Land Defense

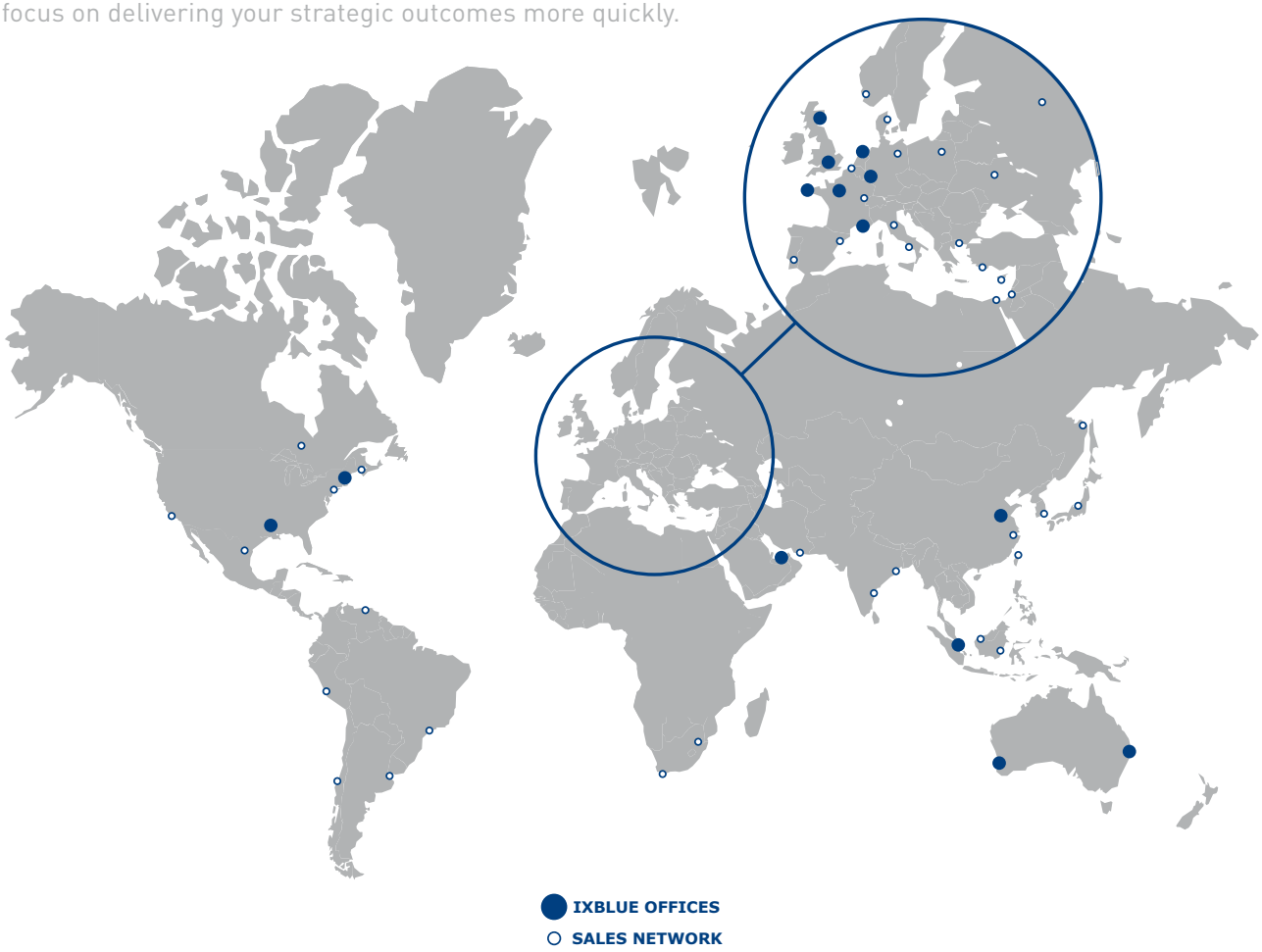
PRODUCT CATALOGUE

iXblue

DEEP INSIGHT. SHARPER SENSES.

