THALES

www.thalesgroup.com

LAND OPTRONICS

WORLD CLASS VISION

Beyond conventional symmetric warfare, the biggest challenges today for regular armies and security forces lie in the struggle to neutralise asymmetric threats. The enemy is increasingly difficult to detect, hiding within civilian populations and infiltrating large borders.

To counter asymmetric threats, friendly forces increasingly rely on networks of cooperative advanced optroni c sensors to provide a detailed picture of the battlefield "on time, all the time and pro-cessed" as quickly as possible:

- To decrease the decision making loop
- To get the most reliable picture of the situation and win tactical superiority.

SUPPORTING LAND OPERATIONS: THE OPTRONICS EDGE

Providing the right image, at the right time, to make the right decision.

Over the past 40 years, optronic systems have gradually gained recognition as first level targeting and decision making tools. Land optronics offer a new perspective of the battlefield and provide a leading edge in combat.

ENSURE PERMANENT VISION IN ALL CONDITIONS

Being able to take action in day and night scenarios, in all weather conditions, is a strong request from commanding bodies. Few countries in the world have demonstrated their ability to deploy their full military power at night. Being able to fight at night has become a decisive success factor, offering vehicles and troops a winning edge in the field.

COMMUNICATE IMAGES AND DATA

Network connectivity is a key challenge that optronic system manufacturers are facing today. Digitalisation of the battlefield and dissemination of images, as well as data over digital networks, have become prime market trends. Leading armies will be those able to generate video, images and metadata in the field and instantly dispatch them over digital networks.

IMPROVE FRIEND / FOE RECOGNITION AND GENERATE PROOF OF ACTION

Modern conflicts involve a growing number of parties within increasingly compact mission theatres. This calls for optronic devices capable of generating accurate high resolution images to rapidly and reliably distinguish allies from opponents and non-combatant third parties. Also, with military operations being increasingly scrutinised and images from unchecked sources gaining worldwide visibility through both conventional media and social media, military staff need to offer high resolution images and video as valid proof to support or dismiss claims.

SCALABLE OPTRONIC SYSTEMS AND TECHNOLOGY

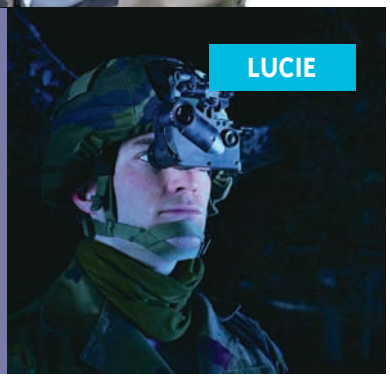
Depending on the type of engagement, terrain and threats involved, a wide range of optronic equipment may be in demand, from the most complex with a wide range of features, to the most affordable and easy to use. Scalable optronic technology, that accommodates every army's level of technical expertise, field requirements and budget rank high among today's market needs.

ENSURE PORTABILITY AND EASE OF USE

SWaP-C (Size, Weight and Power – Cost) is now on every commander's mind. Reducing size and weight, while maximising power, energy efficiency and connectivity is a prime concern. Success on the battlefield is often obtained by providing combatants with the most portable optronic devices, offering optimal ease of use under high levels of stress.

OPTRONIC DEVICES FOR COMBAT TROOPS

More features, more compact



Thermal imagers and target locators are among the most valuable items on the field, enhancing combatants' ability to see far beyond conventional eyesight. Thales is a leading supplier of advanced portable optronic devices for combat troops.

To gain an extra edge in today's operations and improve situational awareness, units increasingly rely on the Spy'Arrow micro unmanned aerial system, interconnected with thermal imagers. The system is often referred to as the 'flying Sophie'.

Handheld thermal imagers are a recognised area of excellence for the Group, with the range of Sophie cameras earning worldwide acceptance over the past fifteen years.

Thales handheld thermal imagers offer day and night recognition features that allow users to spot and recognise vehicles up to 6km away. Laser range finder features help locate targets and provide coordinates that may be transmitted over radio or any network such as Internet. Night vision goggles weighing less than 350g offer night time visibility of over several hundred metres, greatly enhancing night time mobility.

Laser target designators, associated or not with target locators, allow for accurate designation of targets in both day and night scenarios for Close Air Support.

