



Profile

2017/18



Image: Lockheed Martin Aeronautics

Financial Highlights

CONSOLIDATED

| DKK million | 2017/18 | 2016/17 | 2015/16 | 2014/15 | 2013/14 |
|--|--------------|--------------|--------------|--------------|--------------|
| Key figures: | | | | | |
| Order intake | 1,728 | 1,411 | 1,671 | 1,394 | 1,455* |
| Order backlog, year-end | 2,374* | 2,431* | 2,739* | 2,567* | 2,507* |
| Revenue | 1,785 | 1,719 | 1,499 | 1,308 | 1,137 |
| EBITDA before special items | 298 | 288 | 220 | 174 | 159 |
| Special items | (31) | 0 | 0 | 0 | 0 |
| EBITDA | 267 | 288 | 220 | 174 | 159 |
| Depreciation, amortization, and write-downs | (149) | (147) | (107) | (74) | (75) |
| Operating profit | 118 | 141 | 113 | 100 | 84 |
| Operating profit before special items | 149 | 141 | 113 | 100 | 84 |
| Financial income and costs | (25) | (21) | (28) | (29) | (30) |
| Earnings before special items and tax | 124 | 120 | 85 | 71 | 54 |
| Earnings before tax (EBT) | 93 | 120 | 85 | 71 | 54 |
| Profit for the year | 72 | 91 | 66 | 53 | 53 |
| Non-current assets | 935 | 899 | 839 | 796 | 788 |
| Current assets | 1,084 | 892 | 862 | 763 | 714 |
| Total assets | 2,019 | 1,791 | 1,701 | 1,559 | 1,502 |
| Equity | 664 | 562 | 572 | 491 | 490 |
| Subordinated loans | 125 | 125 | 0 | 0 | 0 |
| Capital base** | 789 | 687 | 572 | 491 | 490 |
| Provisions | 165 | 146 | 149 | 127 | 123 |
| NIBD (excl. subordinated loans) | 489 | 306 | 418 | 389 | 431 |
| Cash flows from operating activities | 5 | 283 | 120 | 133 | 50 |
| Cash flows for investing activities | (188) | (206) | (139) | (81) | (77) |
| hereof investments in property, plant, and equipment | (92) | (133) | (70) | (35) | (28) |
| Cash flows from financing activities | 105 | (36) | 17 | (67) | (47) |
| Total cash flows | (78) | 41 | (2) | (15) | (75) |
| Financial Ratios: | | | | | |
| EBITDA margin before special items | 16.6 | 16.8 | 14.6 | 13.3 | 14.0 |
| EBT margin before special items | 7.0 | 7.0 | 5.7 | 5.4 | 4.7 |
| Return on investments before special items | 8.0 | 8.2 | 7.0 | 6.6 | 5.9 |
| Liquidity ratio | 161 | 135 | 135 | 139 | 159 |
| Solvency ratio (capital base) | 39.0 | 38.4 | 33.6 | 31.5 | 32.6 |
| Return on equity | 11.8 | 16.1 | 12.5 | 10.8 | 11.4 |
| Leverage ratio | 1.8 | 1.1 | 1.9 | 2.2 | 2.7 |
| Average number of full-time employees | 1,398 | 1,257 | 1,174 | 1,117 | 1,065 |

* including framework agreements, e.g. the F-35 Joint Strike Fighter program.

** Capital base is defined as equity and subordinated loans.

Financial ratios are calculated in accordance with "Recommendations and financial ratios" of the Danish Finance Society, except for EBITDA margin before special items, EBT margin before special items, and return on investments before special items.

Definitions to Financial Highlights

| | | | |
|---|---|----------------------------------|--|
| EBITDA margin before special items: | $\frac{\text{EBITDA before special items}}{\text{Revenue}} \times 100$ | EBT margin before special items: | $\frac{\text{Earnings before special items and tax}}{\text{Revenue}} \times 100$ |
| Return on investments before special items: | $\frac{\text{Operating profit before special items}}{\text{Average operating assets}} \times 100$ | Operating assets: | Total assets less cash at bank and in hand, other interest-bearing assets, and equity interest in affiliated companies |
| Liquidity ratio: | $\frac{\text{Current assets}}{\text{Current liabilities other than provisions}} \times 100$ | Solvency ratio: (Capital base) | $\frac{\text{Capital base}}{\text{Total liabilities at year-end}} \times 100$ |
| Return on equity: | $\frac{\text{Profit for the year}}{\text{Average equity}} \times 100$ | Leverage ratio: | $\frac{\text{NIBD (excl. subordinated loans)}}{\text{EBITDA}}$ |