«i» stands for Imagination. «X» is the eXcellence for which we strive. Our technologies, equipment, and systems assure you superiority in all senses - navigating from the depths of the ocean to the reaches of outer space.

Organized in 8 business areas, iXBlue is an independent group able to combine its unique technologies, products, systems and services from across its subsidiaries to provide unique solutions that fit your business requirements and focus on delivering your strategic outcomes more quickly.



The group has a strong worlwide presence and service facilities in the USA, the UK, France, the Netherlands, Germany, Dubai , Australia and Singapore.

IXBLUE Divisions

• Acoustic Products
IXSEA subsea Acoustic Positioning combined with our Inertial Navigation System (INS) enables us to provide accurate and robust subsea tracking solutions for AUVs, divers and more...

• Advanced Components
IXFIBER is a leading manufacturer of active and passive specialty optical fibers, components based on Bragg gratings technology, and subassemblies modules for a diverse range of industries.

• Inertial Products
IXSEA' s Fiber Optic Gyroscope (FOG) technology, which has reached the highest international standards for use from submarine to space navigation, is at the heart of our easy to use and versatile Gyrocompasses and Inertial Navigation Systems (INS). IXSEA, today, is recognized as the market leader in FOG based Inertial Navigation Systems (INS), Attitude, Heading Reference Systems (AHRS) and Gyrocompass specifically designed for the défense, civil and space market.

• Integrated Solutions
SODENA is specialized in Software and PC-based built-in solutions for the naval markets. Main products are ECS, ECDIS IMO certified or WECDIS NATO compliant systems. RADAR solutions and Data Distribution Units (DDU) are also provided to propose full turnkey Integrated Navigation Systems.

• Marine Works
IXBLUE with its own shipyard, H2X and IXELEK, has acquired a long experience to provide custom built Hydrography and Oceanography vessels. Alternatively, we can install your solution on your own vessel in dockyards using 1500m of quays with lifting for up to 600 tons.

• Motion Systems
IXMOTION is specialized in high precision mechanical technology to develop positioning and rate tables for the defense industry such as: Multi-axis motion simulators, multi-axis ground and embedded positioners for inertial testing, gyrostabilized platforms and positioning systems for optical sensors, MEMS, lasers and communication devices.

• Sea Operations
IXSURVEY skills are in the measurement and interpretation of the physical chemical and biological marine environment. The company's experienced surveyors delivers: hydrographic surveys for safety of navigation, biological & environmental studies, oceanographic measurements, geophysical site investigations, sea trials & equipment testing.

• Sonar Systems
IXSEA manufactures Side Scan Sonars, acoustic releases and mapping software for seabed reconnaissance. Its mapping system uses Synthetic Aperture Sonar technology to produce an acoustic image of the seabed. Tight integration of the inertial navigation and acoustic positioning technics enables real-time display and collection of georeferenced, orthorectified images.

IXBLUE EXPERTISE

Fiber-Optic
Fiber-Optic Gyroscope

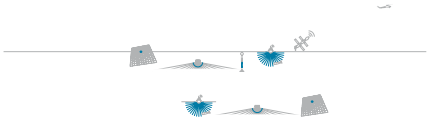
advanced multi-Axis controller
Motion simulators & positioning systems

TECHNOLOGY

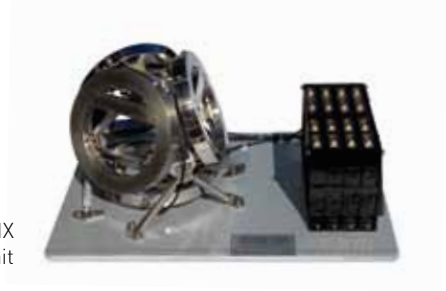
FIBER-OPTIC GYROSCOPE

Since the early 80's, IXSEA has been capitalizing on industrial experience with Fiber-Optic Gyroscopes (FOGs), especially in fields such as defense and space where reliability over time is at a premium.
The Fiber-Optic Gyroscope is the best and only truly-solid-state answer to rotation sensing: no spinning element (mechanical gyro), no mechanical activation (ring laser gyro). This makes it ideal for strap-down system Fiber Optic coil winding applications.