Thales also supports ground troops deployed in combat areas by providing highly efficient automated threat warning
systems, with gunshot detection and 3D tracking of shooters.

12,000 Sophie hand held thermal imagers and target locators sold worldwide since 2000, in **55** countries

80,000 Lucie and Minie night vision goggles sold worldwide in 20 years

340g This is the weight of the Minie compact night vision goggles

Thales micro fixed-wing UAVs of less than **2kg** let ground troops extend their vision well beyond their line of sight

COMBAT AND RECCE VEHICLES

Enhancing gunnery, surveillance & driving

Thales offers a full range of optronic systems and equipment to help vehicles fully perform their operational role, by day and night. This includes driving and manoeuvring assistance with hatches down, surveillance, target acquisition and weapon aiming. By bringing together thermal imagery, colour imaging and laser technologies, together with gyro stabilisation and advanced processing, Thales vehicle mounted systems offer optimal performance, effectively identifying vehicles up to 8km away. Thales equipment also helps protect vehicles from harm by detecting threats using optical, laser and acoustic technologies.

Thales is supplying all of the optronic systems for the SCOUT SV combat reconnaissance vehicle that will become the flagship unit of the British army by 2020 and is also equipping the SCORPION vehicle under development for the French armed forces.

Thales is providing all driver vision enhancer (DVE) systems for the Canadian Army, with 1,100 systems installed.

Thales designed and installed the complete mission fit for the Foxhound protected patrol vehicle. The Foxhound is the first military vehicle equipped with a full Ethernet Generic Vehicle Architecture.

2,500 Gunnery sighting systems in service worldwide

2,000 TI Driving & Local Situational Awareness systems in service

8,000 Catherine cooled thermal imagers sold worldwide since 2005

2,000 TIM uncooled thermal imagers sold worldwide

1,200 Kate Sensor Packs for Remote Controlled Weapon Stations

5,000 DVE driver vision enhancers sold in **7** countries since 2005

- Gunnery sighting and weapon aiming
- Surveillance and target acquisition
- Driving and local situation awareness
- Target detection, identification and tracking
- Threat warning

AERIAL RECONNAISSANCE AND CONTACT INTELLIGENCE

Real time ‘over the hill’ assessment

SPY’ COPTER

Recent military engagements involving western armed forces in different parts of the world have revealed how the use of reconnaissance mini UASs has become essential to prepare, plan and execute efficient land operations. By providing a bird’s eye view of a mission theatre, UASs have proven to be a decisive tool to ensure operational success and act as a protection bubble for the troops deployed in the field.

The development of smaller, lighter units is part of an ongoing trend which makes mini-UASs instrumental to gain tactical superiority.

Equipped with an electro-optic infrared gyrostabilized payload, Thales mini UASs (under 25 kg) allow tactical unit staff to assess a given situation, by receiving live image feeds during contact phase, rapidly processed into decision making intelligence. Thanks to their payload resolution and their long endurance, mini UASs provide long range capability to plan operations, support troops on the field during recce and contact phases, in both urban and open space areas.

SPY’COPTER IS IN USE BY THE FRENCH ARMY

All Thales micro and mini UASs are operated from the same SPY’C control/ command ground control station. The unit proved its worth in Afghanistan, with the French special forces and an infantry battlegroup.

SPY’ C

SPY ARROW

COMMAND AND CONTROL SYSTEMS

Shortening the decision loop

Making the right decision at the right time: this is the promise of modern optronic technologies deployed in the field. As such, acquiring image and video data is only the starting point. The challenge is to identify, track and engage targets within the shortest timeframe, while ensuring efficient and reliable friend-foe recognition and providing accurate data to help fully assess combat situations and make educated decisions.

By bringing together the most advanced optical, IR and laser technologies with the most powerful electronics and software, Thales provides intelligent and interoperable systems capable of performing real time image analysis. Such equipment also supports commanding bodies, as well as troops deployed in the field, to take relevant action while shortening the decision cycle.

Thales optronic sensors are operated using versatile C2 systems (command and control) that support the full range of Thales optronic cameras. To further enhance image analysis and process automation, Thales provides C4I systems (communication, command, control and computing intelligence) that operate up to six optronic devices and merge images, video and data, effectively reducing operators' work load and accelerating decisions.
For instance, target coordinates and images provided by a Sophie camera may be automatically fed into a UAV that dispatches on site to confirm the intel.