Highlights of the year 2017/18

- The Danish Center of Emergency Communication has awarded a contract to Terma for the delivery of a Radio Dispatch system including service and maintenance to the Danish National Police. The new system replaces the version that Terma delivered in 2013. The new Radio Dispatch will provide 24-hour service to approx. 100 simultaneous users at 15 of the National Police' control and operations centers.
- As part of the EU-funded project OCEAN2020, led by Leonardo and comprising 42 partners from 15 European countries, Terma will contribute to the consortium within areas of interoperability requirements analysis, system design, decision support analysis, and operator task analysis.
- U.S. Air National Guard/Air Force Reserve (ANG/AFRC) awarded Terma North America Inc. a 44.3 MUSD indefinite-delivery/indefinite-quantity contract for a 3D-Audio system for their F-16 aircraft. Work will be performed at Terma's facilities in Denmark and is expected to be completed by January 2024.
- Following a successful ESA Qualification and Acceptance Review and approval for the CRS-14 mission to the International Space Station (ISS), the Atmosphere-Space Interactions Monitor (ASIM) arrived safely at Kennedy Space Center, Florida, USA, in December 2017 to be prepared for launch.
- In December 2017, in the German federal state of Brandenburg, Terma officially went online with the first wind farm Obstruction Light Control (OLC) system based on the SCANTER 5000 series. The OLC variant of Terma's SCANTER 5202 radar system monitors the airspace over and around the wind farm and only activates the obstruction lights when aircraft are in the vicinity of the wind farm.
- The Royal Netherlands Air Force and the Belgian Defence awarded contracts to Terma for the Aircraft Audio Management System (AAMS) for their fleets of F-16 fighters. The solution has been fielded and combat proven since 2009. The advanced communications and situational awareness solution provides enhancement of the pilot's situational awareness, survivability, and reduces workload, stress, and fatigue.
- With the F-35 fighter aircraft being introduced in Europe these years, there is a growing need for establishing European regional maintenance capabilities. In order to provide best value to the F-35 program, Terma and Scandinavian Avionics teamed up to form Avionics Test Center Denmark with the aim to enhance and grow MRO capabilities towards the F-35 program with specific focus on the test and repair of F-35 avionics.
- With the Belgian Defence awarding a contract to Terma for modification of F-16 pylons to a Pylon Integrated Dispensing System (PIDS+) configuration, all of the original European Participating Air Forces (EPAF) countries – Denmark, Norway, the Netherlands, and Belgium – have now ordered the Terma PIDS+ pylons for their F-16s, and all of them are equipped with the Hensoldt AAR-60(V)2 Missile Warning System (MWS).
- Terma is expanding its activities in the U.S. by opening Terma Innovation Center - Atlanta. The new office will focus on technology development to meet our customers' emerging needs and will expand the relationship with our current partners in the Atlanta area, and not least, it will capitalize on Atlanta's position as one of the premier technology innovation locations in the U.S.
- At the 2017 People's Political Festival on the island of Bornholm, Denmark, Terma hosted a debate under the heading: Alliances in Change – Opportunities and Challenges for Denmark. The debate highlighted how the geopolitical displacements we are witnessing today affect not only our security but also the competitiveness of Danish companies and the structure of our export markets. Among the participants was Minister of Defence Claus Hjort Frederiksen as well as several prominent politicians from the Danish Parliament.
- Terma and UAE-based Al Maskari Holding agreed to establish a Joint Venture, named Terma Middle East Trading LLC, in Abu Dhabi, UAE. The partnership will operate from the Terma Middle East Trading LLC's new office in Abu Dhabi and serve as the local interface to Terma's partners, customers, and clients in the UAE.

Terma at a Glance

2017/18 IN NUMBERS

Order intake
(DKK million)
1,728
Up from 1,411



Leverage ratio
1.8
Up from 1.1



Return on investments* (%)
8.0
Down from 8.2



Revenue (DKK million)
1,785
Up from 1,719



Order backlog, year-end
(DKK million)
2,374
Down from 2,431



Capital base (DKK million)
789
Up from 687



Earnings before tax (EBT)*
(DKK million)
124
Up from 120



EBITDA* (DKK million)
298
Up from 288



* Operating profit, EBT, and EBITDA before special items of 31 MDKK

Letter from the CEO

The underlying business of Terma continued the growth from previous years with increasing order intake and revenue. The order intake of 1,728 MDKK resulted in an order backlog at year-end of 2,374 MDKK which provides for a comfortable business base in 2018/19 as well as in following years.

Revenue for the fiscal year was 1,785 MDKK compared to 1,719 MDKK the year before. 94% of the revenue was generated outside Denmark.

To ensure optimum competitiveness in the coming years on the F-35 program and to strengthen our position in the U.S. market, Terma implemented a major reorganization of the airborne and aerostructures activities in 2017. Aerostructures Manufacturing, based in Grenaa, Denmark, continues its journey to become a world-class manufacturing unit with full focus on delivering high quality products in the market for aircraft composites.

The Aerostructures and Airborne Systems Business Areas were merged into one Business Area, Aeronautics, with main facilities in the U.S. and in Denmark. The reorganization resulted in extraordinary costs of 16 MDKK.

Besides the reorganization costs, the order value of a customer program was adjusted downwards by 15 MDKK due to a decrease in sales volume. Special items therefore amounted to 31 MDKK in total, comprising the reorganization costs and the program charge.

In 2017/18, earnings before tax were 93 MDKK after special items.

In 2018/19, Terma expects a consolidated organic growth >10% in revenue. The positive outlook is based on a solid order backlog to be delivered in 2018/19. Earnings before tax (EBT) are expected to increase accordingly.

Terma is predominantly a business-to-business supplier. The U.S. and Europe will continue to be important growth markets for Terma. From an end user perspective, Terma also foresees growth in the Middle East and Asia Pacific, including India.

