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DEFENCE AND HOMELAND SECURITY

integrated security
unrivalled intelligence
together, we offer
peace of mind

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equipping a new generation of fighting forces

ST Electronics is a pioneer and leader in defence electronics, capitalising on our technological expertise and unmatched experience in defence technologies to provide a new generation of defence equipment, systems and solutions.

The fast-changing world of today has spawned new challenges in defence and homeland security. With a volatile political climate and heightened security threats, Defence and Homeland Security forces have to constantly reinvent themselves and upgrade their capabilities in order to ensure a secure and peaceful landscape for their citizens.

Advances in technology have led to exponential improvements in defence capabilities in the area of Command, Control (C2), Communications and Computers (C4); Intelligence, Surveillance and Reconnaissance (ISR) and simulation.

ST Electronics is a pioneer and leader in defence electronics, capitalising on our technological expertise and unmatched experience in defence technologies to provide a new generation of defence equipment, systems and solutions.

ST Electronics' Defence and Homeland Security solutions are provided through our core business groups, the Large-Scale Systems Group, and our subsidiaries, ST Electronics (Info-Comm Systems) Pte Ltd, ST Electronics (Info-Software Systems) Pte Ltd, ST Electronics (Training & Simulation Systems) Pte Ltd, ST Electronics (Satcom & Sensor Systems) Pte Ltd and STELOP Pte Ltd.



Integrated C41 solutions enabling Command on the Move

our systems and solutions

Defence C4ISR

ST Electronics offers an integrated C2 system with advanced communication and computers as well as ISR systems to provide comprehensive C4ISR solutions which empower commanders with unrivalled superiority in situation awareness and decision-making for missions. Our 'system of systems' integration approach optimises resources management and mobilisation on a real-time basis.

We design and integrate C4ISR systems for an array of platforms. These C4ISR systems, including vehicle navigational systems, computers, communications and surveillance systems and sensors, are customised and fully integrated with Command, Control & Communication (C3) equipment for responsive decision-making. Our C4ISR systems are built with interoperable communications and mobility, a priceless advantage on the battlefield.

For seamless and interoperable communications among various forces equipped with diverse communication systems, our award-winning Superne™ OneHub® Integrated Communication System (OneHub® ICS) ST6800 provides interoperability and powers these C4ISR systems enabling commanders to carry out effective command, control and coordination during mission planning and incident management. Extensive line, radio and satellite communication

resources can be integrated to provide clear and effective voice, data and multimedia communications while on the move, making it an ideal choice for military users.

ST Electronics develops advanced soldier systems that enhance a soldier's situational awareness, survivability, lethality and sustainability. The soldier systems enable networking with other C4ISR or fighting platforms, increase combat effectiveness and the soldier's ability to call for support from air, land and sea. With open architecture and a modular design to suit different mission requirements, our soldier systems are easy to maintain and provide minimal combat load with extended operating duration.

Mobility is key in all operations. Our next generation Mobile C4I System (MCS) solution provides unrivalled connectivity and C2 capabilities, with full interoperability from command centres to ground units. Likewise, our proprietary Battlefield Management System (BMS) enables commanders to make responsive decisions in a fast-changing environment. An integrated combat management system, the BMS realises the full spectrum of network centric capabilities in the tactical environment to provide an accurate and detailed situation picture, collaborative planning tools and knowledge-based C2 for superior warfighting capabilities.



Battlefield Management System

Communications

The success of any military operation hinges on the availability of accurate and timely information. ST Electronics focuses on optimising air, land and sea communications for C4 systems for defence forces, leveraging advanced wireless and wired network solutions.

We offer integrated solutions for wide area tactical networks, through both terrestrial and non-terrestrial communications systems which are customised to ensure seamless communication between defence forces that operate on different spectrums and/or diverse communication systems. The networks are designed for secured and resilient communications for voice, data and video transmissions across several strata of command.

ST Electronics' advanced solutions and technologies range from military communication networks to commercial technologies such as WiFi and WiMAX adapted for military use. We also harden and ruggedise Commercial-Off-The-Shelf (COTS)-based systems to meet the challenges of the military operating environment.

