in real-time thanks to all topographical elements information included within the software.

With this new navigation suite iXblue offers security forces a simple and cost-effective navigation solution that helps them conduct safe and reliable operations.

Because iXblue strives to closely meet the needs of the end-user, the company has partnered with other innovative French companies to offer a comprehensive surveillance solution to security forces. Making the most of the best technologies available, this new performant and lightweight surveillance solution, easy to integrate, is equipped with iXblue products including: Proton INS, Horus mapping software, and Ceos, gyrostabilized pointing platform.

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Amphibious warfare navigation suite: undisrupted navigation between sea and land environments

In amphibious operations, the first challenge is discontinuity of information between sea and land environments. This is the main feature of these operations. Furthermore, whatever the theater, whatever the conditions, any amphibious operation has to contend with the threat of jamming of GNSS signals. This risk will be more and more prevalent.

In concrete terms, the challenge is to transmit critical data for INS alignment and repositioning from the vessels to the tactical vehicles instantaneously as they leave the landing craft before or after beaching.

This means that the landing craft have to be equipped with suitable navigation equipment, with the relevant routine to transfer this information to the land vehicles so that they are ready to start their land navigation immediately after beaching.

It also means that, in cases where amphibious assault vehicles (AAV’s) are used, after being launched off the coast, they can surface navigate from offshore to inshore, before switching to a land navigation mode once they reach the shoreline and begin to progress inland.

As a global leader in military-grade navigation solutions, iXblue can deliver all the components needed to guarantee end-to-end navigation capability for any amphibious operation.

Whatever the theater, whatever the conditions, iXblue’s comprehensive new amphibious offer combines all of this critical expertise to deliver seamlessly uninterrupted navigation information, without GNSS, from the open sea right through to the combat zone.

Our solution

iXblue’s innovative, end-to-end solution for undisrupted, reliable navigation capability is designed to keep your amphibious operations on track.

iXblue proposes an innovative solution, which has moved amphibious warfare navigation to a whole new level.

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Advans POS: AHRS/INS combined with positioner

YOUR REQUIREMENT

Nowadays, Inertial Navigation Systems (INS) are usually available on land vehicles and located inside the vehicle, far from the positioner.

As optronic devices have long range capabilities, and masts not stable enough, measurement errors can appear when using for geo-referencing and accurate target acquisition.

OUR SOLUTION

iXblue offers a solution that combined stabilized platforms and Inertial Navigation Systems. The INS is rigidly mounted at the bottom of the stabilized platform to improve positioning accuracy and minimize cost impact on the whole system. It provides continuous instant-on position and orientation (Positioner gives Azimuth and elevation position, and the INS gives the cape) in specific environments (frequency jamming) for observation, targeting or firing systems. The main purpose of this combination is movement correction especially for wind force when tripod-mounted or when embedded on a vehicle.

HIGH QUALITY GEOREFERENCED IMAGE
Advans Theodolite - GLTS: A new revolutionary tool with embedded INS for artillery applications

**YOUR REQUIREMENT**
- Military survey: to rapidly and efficiently elaborate topography referenced points on the battlefield.
- Artillery topography: to maintain gun position accuracy and high tempo of operations in GNSS denied environments.
- Gun laying: to control gun laying or to perform accurate gun orientation and positioning at very short notice.

**OUR SOLUTION**
- To perform those missions, iXblue provides the Advans Theodolite - GLTS, an innovative gun laying and topographic solution.
- While most systems exclusively rely on GNSS, iXblue’s Theodolite features an integrated high-grade INS that allows for instant and highly accurate measurements, even in GNSS denied environments.
- An optical sight enables target aiming and a laser Range Finder completes the system in order to get distance information. The GLTS Theodolite is coupled with Horus, a moving map developed by iXblue and dedicated to artillery operations.