Another significant growth driver for Terma will be the ongoing ramp-up in the F-35 program. Negotiations with Lockheed Martin Corporation and their major suppliers continue for Low Rate Initial Production (LRIP) 12-14 orders, and frame order intake is expected to take place during 2018.

The overall strategy of Terma stands on three fundamental pillars: growing the top line, breaking the cost curve, and developing the organization. The objective of all three strategic initiatives is to ensure a profitable and sustainable growth.

At year-end, total staff was 1,458 Full-Time Employees (FTE), an increase of 120 compared to the year before. Like other high-tech companies, Terma is challenged by the general shortage of mainly software specialists.



From left:

Per Thiesen

Executive Vice President & CFO

Jens Maaløe

President & CEO

Steen M. Lynenskjold

Executive Vice President & CCO



Our business activities

Terma provides mission critical solutions for the aerospace, defense, and security industry. Terma is guided by one overall purpose: to deliver security for countries, alliances, and individuals. Security is a means to maintaining and developing prosperity and protecting human lives and sovereignty.

Terma consists of four Business Areas: Aeronautics, Space, Surveillance & Mission Systems, and Support & Services.

Aeronautics provides a full range of world-class complex composites and aerostructures, aircraft self-protection and Electronic Warfare (EW) solutions, Electronics Manufacturing Services (EMS), and 3D-Audio management solutions.

As a well-established supplier to the world's largest defense program, the F-35 Joint Strike Fighter, Terma provides major composite structures to Lockheed Martin Corporation, BAE Systems, and Northrop Grumman Corporation, sensitive electronic components to Northrop Grumman Corporation, and pylons to Marvin Engineering Company.

The Dutch and Belgian Air Forces selected Terma's 3D-Audio/Active Noise Reduction technology, and thereby joined the Danish Air Force which has been flying with our 3D-Audio systems since 2009. Furthermore, the U.S. Air National Guard signed a major multi-year agreement to upgrade their F-16s. Read more on page 23.

Space develops and supplies electronics, software, and services for satellites, space control centers, and for test and validation tasks related to development of new satellites and spacecraft.

Terma is the prime contractor for the ASIM project – the Atmosphere-Space Interactions Monitor – with the objective of measuring high altitude lightning in the upper atmosphere. The observatory was delivered to ESA and Kennedy Space Center early 2018 and was successfully launched on a SpaceX Falcon 9 launcher on 2 April 2018. Read more on pages 12-13.

Surveillance & Mission Systems provides radar systems for coastal surveillance and traffic control in sea ports and airports, radars for naval vessels as well as radars for wind turbine interference mitigation and obstruction light control. The activities also cover command, control, and communications solutions for naval vessels and air defense systems, self-protection systems for naval vessels as well as systems for security surveillance of critical infrastructures.

In the maritime domain, Terma as a technology partner to Indian company Tata Advanced Systems Ltd. is on contract for delivering the future surface surveillance radar to the Indian Navy, in the first ever "Buy and Make (Indian)" program.

The obstruction lights on wind turbines warn low flying aircraft but also cause light pollution to neighbors. By use of SCANTER radars, it is possible to only turn on the lights when an aircraft is approaching and thereby limit the light pollution significantly. Terma is the only supplier that is authorized by both the U.S. Federal Aviation Administration (FAA) and by European authorities.

The critical infrastructure protection (CIP) area had a breakthrough sale in the Middle East where Terma is on contract to protect a major VIP facility. The solution protects facilities from intruders on land and on water.

Support & Services provides maintenance, support, and update of Terma products and solutions as well as third-party OEM equipment.

Terma secured a contract with the Danish Center of Emergency Communication for the delivery of a nationwide Radio Dispatch system including service and maintenance to the Danish National Police. Read more on page 17.

The F-35 fighter aircraft will be introduced in Denmark during the coming years, and Terma is actively pursuing sustainment contracts on avionics and composites in this important program. Terma is working on these opportunities by means of partnering opportunities both in Denmark and internationally.

Since the very start of the company in 1949, Terma has maintained deep and proud roots in Denmark which remains our center as we do business around the world. Terma believes in international partnerships and strong strategic alliances.

Framed by the Market Development organization, Terma works closely with national defense forces, public authorities, international organizations, and customers around the world. Our global expansion, with the purpose of being closer to key customers and end users, continued in 2017/18 and will accelerate in the years to come.

Continuous product development is mandatory for a high-tech company. In 2017/18, Terma successfully launched a new High-Power Solid State Power Amplifier for the SCANTER 4000 radar series. This solid state technology replaces the older technology, reduces life cycle costs, and optimizes reliability.

Terma also initiated the development of a common command and control (C2) platform to ensure efficient reuse of common key functionalities across C2 product families.

Terma developed Artificial Intelligence (machine learning) in close cooperation with universities and end customers. The artificial intelligence engine strengthens intelligent automation required by the exponential growth in information and insufficient manpower and will contribute to the competitive advantage of military applications.