Our tactical systems include software-defined radios, handheld programmable radios, aerial communication networks, intelligent unmanned vehicle and data communications.



Superne™ OneHub® Integrated Communications System (OneHub® ICS)

Surveillance and Tracking

ST Electronics' experience in defence C4ISR systems has enabled us to develop superior surveillance and tracking systems for defence and homeland security applications. Designed for a wide variety of day and night uses for both surface and underwater operations, our surveillance systems are ideal for coastal, border, and defence surveillance, as well as protection of key installations.

We deliver autonomous and unmanned systems such as UGS (Unmanned Ground Sensors), to enable system operators to control remote sensors through communication networks, and to integrate real-time information for decision-making, incident management, asset optimisation and simulation.

Our electronic warfare solutions empower military forces with detection, protection and spectrum monitoring capabilities. Backed by two decades of experience, we offer consultancy and solutions for real-time interception, comprehensive surveillance and intelligence, and locating of radio, GSM, WiFi, Internet, radar and satellite facilities. We also provide solutions to meet the demands of enhanced safety for troops and security agencies against Radio Controlled Improvised Explosive Devices threats.



Ruggedised Wireless Communication Devices (photograph courtesy of Pioneer magazine)

The Advanced Combat Man System provided for the Singapore Armed Forces by ST Electronics integrates the soldier as part of a network-centric force



ST Electronics is a comprehensive, one-stop simulation and training instrumentation provider, having equipped defence forces globally with customised solutions for over 30 years.

Defence Simulation

Defence training is often a thorny situation as real-life locations are often neither feasible nor practical for such purposes. Simulation is recognised as an effective, and in some cases the only feasible alternative, to actual ground training. Such facilities and solutions provide realistic scenarios and terrains for trainees to hone their skills and competencies safely.

ST Electronics is a comprehensive, one-stop simulation and training instrumentation provider, having equipped defence forces globally with customised solutions for over 30 years. Our end-to-end services cover consultancy, maintenance and after-sales service for our live, virtual and constructive training systems, including legacy systems.

Our cutting-edge technologies translate into cost-effective simulation solutions with short time-to-product cycles and a scalable and future-proof architecture. Whether for air, land or sea, our systems are designed to reduce initial operational training cycle time, improve trainees' skills and minimise equipment obsolescence.

ST Electronics' simulators have played a central role in flight operations. Our flight simulators provide highly realistic scenarios for military training while our 360-degree Air Traffic Control (ATC) aerodrome simulator features high-end project imagery and an integrated voice communication network to enable trainees to hone highly specialised skills in ATC operations and procedures.

On land, our Armoured Gunnery and Tactical Simulator (AGTS) is a classic representation of our innovation. As the first High Level Architecture (HLA) compliant simulation system in Singapore, it provides gunnery training for a variety of platform/weapon systems to hone the skills of trainees.

Similarly, our Virtual Reality Infantry Training System (VRITS) is one of the first in the world to integrate infantry gunnery with tactical training. It is a holistic infantry battalion training system that revolutionises the way infantry commanders and troops train.

Likewise, our naval applications enjoy a high standing among defence forces. We are the first manufacturer in Asia to be awarded a Letter of Compliance from Det Norske Veritas (DNV) for our Trident Full Mission Ship Handling Simulator (FMSS). The Trident FMSS has also been certified to comply with DNV Class 'A' Bridge Operation standard (the highest attainable grade). This is a testament to our expertise in designing and building simulators that stand up to international standards.

Complementing our capability in providing simulation solutions for training is our traffic simulation solutions which can be customised for defence forces to conduct traffic flow simulation, incident impact analysis and plan validation via an expert system application for enhanced mission planning and asset deployment.



Armoured Gunnery and Tactical Simulator



Trident Full Mission Ship Handling Simulator

our systems and solutions

Defence System & Product Engineering System Engineering

ST Electronics provides Combat Systems Integration (CSI), real-time software development, and the design of advanced electronic systems for naval, air defence and civil aviation applications. Our involvement in major platform building and multi-CSI programmes cover the full spectrum of activities from front-end studies, generation and translation of requirements into specifications, design and development, installation, test and evaluation of systems with the platforms.