Based on the Sagnac effect, FOG is the unique technology able to measure rotation rates at the highest accuracy and with unrivalled low noise levels.
Today, IXSEA is working in close partnership with ASTRIUM and ESA for FOG use in space, with the latest generation of earth observation satellites - such as Pleiades program by CNES.



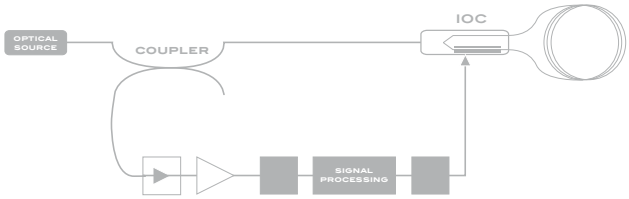
Principle of Fiber Optic Gyroscope



ASTRIX
FOG Inertial Measurement Unit

FIBER-OPTIC
TECHNOLOGY

FOGs feature among the rare technologies where no component has a limited life cycle, even after hundreds of thousands of hours use. FOG technology uses no moving part unlike other systems on the market which are subject to wear and tear leading to lower quality performance or even breakdown (for example, ball bearings and mirrors in certain other technologies).
IXSEA's FOG technology has been specially devised as much for the mechanical equipment of its sensitive components (such as fibre coil), as for the servo-control electronics in a closed loop, in order to provide resistance and maintain high performance in an extreme mechanical environment. In this way IXSEA's inertial systems, mounted directly on the barrel of a canon, successfully came through shooting trials with standard munitions.



FIBER-OPTIC
TECHNOLOGY

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Today, IXSEA is working in close partnership with ASTRIUM SAS, for FOG use in space, with the latest generation of earth observation satellites - such as Pleiades program by CNES.

FIBER-OPTIC
TECHNOLOGY

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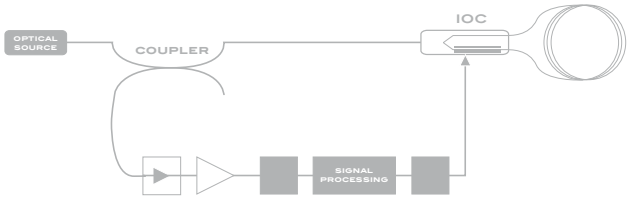


IXBLUE'S DEFENSE PRODUCTS

ADVANS URSA
Autonomous Pointing and Targeting System

ADVANS LYRA
High Grade Tactical Land Navigation System

ADVANS VEGA
high grade Autonomous
Pointing and Positioning system

ADVANS OMEGA
High end Targeting and Positioning System

Motion Systems

ADVANS URSA

Autonomous pointing & targeting system

ADVANS URSA is a reliable, maintenance-free integrated reference system for stabilization and pointing systems of radars, gun turrets, rocket launchers and other weapon systems. Designed for land vehicles and mobile heavy guns, it provides highly accurate heading, roll and pitch output with a fast set up and response time, ideal for battlefield weapon alignment and similar applications.

Features

- Accurate heading, roll & pitch outputs
- No mechanical nor dithering part
- Space-grade FOG technology
- Fast alignment

Benefits

- Efficient stabilization & control loop
- No maintenance required
- 30,000 hours MTBF
- Rapidly operational

Applications: Radar systems • Reconnaissance vehicles • Turrets stabilization and pointing • Weapon systems

Technical specifications

ADVANS URSA is based on in-house Fiber-Optic Gyroscopes (FOGs) sensors developed and manufactured by IXSEA for decades, to meet the most stringent requirements of demanding applications such as satellite control, marine and submarine vessels, land and aerial vehicles.