Based on Terma's values of working with integrity, showing passion, and working globally, Terma wishes to impact our industry and society in a positive way. A separate Corporate Social Responsibility (CSR) report for 2017/18 is published and is available at:
https://www.terma.com/static/csr_report2017-18/index.html

As Terma in April 2017 became signatory to the UN Global Compact, the report constitutes Terma's first Communication on Progress (COP), with a statement for our continued support for the UN Global Compact as well as a description of practical actions and measurement of outcomes.

On behalf of the Board of Directors and the Executive Management, I greatly appreciate the dedication, commitment, and efforts of our employees worldwide.

Yours sincerely,
Jens Maaløe
President & CEO

Growth, globalization, and digital transformation in Terma



Furthermore, the speed in technology development impacts Terma in many areas; as a global technology provider, Terma aims to stay agile and to continuously improve and develop interaction with our customers and partners and, at the same time, develop and deliver new solutions and systems that meet our customer's demands and needs of today and especially of tomorrow.

To achieve these ambitions, Terma's Executive Management has initiated the strategic program – Digital Business Transformation – with the purpose to execute a transformation of Terma related to business processes, digital solutions, and organizational development – all enabling customer centricity, scalability, and leadership.

A transformation roadmap identifying a number of prioritized transformation areas has been developed, initially setting the direction for the coming two years, well aware that developing the digital maturity will be a continued activity.

The transformation roadmap covers the full value chain of Terma and is an outcome of a cross-functional driven process, taking off in recommendations from process owners as well as the global management. An example of a transformation area is in our production, where we will digitalize the documentation.

The globalization of Terma and changing the way we work require a transformation ready culture; a number of organizational development initiatives like development of competences and leadership capabilities will support the transformation.

The transformation journey has been initiated across the organization with a large number of colleagues involved, to ensure the right solutions for our customers and Terma.

Production facilities

At our two main production facilities in Denmark (Lystrup and Grenaa), we have witnessed an impressive transformation in order to meet the demands for quality and on-time delivery and not least to continuously support our customers with cost-saving efforts.

In October 2017, Terma marked yet another milestone as supplier to the F-35 program, the world's largest defense industrial project, with Lockheed Martin Corporation as the main contractor. Since 2015, the entire factory layout has been modified

Terma's ambitions for further growth and globalization set new requirements for our ways of working; processes need to be globally standardized and lean.





and optimized. For example, the internal transport distances have been reduced by 50%. With the support of the Northern Djursland Municipality and a number of local businesses, the project has been completed on time and within budget, and during the same period, we have recruited approx. 80 new employees, primarily from the local area.

An example of an internal optimization process is "Warehouse Optimization" with the purpose to streamline and digitalize picking operations and other storage activities by up to 50% in the two factories. Electronics Manufacturing in Lystrup and Aerostructures Manufacturing in Grenaa have collaborated on the project. The project will lead to improved alignment of logistics processes in the two factories.

Global expansion

During the past 10-15 years, Terma has expanded the international presence by opening offices and facilities in eight countries, and well above 200 employees are currently situated outside the Danish borders.

In 2017/18, Terma celebrated 10 years of presence in Asia Pacific with offices in Singapore and New Delhi. The region plays an important role in Terma's global business as we have provided a large number of radars and surveillance systems in the region to secure coastlines, harbors, airports, and naval vessels along with command and control systems and self-protection systems for naval and airborne platforms.

Terma and UAE-based AI Maskari Holding agreed to establish a Joint Venture, named Terma Middle East Trading LLC, in Abu Dhabi, UAE. The partnership will operate from the Terma Middle East Trading LLC's new office in Abu Dhabi and serve as the local interface to Terma's partners, customers, and clients in the UAE.



In times of expansion and growth, Terma is in continuous search for highly skilled manpower both nationally and internationally. After years of successful U.S. business operating under a Special Security Agreement with the Defense Security Service and a U.S.-based Board of Directors, Terma is expanding our North American operations to include a new office with focus on technology development to meet our customer's emerging needs and not least to capitalize on Atlanta's position as one of the premier technology innovation locations in the U.S.



Visualizing our products and systems

At several international events during 2017/18, Terma started demonstrating products and solutions in a new and lively Virtual Reality setup.

Virtual Reality (VR) has become mainstream. The development in hardware capabilities, head tracking, and software now facilitates fluent and convincing 3D experiences. The technology offers unique ways of displaying the capabilities of Terma's products and solutions, by showcasing them in virtual environments similar to the real-life environments in which the products are used. For example, customers can experience a virtual F-16 flight where Terma's electronic warfare (EW) system is demonstrated in a realistic scenario.

Augmented Reality (AR) is another emerging technology that offers virtual overlay of information on top of real-world products or environments. We are now exploring the use of the AR technology in a production setting at our F-35 composite manufacturing facility.



To stay at the forefront and utilize these new technologies, Terma has launched a technology project in order to increase the use of visualization.



Audio

Our advanced audio technology is used for 3D-Audio warning systems and is demonstrated in a VR setup at exhibitions and trade shows worldwide.

BUSINESS AREAS



AERONAUTICS

Aeronautics is a major supplier to the F-35 program and a global provider for the aerospace and defense industry of advanced electronic warfare (EW) and aircraft self-protection solutions, tactical audio technology, aerostructures, and electronics manufacturing services.