Tapping on tried and proven methodology and advanced COTS technologies, we integrate customised system solutions across a wide spectrum of operating domains and applications. These systems range from Unmanned Surface Vehicles and air defence weapons systems to high resolution recording systems for live firing evaluation for naval and air defence, and tactical scenario evaluation and analysis systems for naval platforms.

From consultancy, design, development and production to system integration, maintenance and system upgrade, we integrate all processes and systems which are crucial and critical to our customers.



Standard Operating Command & Control Console

Product Engineering

ST Electronics offers high quality electronic and mechatronic products, as well as the ruggedisation of COTS systems and sub-systems. We adapt COTS equipment to withstand harsh environments and conditions required by demanding military standards. These include multi-function operator consoles, rugged displays and computers that are customised and further integrated with naval, land and air platforms.

Our ruggedised vehicular computers optimise space usage in military vehicle applications. They are highly adaptable to a wide range of vehicle platform integration and are ideal for use in tracked and wheeled vehicles. Leveraging our expertise in ruggedisation and mobile computing, we also offer Ruggedised Computing Devices (RCDs) empowered with position reporting and navigation capabilities which provide data communication with multiple external devices that can be fully integrated with any wireless network.

Our flexible and modular approach enables quick response to technological enhancements and ensures continual functionality and flawless integration.



The Venus Unmanned Surface Vehicle is re-configurable for multi-missions

ST Electronics utilises advanced technologies to deliver new generation emergency response systems that aid homeland security agencies in their response to and management of emergencies.

Homeland Security

A volatile landscape has led to the tightening of security at key sites such as airports, seaports, central business districts, tourist attractions, education institutions and major infrastructures. ST Electronics utilises advanced technologies to deliver new generation emergency response systems that aid homeland security agencies in their response to and management of emergencies.

Security & Control

For effective and mobile command, control and communications, our purpose-built Integrated Command and Communication Vehicles (ICCV) are the ideal solution. Integrating complex, large-scale and interoperable communication and surveillance systems, the ICCVs serve as versatile C4 centres that can be easily and quickly deployed for on-site mission planning and management of emergency situations.

These vehicles are available as Mobile Command Hub (MCH) for easy manoeuvring and quick deployment during large-scale disasters and emergencies. Our MCH is expandable to twice its closed configuration to accommodate effective on-site mission planning and crisis management. The Taiwan National Fire Agency is one such customer that uses the MCH to speed up rescue work during typhoon incidents in Taiwan.

At the heart of these solutions lie our homegrown, field-proven Superne™ OneHub® ICS ST6800 and eNotification system. This system seamlessly integrates wired and wireless communication systems to create a

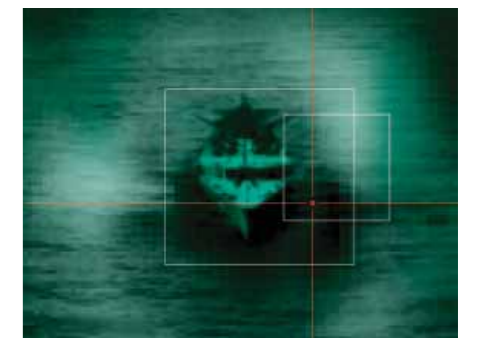


Expandable Mobile Command Hub

unified communication network for both fixed and mobile communication centres, allowing interoperable communication between disparate systems. The eNotification system can be deployed during major events or emergency situations to deliver rapid and accurate messages to thousands of people within a short time.

ST Electronics has successfully implemented a nation-wide integrated mission-critical C3 infrastructure network for the Singapore Police Force, the Singapore Civil Defence Force and the Central Narcotics Bureau to enable these agencies to work cohesively as one integrated entity to safeguard the security of the nation. The network links the voice and data networks of various command centres, police stations, hospitals and fire stations located island-wide and enables seamless communication and enhanced coordination between the agencies during a crisis.