PERFORMANCES

Heading accuracy	2 mils rms x secant lat
Roll & pitch accuracy	0.2 mils rms
Set-up time (static)	< 2 min
Set-up time (dynamic)	< 5 min

INTERFACES

Power consumption	< 18 W no cooling required
Power input range	12 to 32 VDC
Input / output formats	RS232/422 - Ethernet TCP/UDP
Update rate	Up to 200 Hz

ENVIRONMENTAL

MTBF	> 30,000 hours
Operation temperature range	-30°C to 60°C
Storage temperature range	-46°C to 80°C
Angular rates	> 200 °/s
Vibration	MIL STD 810
Shocks	30 g, 10 ms
Orientation	Can be mounted in any orientation
Roll and pitch	No limitation
EMC	MIL STD 461

PHYSICAL CHARACTERISTICS

Size (L x W x H)	276 x 136 x 148 mm
Weight	4.5 Kg

ADVANS LYRA

HIGH GRADE TACTICAL LAND NAVIGATION SYSTEM

ADVANS LYRA is a land navigation system which provides a continuous, instant-on tactical position of the vehicle, even in GPS denied areas. Maintenance-free and robust; it is a perfect solution to navigate in critical situations, as well as providing a stabilized reference and pointing system, for any mobile weapon systems such as a 105mm battlefield gun.

FEATURES

- Accurate heading, roll & pitch outputs
- No mechanical nor dithering part
- Space-grade FOG technology
- Accurate horizontal position
- Fast on the move alignment

BENEFITS

- Efficient stabilization & control loop
- No maintenance required
- 30,000 hours MTBF
- Precise targeting operations
- Rapidly operational

APPLICATIONS: Reconnaissance vehicles • Infantry fighting vehicles • Mortar and artillery systems • Main battle tanks • Ground based vehicles

Technical specifications

PERFORMANCES

Horizontal position INS VMS	0.3% DT CEP
Horizontal position INS VMS/GPS	< 10 m (depends on GPS performances)
Vertical position INS VMS	0.2% DT PE
Vertical position INS VMS/GPS	< 10 m (depends on GPS performances)
Heading accuracy	1 mils rms x secant lat
Roll & Pitch accuracy	0.2 mils rms
Set-up time static	< 5 min
Set-up time dynamic	< 10 min (with DGPS)

INTERFACES

Power consumption (24VDC)	< 18 W no cooling required
Power input range	12 to 32 VDC
Input / output formats	RS232/422 - Ethernet TCP/UDP GPS input NMEA
Update rate	Up to 200 Hz

ENVIRONMENTAL

MTBF	> 30,000 hours
Operation temperature range	-40°C to 60°C
Storage temperature range	-46°C to 80°C
Angular rates	> 200 °/s
Vibration	MIL STD 810
Shocks	30 g, 10 ms
Power input range	12 to 32 VDC
Orientation	Can be mounted in any orientation
Roll and pitch	No limitation
EMC	MIL STD 461

PHYSICAL CHARACTERISTICS

Size (L x W x H)	276 x 136 x 148 mm
Weight	4.5 Kg

ADVANS VEGA

HIGH GRADE AUTONOMOUS POINTING AND POSITIONING SYSTEM

ADVANS VEGA is a high performance land navigator,providing an instant-on tactical position for main battle tanks or artillery, even in GPS denied areas. It is a perfect maintenance-free and robust solution to navigate a vehicle in critical situations as well as to point and stabilize the main gun or other weapon systems on board, with high accuracy.