Steve Williams

President & CEO, Terma North America
Aeronautics

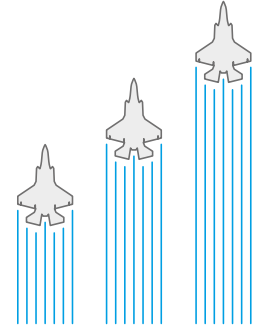
On the F-35 global industry team since 2004, from development to production, Terma continues to provide complex composite structures, pylons, and electronic systems to F-35 prime contractors. Since 2009, more than 300 MDKK has been invested in the Grenaa facility to upgrade manufacturing capabilities and infrastructure to meet the demanding tolerances and sophisticated technologies of the Joint Strike Fighter program.

Our well-recognized Electronic Warfare Management System (EWMS) ALQ-213 is capable of integrating any combination of EW subsystems into a coherent and complete systems solution on any type of aircraft. The ALQ-213 EW integration platform includes high-level functions such as sensor integration, embedded training, and automatic threat response. Over 2,500 aircraft continue to operate with our systems, assuring safe return of pilots and crew and mission success. To allow systems to be used across the fleet and reduce the overall cost, sensor subsystems may be installed using advanced aerostructures, i.e. pylons or modular pods.

Our advanced audio technology is used for 3D-Audio warning systems. Chosen by the Danish, Belgian, and Dutch Air Forces and U.S. Air National Guard for their fighter aircraft, Terma's Active Noise Reduction and Electrical Noise Cancelling System reduces pilot stress and fatigue and uniquely provides for increased situational awareness.

Within our Electronics Manufacturing Services area, we deliver solutions to leading aerospace companies in the U.S. and Europe, including key components for the F-35 and major components for large defense contractors such as Raytheon Company.

**300
MDKK**



Since 2009, more than 300 MDKK has been invested in the Grenaa facility to upgrade manufacturing capabilities and infrastructure for the Joint Strike Fighter program.

