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## SENSORS AND ELECTRO-OPTICS

identifying  
imaging  
**together, we**  
sense and respond

## Contents

safeguarding people and assets **1**

our products and solutions **3**

our company **7**

# safeguarding people and assets

Our state-of-the-art radar, microwave sensors and electro-optic solutions are widely used for surveillance purposes to safeguard key installations and human lives.

Surveillance has far-reaching implications for a nation's defence sector and public safety agencies. For commercial organisations, surveillance is critical in sustaining business continuity and protecting infrastructure as well as physical, corporate and human assets.

Singapore Technologies Electronics (ST Electronics) has developed an impeccable track record of delivering innovative, broadband wireless communications and sensor solutions that enhance connectivity and safety, for customers in over 80 countries.

Our state-of-the-art radar, microwave sensors and electro-optic solutions are widely used for surveillance purposes to safeguard key installations and human lives. These applications cover an extensive range of market segments,

including industrial automation, intelligent building, transportation and traffic management, homeland security, government and defence.

Based on a customer-centric culture and backed by investment in research and development, ST Electronics designs, produces and markets innovative and cost-effective surveillance products and applications to customers worldwide.

ST Electronics' sensor and electro-optic products and solutions are provided through our subsidiaries, ST Electronics (Satcom & Sensor Systems) Pte Ltd and STELOP Pte Ltd.



Electro-optic solutions

## our products and solutions

Our microwave sensor modules are reputed for their cost-effectiveness and reliability.

### Sensors

#### Microwave Sensors

Marketed under the AgilSense brand, our microwave sensor modules are reputed for their cost-effectiveness and reliability. They are widely used by OEMs worldwide in detection systems for applications in industrial sectors, such as security, automotive, automatic doors, industrial control, as well as intelligent buildings and traffic management. Their popularity also extends to usage in robotic and unmanned platform applications.

Our modules are designed with solid-state planar technology and microstrip patch antenna array that caters for low power consumption, high sensitivity and flat profile features.

Apart from a full range of off-the-shelf products, ST Electronics also designs and customises microwave sensors to meet customer requirements.

Our K-band sensor, with its Low Noise Amplifier and pre-amplifier for higher sensitivity, is ideal for long-range motion detection.

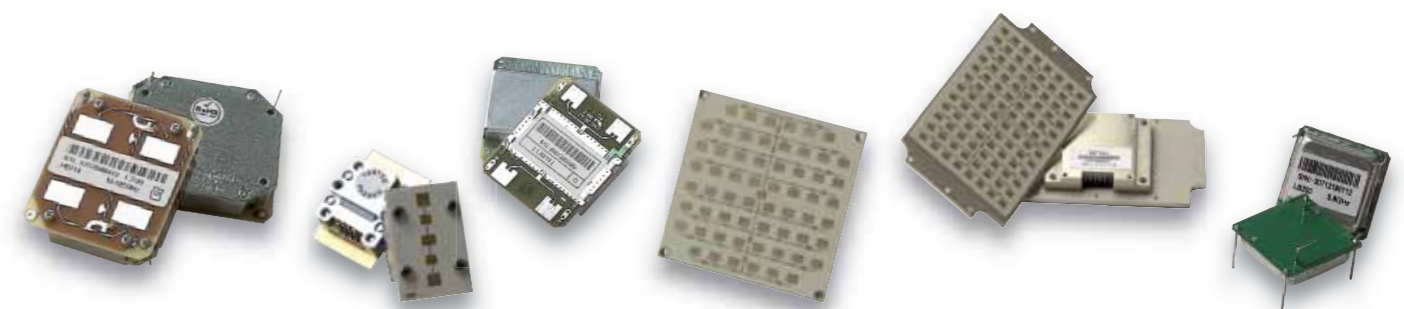
#### Wireless Sensor Networks

ST Electronics' Wireless Sensor ad-hoc meshed network helps our customers manage their security, long-term monitoring and surveillance issues.

The Wireless Sensor is interfaced either through communication nodes or directly via a cluster node to a command centre interface. Designed for ease of use and implementation, it can be effortlessly integrated with a variety of systems, such as a single source reconnaissance CCTV or a ruggedised personal computational device.