FEATURES

- Accurate heading, roll & pitch outputs
- No mechanical nor dithering part
- Space-grade FOG technology
- Accurate horizontal position
- Fast on the move alignment

BENEFITS

- Efficient stabilization & control loop
- No maintenance required
- 30,000 hours MTBF
- Precise targeting operations
- Rapidly operational

APPLICATIONS: Turrets stabilization and pointing • Howitzer • Main battle tanks • Artillery systems

Technical specifications

Performances

Horizontal position INS VMS	0.1% DT CEP
Horizontal position INS VMS/GPS	< 10 m (depends on GPS performances)
Vertical position INS VMS	0.2% DT PE
Vertical position INS VMS/GPS	< 10 m (depends on GPS performances)
Heading accuracy	0.3 mils rms x secant lat
Roll & pitch accuracy	0.2 mils rms
Set-up time static	< 5 min
Set-up time dynamic	< 10 min (with DGPS)

Interfaces

Power consumption (24VDC)	< 18 W no cooling required
Power input range	12 to 32 VDC
Intput / output formats	RS232/422
Ethernet	TCP/UDP
GPS input	NMEA
Update rate	Up to 200 Hz

Environmental

MTBF	> 30,000 hours
Operation temperature range	-40°C to 60°C
Storage temperature range	-46°C to 80°C
Angular rates	> 200 °/s
Vibration	MIL STD 810
Shocks	30 g, 10 ms
Power input range	12 to 32 VDC
Orientation	Can be mounted in any orientation
Roll and pitch	No limitation
EMC	MIL STD 461

Physical characteristics

Size (L x W x H)	180 x 180 x 160 mm
Weight	4.5 Kg

ADVANS OMEGA

High end Targeting and Positioning System

ADVANS OMEGA is a high-end tactical navigation system, which provides instant-on position and stabilization for high-grade radar or high-performance surveillance vehicles. With maintenance free FOG technology inside, OMEGA is the GPS non-dependent inertial navigation system you need to meet your highest requirements; it enables you to stabilize and point radar or weapons systems, with perfect accuracy.

FEATURES

- Accurate heading, roll & pitch outputs
- No mechanical nor dithering part
- Space-grade FOG technology
- Very accurate horizontal position
- Fast on the move alignment

BENEFITS

- Efficient stabilization & control loop
- No maintenance required
- 30,000 hours MTBF
- Precise targeting operations
- Rapidly operational

Technical specifications

Performances

Horizontal position INS VMS	0.06% DT CEP
Horizontal position INS VMS/GPS	< 10 m (depends on GPS performances)
Vertical position INS VMS	0.03% DT PE
Vertical position INS VMS/GPS	< 10 m (depends on GPS performances)
Heading accuracy with GPS fusion	0.2 mils rms x secant lat
Heading accuracy pure inertial	0.3 mils rms x secant lat
Roll & pitch accuracy	0.15 mils rms
Set-up time static	5 min
Set-up time dynamic	< 10 min (with GPS)

Interfaces

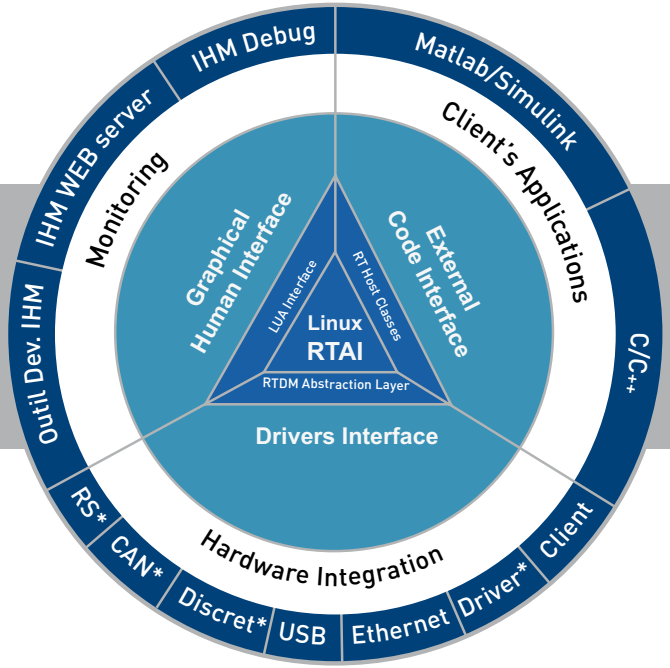
Power consumption (24VDC)	<18 W no cooling required
Power input range	19 to 32 VDC
Intput / output formats	RS232/422
Ethernet	TCP/UDP
GPS input	NMEA
Update rate	Up to 100 Hz