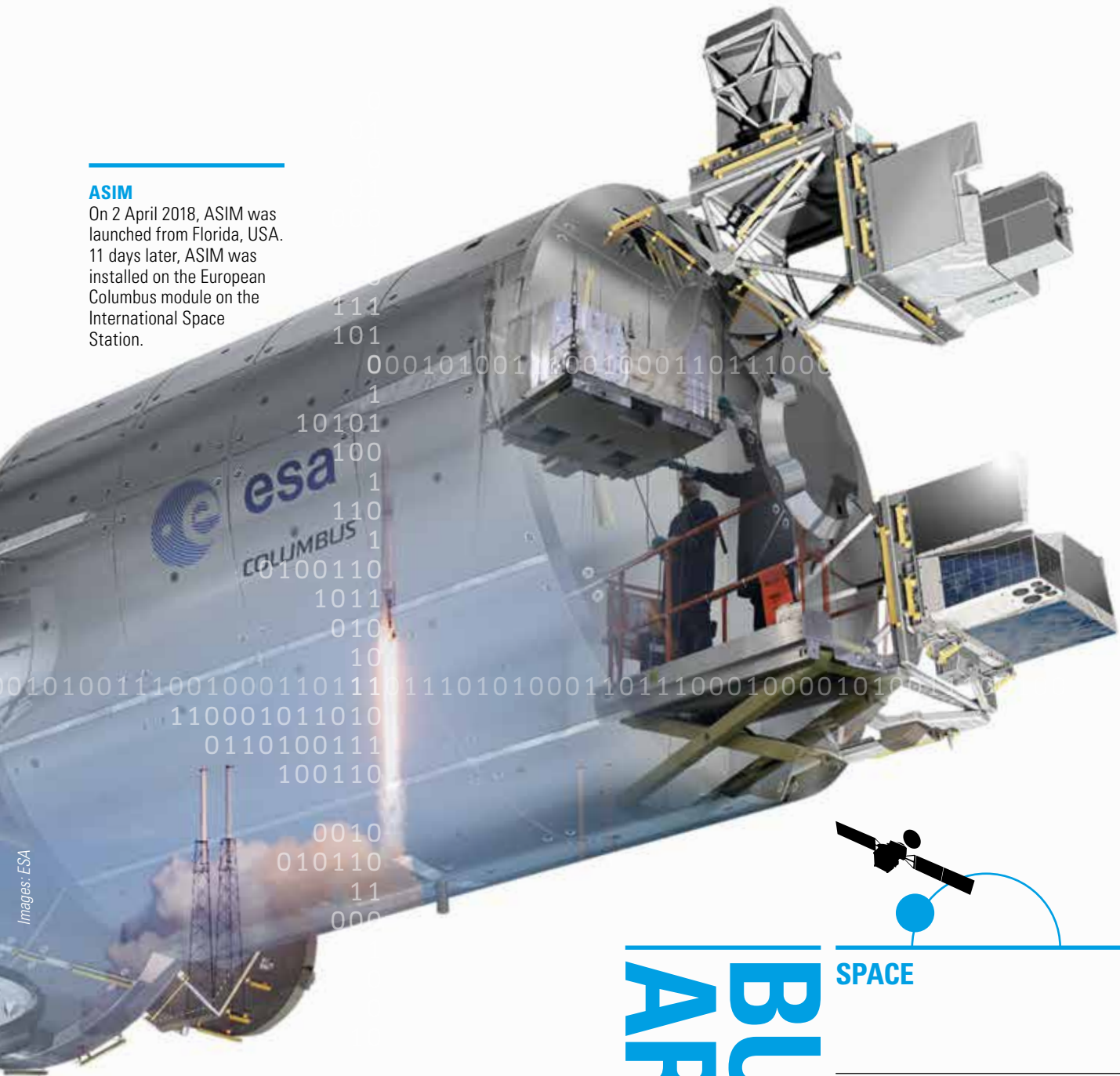


Image: Lockheed Martin Aeronautics

ASIM

On 2 April 2018, ASIM was launched from Florida, USA. 11 days later, ASIM was installed on the European Columbus module on the International Space Station.

Images: ESA



BUSINESS AREAS

SPACE

The knowledge and technology of Danish space research and Danish companies within this market are world-class. In recent years, an increasing scientific, commercial, and educational interest has manifested itself.



Carsten Jørgensen
Senior Vice President, Space

Terma contributes with mission-customized software (for onboard as well as ground applications) and hardware products as well as services to support a number of in-orbit pioneering European scientific, Earth observation, and navigation missions, such as Mars Express, Sentinel(s), Gaia, CryoSat-2, Lisa Path Finder, ExoMars 2016, and Galileo.

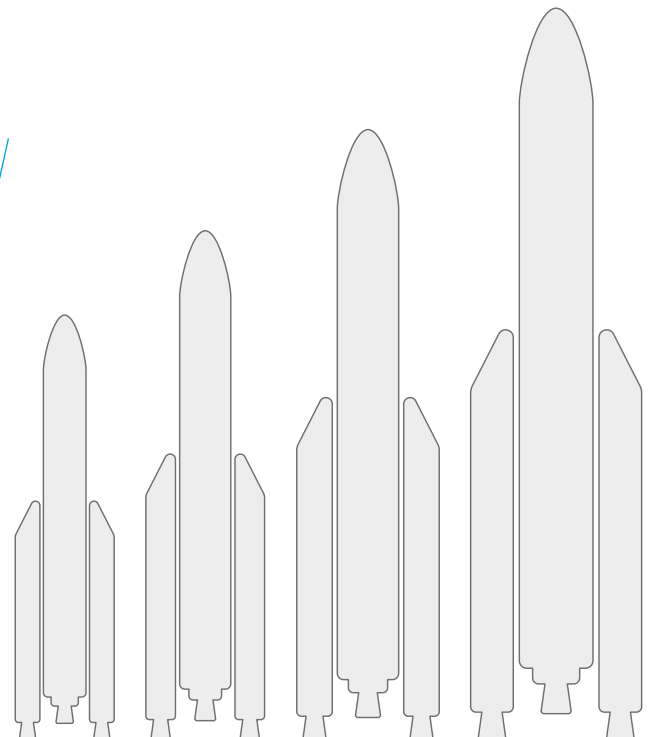
Additionally, Terma is contracted for the development and delivery of software and hardware systems and services for numerous ongoing and future European, Asian, and U.S. satellite missions. Examples of these are: BepiColombo and Solar Orbiter with expected launch in 2018 and 2019, respectively; Euclid

with expected launch in 2020, Juicy with expected launch in 2022, as well as U.S. and Asian missions.

Also, Terma is under contract with OHB System AG for the Sarah and the Electra missions in areas of both power electronics and software.

Furthermore, Terma is under contract with ESA for the highly sophisticated man-space ASIM mission. Terma is responsible for the international scientific and industrial team which developed a structure containing cameras and photo-meters which has been installed on the International Space Station. The purpose of the mission is to contribute to the study and understanding of how thunderstorms affect the atmosphere and the climate. ASIM was launched in April 2018 and is going operational after commissioning early June.

The Engineering Services area of Space has continued to grow as a result of a number of new framework contracts at ESTEC, ESOC, EUMETSAT, and ESO together with on-site support activities at prime premises.



Terma Space has continued to grow due to an increasing scientific, commercial, and educational interest and a number of new framework contracts.