**Key benefits**
- Undisrupted navigation in GNSS denied environment
- Fast deployment
- Compatibility with any fire control system
- Designed to withstand harsh conditions

**Key features**

<table>
<thead>
<tr>
<th>DISTANCE MEASUREMENT RANGE</th>
<th>30m to 4600m on NATO target</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEADING ACCURACY</td>
<td>≤1 mil rms</td>
</tr>
<tr>
<td>CONTINUOUS POSITION AND HEADING</td>
<td>Immediate availability</td>
</tr>
<tr>
<td>ENVIRONMENTAL CONDITIONS</td>
<td>Compliant with MIL-STD-810C</td>
</tr>
</tbody>
</table>

**All functions in one system for digitization**
Advans Vega Target locator module: A new revolutionary lightweight tool with embedded INS for forward operations

Your Requirement
Joint terminal attack controllers (JTACs), Forward Air Controllers (FACs) and Forward Observers (FO’s) rely on various instruments such as laser range finders, GPS, goniometers and north finders to conduct their missions (surveillance, target acquisition and coordinates extraction). However, north finders require time for calibration on the battlefield and GPS can be dropped out.

Our Solution
iXblue’s Advans Vega Target Locator, combined with Horus moving map, offers a compact and lightweight all-in-one solution that can fit all handheld thermal imagers. It can be carried into a backpack and enables military forces to reduce operations time and provides undisrupted navigation information. iXblue’s Advans Vega Target Locator bypasses all the constraints linked to North finders and saves exponential time as the INS provides accurate positioning information at all times and is instantly ready to use, even in GNSS denied environments.

Key Benefits
- Robust to GNSS jamming
- Continuous navigation from the tactical command room to the observation point
- Instantaneous deployment
- Lightweight
- Compatible with all cameras and tripod

Key Features

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>TARGET LOCATION ERROR</td>
<td>CAT 1</td>
</tr>
<tr>
<td>HEADING ACCURACY</td>
<td>≤0.5 mil rms</td>
</tr>
<tr>
<td>MODULE WEIGHT</td>
<td>5kg class</td>
</tr>
<tr>
<td>ENVIRONMENTAL CONDITIONS</td>
<td>Compliant with MIL-STD-810G</td>
</tr>
</tbody>
</table>

Target Location:
- iXblue mapping software
- Third-party handled thermal camera
- Third-party tripod
iXblue stands as a global leader in the design and manufacturing of innovative solutions for navigation, positioning and pointing. Using its unique technologies, the company offers its defense & security customers turnkey solutions, enabling them to address their increased challenges and carry out their operations with optimum efficiency and safety.

iXblue is recognized throughout the industry for its navigation systems and stabilized platform that provide unequalled performance and cost of ownership benefits.

Underpinned by 30 years of expertise, iXblue conducts its business in over 35 countries worldwide. The company can count on full-value chain expertise: all of its systems are produced internally, from design to manufacturing. Its success is especially informed by its specific expertise which pervades all critical activities from its engineering of offices to its production workshops.

Combining mastery of technology and agility to solve our customers’ issues

At iXblue, we strongly believe that mastering technology is key to finding the answers to unsolved questions. We believe it is our responsibility to provide our customers with clear solutions. To that end, we are capable of pushing technology beyond the existing limits. Mastering technology also means being agile in a complex and changing environment. iXblue is convinced that flexibility allows us to find the solutions that best fit our customers’ needs.

Making technology accessible & adapting it to individual customer needs

It is our responsibility not only to push technology forward but also to make it accessible to our customers. In addition to adapting it to their very specific needs, we must make it easy to use, and easy to master. That is why we strive to make our solutions:

- Tailored to customers’ specific needs
- Easy to integrate and deploy
- Compatible with third-party sensors
- Easy to use
- Reliable
- Cost-efficient

People at the heart of the company

Built on values of shared trust and empowerment of the employees, iXblue promotes the self-fulfillment of the employees as a means to reach collective goals. The company also supports personal realization through work; it encourages and helps the development and progress of all.

Trusting iXblue experts to implement tomorrow’s solutions

iXblue has always been an avant-garde high-technology company: it is in our DNA. By working with our experts, you choose to rely on our unique expertise and be visionary. You implement today’s innovative solutions which will become tomorrow’s standards. You embrace technological breakthrough. The trust you place in iXblue allows us to always go further and push technology beyond its limits.
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