Environmental

MTBF	> 30,000 hours
Operation temperature range	-40°C to 60°C
Storage temperature range	-46°C to 80°C
Angular rates	> 200 °/s
Vibration	MIL STD 810
Shocks	30 g, 10 ms
Power input range	12 to 32 VDC
Orientation	Can be mounted in any orientation
Roll and pitch	No limitation
EMC	MIL STD 461

Physical characteristics

Size (L x W x H)	420 x 330 x 315 mm
Weight	25 Kg



ProAxe Chart

ProAxe

ADVANCED MULTI-AXIS CONTROLLER

IXMOTION has an extensive expertise in developing motion simulators and positioning systems. The heart of the technology is an unrivalled multi-axis controller using the Model-Based approach.

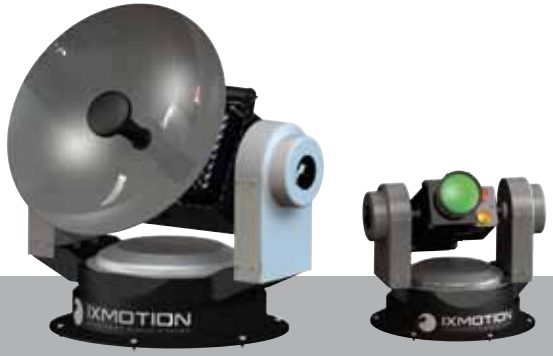
A breakthrough in motion simulation with ProAxe Multi-Axis Controller

- A Model-based approach used
- A mathematical model of the physical system with MATLAB-SIMULINK™
- Fully integrated into the real-time control algorithm

- Benefits (* Patent Pending)
  - Auto-Tuning* process
  - Fault detection
  - Rate and acceleration estimation improved
  - Auto-Adaptive* bandwidth enhancing in sinus mode
  - Anticogging*

Performances

- Real Time software based on RTAI/Linux
- LQG control algorithm (replace the classical PID structure)
- High level & Automatic system control parameters adjustment
- Kalman filters application
- Real time applications: maintaining position, rate and acceleration
- Command control integrated in standard PC104 or cPCI or PCI boards depending on application and request



POS SERIES

HIGH PRECISION MULTI-AXIS POSITIONERS

Multi-axis positioners POS Series is designed for embedded, gyro-stabilized and tracking systems for sensors and terminals of optical, communication, observation and telemetry.
POS SERIES are automatic mechanical systems to be integrated in an antenna station or a radar platform, designed in relation to the size, weight and inertia of the payload. POS Series can provide motions in azimuth, elevation and/or roll.