Danish-led observatory installed on the International Space Station

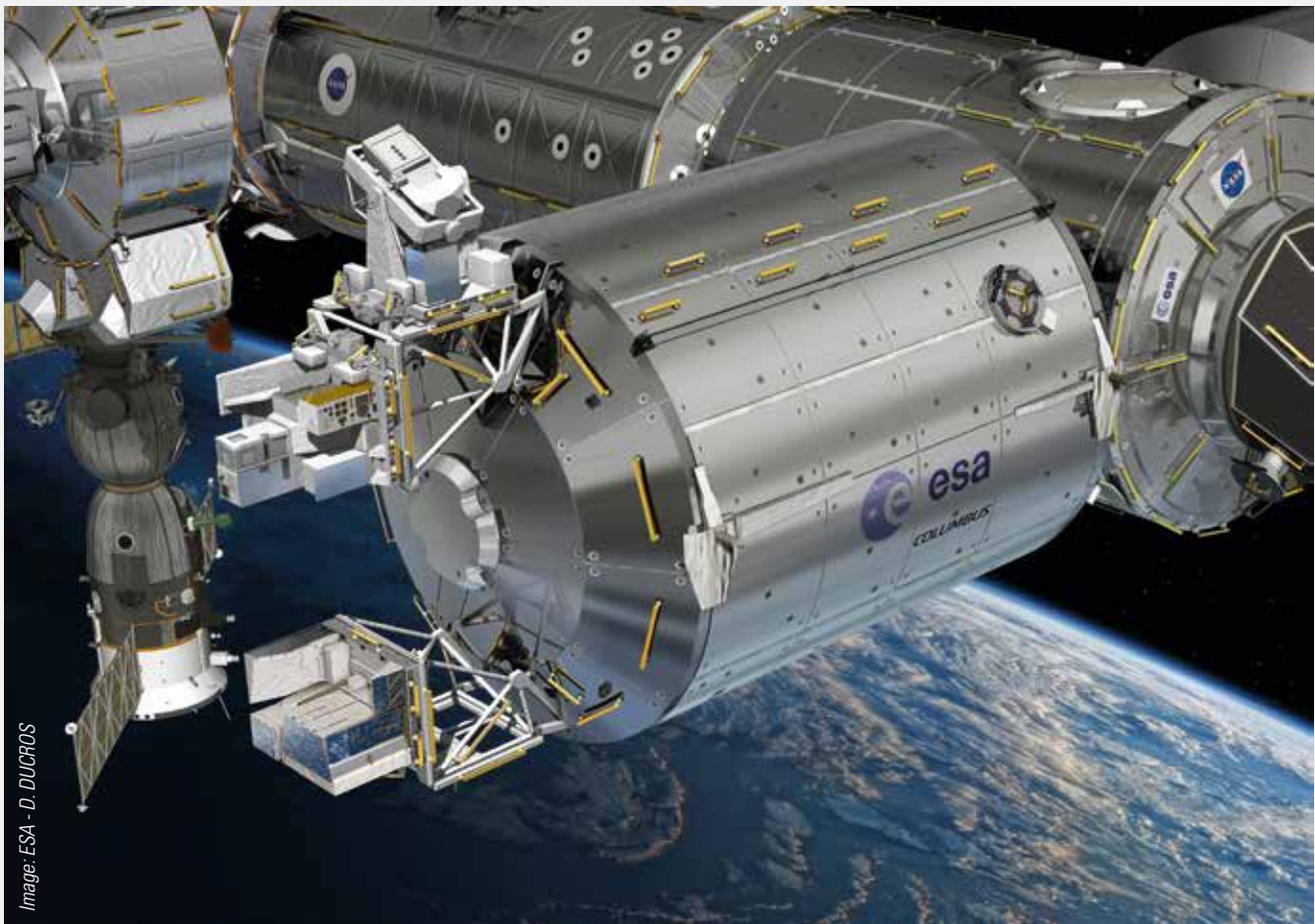


Image: ESA - D. DUCROS

On 2 April 2018, the Atmosphere-Space Interactions Monitor (ASIM) was successfully launched from Cape Canaveral in Florida for a two-day journey bound for the International Space Station (ISS) on a SpaceX Falcon 9 launcher. 11 days later, ASIM was installed on the European Columbus module, and the commissioning process was initiated.

“The ASIM project is the largest Danish space project ever developed. For Terma, it has been a very exciting journey to head an international team of scientists and engineers who in the past 11 years have been involved in the development,” says Carsten Jørgensen, Senior Vice President, Space.

ASIM is developed under the auspices of the European Space Agency, ESA. Terma has the overall management and technical responsibility of



Image: Gunnar Maehlum

ASIM. DTU Space has the scientific leadership, and the Danish Meteorological Institute supplies global meteorological data products and participates in the scientific studies. Additional partners are University of Valencia, Spain; University of Bergen, Norway; Space Research Center, Poland; OHB Italia, Italy; and B.USOC, Belgium.

“ASIM is equipped with technology which will also be used for future missions worldwide and will provide a good return on investments in Denmark. This project has shown that Danish industry together with universities and international partners can deliver unique equipment to be used in space,” says Carsten Jørgensen.

ASIM is to study thunderstorms, meteors, and climate conditions from space. From ISS, the ASIM instruments are looking down to observe what happens in the atmosphere – from the top of the clouds and up to the border between the Earth atmosphere and space at 100 km. Here, giant lightning events like blue jets, red sprites, elves (commonly known as TLEs) as well as atmospheric X- and gamma-ray flashes are formed.



ASIM uses optical observations in carefully selected bands in order to filter data with Transient Luminous Events (TLEs) from the regular lightning data. Since downlink is limited, these algorithms are implemented in the onboard software. The ASIM Modular Multi-Imaging Assembly instrument (MMIA – developed by Terma) is capable of observing 12 frames per second continuously in the 777.4 nm and 337 nm bands, both only 5 nm wide. Combined with 100 kHz photometer data from the same two bands in addition to a 180-230 nm band, data is analyzed and filtered in real time to optimize the available downlink capability allocated to ASIM on ISS.

The ASIM instruments take pictures of lightning and TLEs in the visible spectrum, count photons, and measure X-ray and gamma-ray radiation from thunderstorms.