We also develop sophisticated C2 systems for para-military and homeland security forces. SecurePort was designed to address unique port and coastal security needs while adhering to International Maritime Organisation (IMO) International Ship and Port Security (ISPS) code requirements. With SecurePort, operators are immediately alerted to potential security threats and automatically recommended the best course of action. The system's ability to provide high levels of intelligence and automation has significantly reduced the need for valuable security manpower resources at ports and key installations.



Coastal surveillance solution addresses port and coastal security needs

our systems and solutions

Our C2 systems have been specifically developed to meet the needs of homeland security forces. The Third Generation Mobilising System facilitates the efficient and timely mobilisation of fire and ambulance resources during emergencies and caters to the projected growth of emergency calls. The Police Resource and Incident Management System provides critical support to the police force by facilitating intelligent decision-making and effective deployment of the best resources available, boosting call response time to incidents of crime.

ST Electronics' innovative solution for airport safety, the intelligent Airport (iAirport), is a C4I system that provides ATC aerodrome controllers with enhanced situational awareness. It incorporates decision support tools for faster and more accurate decision-making and improves airfield surface safety, increases and maximises airport capacity, and reduces the workload of controllers.

Leveraging our expertise in designing and planning radio networks, we have developed cost-effective and comprehensive radio network solutions for customers in the public safety domain. We also provide reliable, integrated multimedia, end-to-end digital transmission networks using fibre optic cables, for transporting voice and data communications between stations and operation command

centres. Our communications expertise extends to tunnel communications, using a Fibre Optic Radio Frequency Repeater system for the distribution and coverage enhancement of critical two-way communications signals.

Integrated Security and Surveillance
ST Electronics makes use of a wide variety of sensors to offer revolutionary surveillance systems to enhance security at critical sites and key installations. When integrated with communication systems, these surveillance solutions assume a critical role of monitoring and tracking targets and assets, as well as providing real-time information for better decision-making and incident management.

Our award-winning GPS and GPRS-based Harbour Craft Identification and Monitoring System (HMS) is a prime example of a cost-effective and efficient tracking solution that enables authorities and agencies to identify, monitor and track vessels and harbour crafts around coastal waters. The HMS has been implemented by the Maritime and Port Authority of Singapore for real-time tracking of vessels via transponders. Complementing the HMS is our coastal surveillance system, a multi-sensor remote coastal surveillance and warning system that enables users to direct, monitor and report incidents of sea-borne intrusion through the integrated C2 incident management system.

ST Electronics makes use of a wide variety of sensors to offer revolutionary surveillance systems to enhance security at critical sites and key installations.

On land, our SecurNet System protects facilities and major buildings. An advanced and powerful integrated security management system, SecurNet is highly scalable and provides high security access control management based on contactless smart card and fingerprint technologies.

ST Electronics' suite of tracking solutions provides accurate positioning readings on the street as well as in buildings or locations covered by foliage or blocked by tall buildings allowing it to effectively track and communicate with any mobile object. It offers real-time positioning with two-way messaging, ideally suited for emergency and security applications such as asset tracking, remote data collection, stolen vehicle recovery, emergency and medical distress and roadside assistance.

We offer the latest technology in wireless smart sensor network that is applicable to a plethora of homeland security and military solutions. This cost-effective solution enables sensors, actuators, programmable logic controllers or portable devices to be connected in an intelligent network configuration, providing bi-directional, reliable and efficient control of data, processes and assets, automatically and in real-time. Applications include two-way sensor data collection and management, location of mobile assets

and people within the network, wireless ad-hoc sensor networks, wireless remote monitoring of key installations as well as total asset visibility.

Intelligent Transport Security
ST Electronics understands that crippling a country's transportation assets and infrastructure can have disastrous implications. To help homeland security agencies and the military safeguard such assets, we offer an Integrated Transport Security Management System (i-TranSec) that enhances the command and control of mobile resources in the field.

i-TranSec provides a common platform to consolidate data from individual traffic systems and fleet management systems, monitor and control traffic junctions. It automates detection and monitors traffic incidents, integrates communications, ensures effective enforcement, enables mass notification to mission commanders and homeland security agencies; an ideal solution for full asset visibility.