SERVICE, MAINTENANCE AND SUPPORT

Operating efficiency in the field

A complete service infrastructure has been designed to ensure optronic devices are fully operational in the field. This includes service centres in different parts of the world, as well as an efficient supply chain organisation to ensure components, parts and sub-systems are delivered as efficiently as possible, wherever they are required.

Maintenance requirements are also taken into consideration early in the product design cycle. Thales optronic products integrate features that facilitate inspection, analysis, repair and testing, as well as remote diagnosis and maintenance.

The Group also has a long standing experience in TOM agreements (transfer of maintenance), effectively providing technology, tools, training and support to clients willing to set up their own maintenance organisation.

- 10 Thales optronic service centres worldwide
- Optronic devices are supported in 54 countries

Carrying out maintenance operation in the field thanks to tablet computers: A Thales advantage

DESIGNING TAILORED SERVICE SOLUTIONS

CLEAN BUBBLE

Reduced intervention times

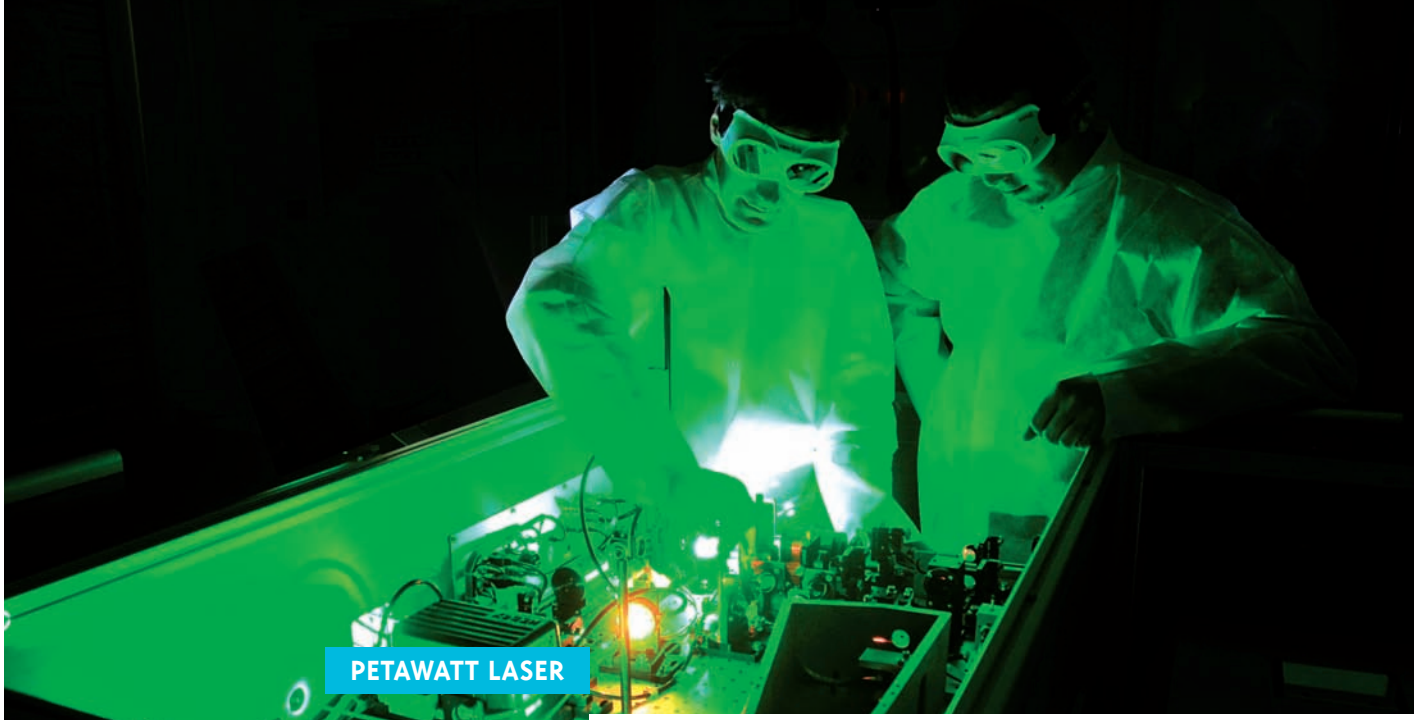
- Projection of the Thales factory closer to customers
- Compatibility with ground, aerial and naval equipments

Improvement of operational availability

- Equipment repair on the theatre of operations
- Greater autonomy for customers during field operations
- Maintenance may be performed during external operations as well as in the home country

RENTAL

For customers who want all the benefits of an imager fleet without any of the responsibility for repairs, we can rent imagers. Customers only pay for what they need and always have the latest imager technology at their fingertips. With the Sophie rental solution, customers get guaranteed 100% availability with no capital outlay.