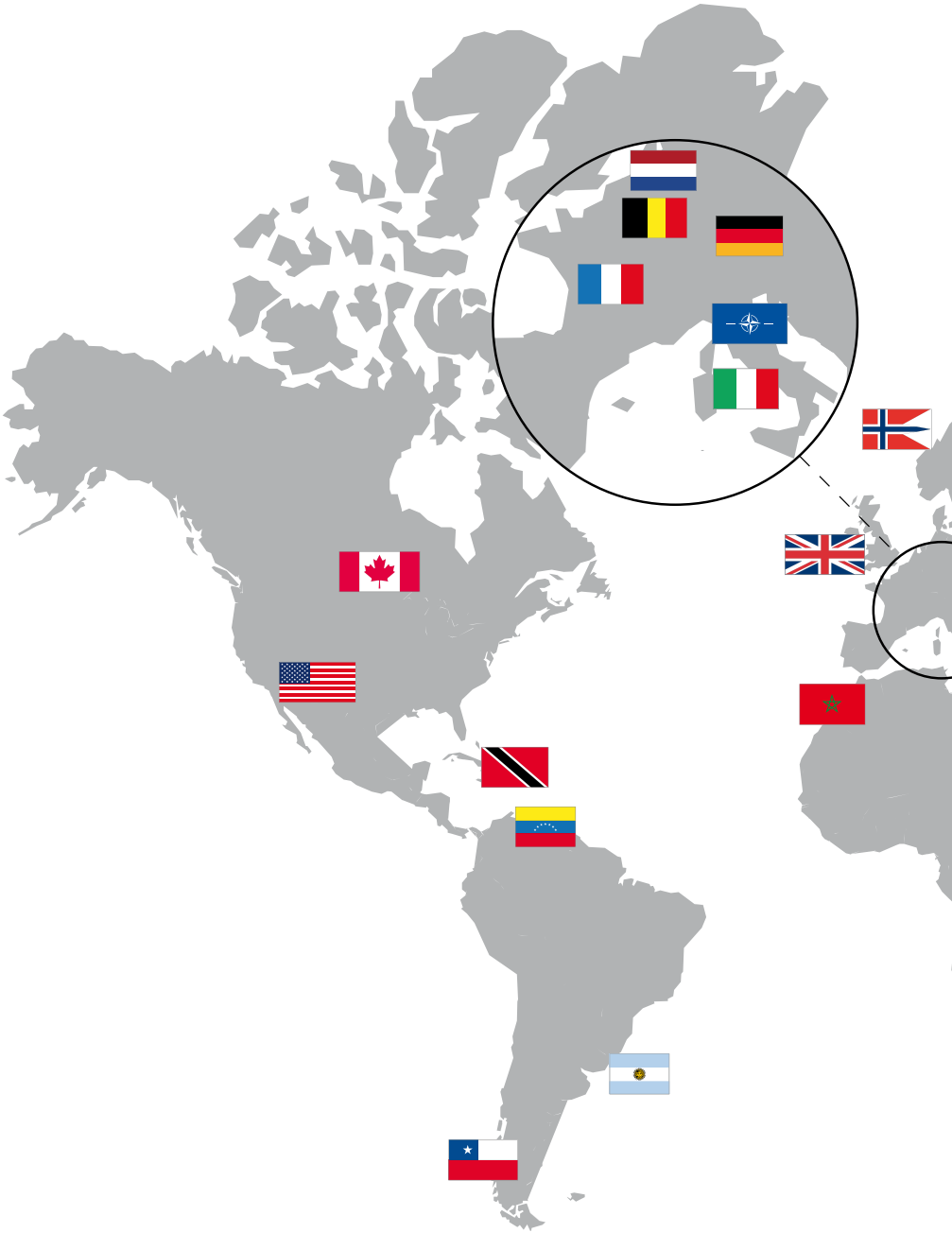
MAIN CHARACTERISTICS

- Pointing error: up to 0,01 deg
- Azimuth dynamic: up to 700 deg/sec, up to 2500 deg/sec²
- Elevation dynamic: 600 deg/sec, 400 deg/sec²
- Roll dynamic: 20 deg/sec, 20 deg/sec²

6-Slot Embedded MCU Series
Modular Control Unit

MAIN ADVANTAGES

- Gyro-stabilization function
- Tracking capabilities
- Several configurations such as ground, portable and embedded
- Can be used on land, naval and airborne applications
- Supplied with Embedded MCU Modular Control Unit with 3 to 6 slots using 1 to 4 CPU and user boards
- Advanced ProAxe Embedded Real Time Software developped on RTAI/LINUX



IXBLUE REFERENCES

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www.ixblue.com

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