With its ability to provide critical, real-time information to a remote command centre, the Wireless Sensor is ideal for identifying and classifying intrusions, as it empowers quick and incisive decision making. For maximum mobility, it can be interfaced with mobile equipment to provide real-time support.

The Wireless Sensor is typically used in combination with other sensors for the surveillance of borders, no-man-zones, harbours and other security areas. Areas or borders with limited line of sight or heavy terrain can also take advantage of the air deployment capabilities.



Microwave sensor modules

## our products and solutions

ST Electronics develops sophisticated border/coastal surveillance systems that help government agencies protect their borders and coasts.

### Radar Surveillance Systems

ST Electronics' spectrum of radar surveillance systems is specifically designed to provide reliable and automated surveillance around the clock, ensuring safety and protection of key installations and assets.

Leveraging advanced surveillance radar technologies, our 3<sup>rd</sup> Generation Surveillance & Sensor Suite (3G-3S) is the most comprehensive system for coastal surveillance that is fully integrated with maritime operations and security functions. It features vessel traffic information and radar sensors and is able to detect and track illegal intrusions and terrorist activities. Its command and control capabilities also allow it to function effectively as a crisis management platform, handling emergency events such as search and rescue, oil spills, piracy and terrorist attacks.

The 3G-3S comprises Intelligent Vessel Traffic Systems (iVTS), Intelligent Command Management System (iCMS) and Intelligent Surveillance Management System (iSMS). Network-centric and scalable, the systems deliver effective and affordable surveillance, tailored to our customers' needs.

In line with our commitment to provide total customer satisfaction, our experienced product engineering and customer support teams are always at hand to offer product support and services.



Radar surveillance

### Electro-Optic (EO) Solutions

#### Border/Coastal EO Surveillance Systems

ST Electronics develops sophisticated border/coastal surveillance systems that help government agencies protect their borders and coasts against terrorists, illegal immigrants and smugglers, while facilitating the flow of authorised passengers and cargo.

Some of these cutting-edge systems include the Long Range Reconnaissance and Observation System (LORROS) that provides long-range day and night detection and identification of targets. The fixed Security Remote Observation System (SeROS) provides comprehensive surveillance and alerts for protected premises.

The Mini-Turret is used on mobile platforms and handheld thermal imagers to allow for quick and accurate searches at detected intrusion locations while the Laser Gated Intensified Charged Coupled Device (LGICCD) instantly identifies and recognises intruders.

Integrated by command and control centres, these systems enable the effective and economical use of response and intervention forces. Our complete surveillance solutions give our customers peace of mind by providing surveillance situation awareness 24x7.



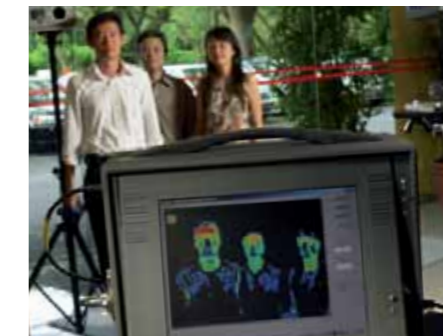
Coastal surveillance

### Airport/Base Surveillance Systems

Air travel has been experiencing steady growth and the trend is set to continue. This makes airport security a first line of defence against terrorism, crime and potentially deadly outbreak of diseases such as SARS.

ST Electronics is a pioneer in airport screening systems. Our BIOSENS explosive and drug machine screens and prevents the introduction of explosives and drugs into the airport. The award-winning Infrared Fever Screening System (IFss) was first launched at the height of the SARS epidemic in Singapore in 2003, allowing fast and real-time mass screening of people for fever.

Apart from security within airports, ST Electronics also supplies airport perimeter security systems which prevent intrusion and terrorist threats surrounding runways, as well as foreign objects within the landing/take-off perimeter. Day and night perimeter control is achieved with our SeROS system, which can be installed on towers, buildings, masts and integrated to electronic fence alarm systems. Our uncooled thermal imagers highlight people, property and vehicles in total darkness and through haze, dust and smoke.