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INNOVATION: AT THE HEART OF THALES' OPTRONIC EXCELLENCE

As the n°1 European supplier of optronic devices and technology and one of the leading players in the global market, Thales invests heavily in innovation programmes.

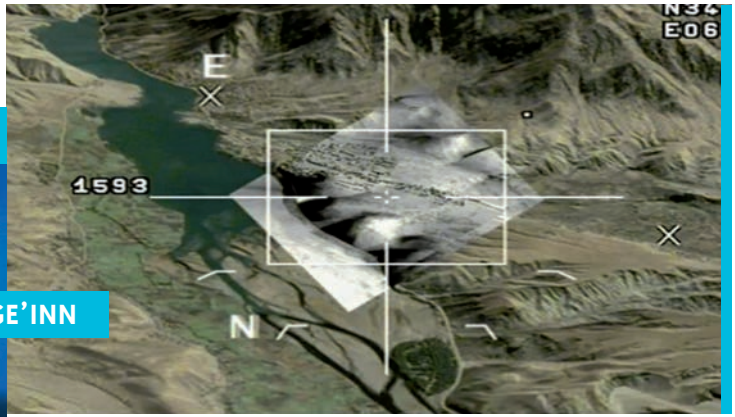
Technology is one of the core approaches of Thales' innovation hubs: for example, the Image'Inn optronic immersive lab where the customer can experience new solutions and provide input to maximise their added value.

The Group also invests in open innovation through cutting edge technological partnerships with European research centres, academic institutes and innovative SMEs. Today, Thales owns or shares a portfolio of several hundred patents in optronic technologies feeding product innovation successes such as a new light UAS with a minaturised optonic gimbal that will increase the identification range by 20 to 25%.

Thales innovation relies on the constant development of human resource knowledge and R&T expertise to offer world class leading solutions such as the Ultra High power laser for fundamental physic research or robotised space exploration.

Recognised innovation capabilities allowed Thales' optronics and missile electronics to be at the heart of key strategic French and European defence programmes such as the PDL-NG laser target designation pod, as well as the next generation missile seekers in the MICA, Exocet and ASTER.

IMAGE'INN



WHY THALES ?

A one-stop shop for land optronics

Thales offers a complete range of versatile land optronic mounted
- Ease of use between mounted and dismounted devices, from gunner sights to close combat devices
- Interconnected Thales solutions to optimise the decision making loop
- Suitable for both asymmetric and conventional battle

Full optronic system integration

- Thales is a leading worldwide supplier of electronics, network and battle management systems.
- As such Thales supplies and supports complete interoperable systems that work seamlessly with other surveillance or weapon systems on land, sea or in the air.

Full control over the supply chain

- Core technologies and components of Thales optronic products are designed and manufactured in-house.
- Thales therefore masters the entire supply chain and controls both the quality and availability of all critical components reducing supplier risk.

Free from US export control technology

- Thales Optronic devices, electronic systems and networks use full ITAR-free components.

Worldwide support and maintenance

- Thales offers a support and maintenance infrastructure with a worldwide reach
- The company is also open to transfer of maintenance/ production/technology agreements

Diversified business models

- Thales offers a wide variety of business models, including pay-per-use and pay-per-image propositions.
- Already widely initiated in the airborne optronic field, this trend is developing in the land optronic market and will help armies switch from investment to operating budgets.