Integrated Mission Critical C3 Infrastructure Network



Third Generation Mobilising System provides efficient resource planning during emergencies



Integrated Transport Security Management System

our systems and solutions

System Support, Services and Information Assurance

System Support and Services

Providing comprehensive, end-to-end support is a hallmark of ST Electronics' solutions. With a dedicated team of engineers and technicians, fully equipped competency centres and superior in-house depot level maintenance facilities, we offer a complete range of services from system requirements and definitions, design and development, implementation, and integrated life-cycle support to ensure seamless integration and operation of multi-disciplinary systems.

Our in-house Customer Service Centre offers 24x7 on and off-site maintenance services, supported by world-class facilities such as the Instrument Calibration Centre (ICC) and the Automatic Test Equipment (ATE) Centre that provide calibration and repair of test and measuring equipment, printed circuit board assembly and electronic modules. Our capabilities in system and product engineering and integrated logistics services are constantly upgraded and developed to ensure that we bring only the latest and the best offerings to our customers.

With increased usage of electronic devices and mobile wireless communication, information security is critical to both defence and homeland security agencies. Our facilities and unrivalled expertise in the field of Electromagnetic Interference (EMI)/ Electromagnetic Compatibility (EMC)

enable us to deliver a full range of EMI/ EMC solutions, while consultancy and comprehensive military and commercial standard testing services complete the spectrum of services, making us a convenient one-stop service for EMI/EMC solutions. We also help protect against unauthorised interception of classified or sensitive data and the impairment of mission critical electronic systems.

Information Assurance

ST Electronics' info-assurance team provides and ensures that critical information is protected, secure and transferred reliably. We specialise in the design, development and manufacturing of advanced info-assurance products for the protection of data-in-motion, data-at-rest, as well as digital authentication.

With an experienced and competent research and development team, we offer the best-of-breed DigiSAFE brand. These include hardware-based full disk encryption (FDE), USB authentication tokens for identity management and hardware encryption devices for securing phone, fax, data and IP networks. We also custom build high assurance products and security applications, designed to meet the most stringent demands for military and government deployments.

To offer a total security solution, we provide design, consultancy, integration and deployments of enterprise infosecurity infrastructure and develop security applications to protect the digital assets in operations.

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.



Electromagnetic Interference / Electromagnetic Compatibility Solutions



Automatic Test Equipment Centre

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 our strong innovative spirit. We continually invest in research and development and have been granted numerous patents for our innovations.

Awards

- Institution of Engineers, Singapore (IES) Prestigious Engineering Achievement Awards 2009 for 'Expandable Mobile Command Hub'
- Various ST Electronics subsidiaries were awarded the Distinguished Defence Partner Award and the Meritorious Defence Partner Award in 2009 and 2008 by MINDEF for consistent support for the Nation's Total Defence
- Minister of Defence Award 2007 for Outstanding and Consistent Support and Unwavering Commitment towards the Nation's Defence
- Defence Technology Prize for New Frigate Programme (2007)
- Congrès de la Radiocommunication Professionnelle (CRP) 2007 Product Trophy for SuperneT™ Radio Gateway ST2860
- Boat Asia 2007 Innovation Award for Harbour Craft Identification and Monitoring System

- Asia Pacific ICT Awards 2006 – Merit (Security Category) for StegMark® Brand Compact Flash Card
- Institution of Engineering & Technology (IET) Innovation in Engineering Awards 2006 (Security Category) for the StegMark® ImageLite product
- PC Professional Test Labs' Best in Security Product Award at Computex Taipei 2006 Expo for DiskCrypt
- Defence Technology Prize for Landing Ship Tank programme in 2001

Patents

- Uninterrupted VOIP Radio Gateway Services through Clustering (2009)
- Redundant Power Supply for Power-Over-Ethernet (2008)
- Method and device for protecting data stored in a computer device (2007)

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