Infrared Fever Screening System

### Weapon/Fire Control EO Systems

At ST Electronics, we tap on state-of-the-art EO technology to customise innovative Weapon and Fire-Control EO solutions for our customers.

Our Uncooled Thermal Sighting System (URALIS), mountable on weapons and mobile platforms enables quick target detection and accurate weapon firing. The Thermal Night Imaging System (TNIS), a day and night target observation and tracking device, has a range of more than 5km, and our Day/Night Vehicular Sighting System (DNVSS) is a sophisticated Sighting and Fire Control System for vehicular platforms, providing high accuracy and excellent reliability under all weather conditions.

ST Electronics provides the perfect balance between stealth and visibility through advanced solutions.



URALIS Uncooled Thermal Sighting System

## our products and solutions

The ST Electronics Soldier EO Systems are personalised and possess thermal cameras which are easily carried and operated by individual soldiers.

### Soldier EO Systems

EO systems protect soldiers by enabling them to view the battlefield from a relatively safe distance or position while gaining critical information about the scene, particularly at night.

The Soldier EO Systems are personalised and possess thermal cameras which are easily carried and operated by individual soldiers.

NEMIS offers high recognition range with low power consumption and high reliability, while CORIS is a low-cost, portable uncooled thermal imaging camera designed specially for para-military applications.

### Stabilised Payloads

ST Electronics has developed a wide array of stabilised EO payloads for fixed and rotary wing aircraft, Unmanned Aerial Vehicles (UAVs), naval platforms, Unmanned Service Vehicles (USVs) and ground applications. These provide optimal observation, surveillance, tracking and targeting capabilities under even the toughest conditions.

Airborne payloads are optimised for air missions and are configured for a large spectrum of airborne platforms, including helicopters, light and combat aircraft and UAVs.

On the coast, patrol craft equipped with our stabilised payloads experience stabilised high-definition long-range day and night vision.

Another of our advanced lightweight stabilised day/night surveillance systems is the Mini-Turret. Designed for unstable surface platforms, it delivers optimal performance for land vehicle, telescopic mast and marine usage.

## our company

Our solutions are strategically targeted at the e-Government, Satellite Communications, rail and highway intelligent transportation and Interactive Digital Media markets.

Headquartered in Singapore, ST Electronics has over 40 years of experience in providing electronics, communications and Information Communications Technologies (ICT) solutions to governments and commercial enterprises worldwide.

Our strength lies in our ability to harness leading-edge technologies into products and solutions, which are both innovative and cost-effective. Our solutions are strategically targeted at the e-Government, Satellite Communications, rail and highway intelligent transportation and Interactive Digital Media markets.

A truly global company, ST Electronics has established an international presence in more than 30 cities in 20 countries. We have offices in Bangladesh, Botswana, China

(including Hong Kong), Europe, India, Kazakhstan, Malaysia, Mexico, the Gulf States, South Africa, Taiwan, Thailand and the US, serving a customer base that spreads over more than 80 countries.

ST Electronics is a wholly-owned subsidiary of Singapore Technologies Engineering Ltd – one of the largest public-listed companies on the Singapore Stock Exchange.



CORIS Uncooled Handheld Thermal Imager

## our company

### Awards and Patents

Our values and work attitude have earned us extensive industry approval and recognition, as demonstrated by some of our accolades. ST Electronics strives to build and strengthen its strong innovative spirit. We continually invest in research and development and have been granted numerous patents for our innovations.

### Awards

- The Infrared Fever Screening System (IFSS) jointly developed by ST Electronics and DSTA –
  - The US Tech Museum Award 2004 (Health Category)
  - TIME Magazine’s “Coolest Invention of the Year 2003”
  - ASEAN Outstanding Engineering Achievement Award 2003 (AOEAA) and the IES Prestigious Engineering Achievement Award 2003 (IESPEAA) – SARS, Combating Innovations: IFSS & Contact Track & Trace

### Patents

- Method and Apparatus for Measuring Temperature of a Body – Singapore and Australia (2008)
- Motion Detector – Singapore (2002), Taiwan (2001) and the US (2004)
- Combined Motion Detector and Shock Sensing Apparatus – Singapore (2002) and UK (2002)

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