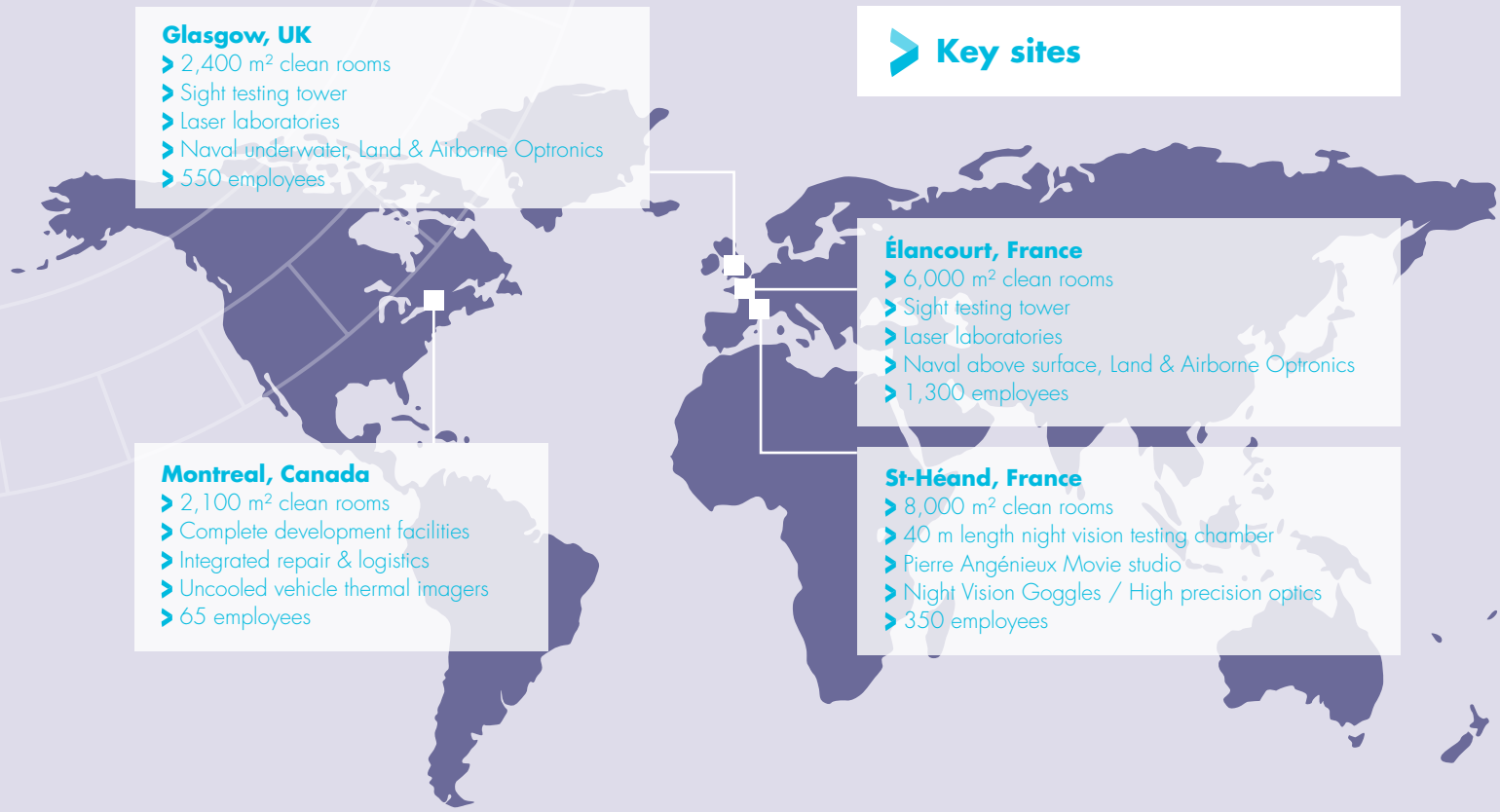
THALES KEY FACTS

1. A leading supplier of land optronics
2. 40 years of operational experience
3. World-class laser technology

THALES' OPTRONICS BUSINESS

N°1 European supplier and one of the world's most prominent providers of innovative and field proven optronic devices for land, sea, air and homeland security applications.

Thales' Optronics Business operates 10 sites in 6 countries and has 2,300 employees. 20% of its revenue are reinvested into its R&D programmes.



4 Recognised expertise in data-link, navigation and image processing

5 Open architecture for development headroom

6 Easy-to-use mission planning tools and intuitive user interface

7 Optimised maintenance and customised logistic support services

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THALES

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