Both the X-/gamma-ray radiation, invisible to the human eye, and the fascinating giant lightning, striking into Space instead of down towards Earth, will be studied more precisely and systematically than previously possible.

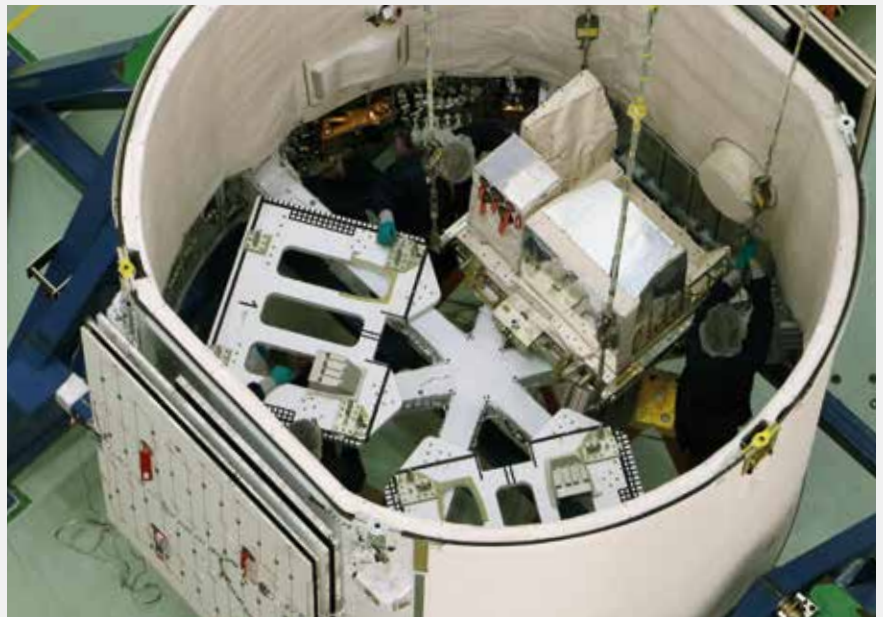
The new knowledge will give us insight into the anatomy of lightning, which will help us understand the electrical and chemical processes interaction in the atmosphere to space boundary.

Moreover, ASIM collects data about water vapor, clouds, and aerosols which form part of a complex interaction in connection with thunderstorms and influences the Earth's climate. Thus, we get a better understanding of how thunderstorms and related phenomena may influence the climate on Earth which again may contribute to improved climate models in future.



The ASIM cameras can also study meteors coming into the Earth atmosphere and will be able to help work out where they will land so that they can be located and studied.

Mid-May 2018, the first unique images and scientific data captured during the commissioning phase were presented by the scientists from DTU Space at the Technical University of Denmark.



On 1 December 2017, ASIM arrived in the U.S. for thorough tests and checking at Kennedy Space Center prior to launch.

A few hours before launch (from left): Ole Hartnack (Terma), Danish Astronaut Andreas Mogensen, Torsten Neubert (DTU Space), Carsten Jørgensen (Terma), and Kristian Pedersen (DTU Space)

SCANTER

The SCANTER radar systems are renowned for their unique capability to detect small and maneuvering targets at long distances and under all weather conditions.



SURVEILLANCE & MISSION SYSTEMS

Surveillance & Mission Systems (SMS) has leading positions globally in selected markets for security and safety applications at sea, in the air, and on land with our SCANTER surveillance radars.

BUSINESS AREAS



Thomas Blom

Senior Vice President, Surveillance & Mission Systems

Through our T-Core command and control technology, we provide solutions in the naval, air, and missile defense markets as well as protection of critical infrastructures in the security market.

The recently launched T.react CIP product provides critical infrastructure protection against intruders and security threats using the SCANTER 1002 advanced ground surveillance radar and advanced detection algorithms coupled with automated camera control. It provides very effective area protection compared to traditional fixed camera installations. This novel approach continues to spark high interest from the market and has secured an order for perimeter safety of one of the most prominent infrastructures in the Middle East.

Navies and coast guards worldwide are important to SMS, with market focus on Offshore Patrol Vessels, Patrol Vessels, Fast Attack Craft, and interceptors with the C-Series – where we combine our key C2 technologies to deliver a new level of integration and automated surveillance. All systems are designed for vital day-to-day missions such as territorial and Economic Exclusive Zone (EEZ) patrolling; counter piracy/terrorism, Search & Rescue operations, and peacekeeping missions.

The T.react CIP product provides critical infrastructure protection against intruders and security threats using the SCANTER 1002 advanced ground surveillance radar and advanced detection algorithms coupled with automated camera control.

The SCANTER radar systems are renowned for their unique capability to detect small and maneuvering targets at long distances and under all weather conditions. Terma is the preferred choice for maritime surveillance, mission critical border security, and traffic safety applications by users worldwide. The modular SCANTER radar product portfolio comprises three transceiver models; the SCANTER 2000 series with a very attractive price/performance mainly for maritime surveillance and the high-end SCANTER 5000 and SCANTER 6000 series for long range land-based coastal surveillance and for naval/coast guard applications on board ships.

The SCANTER 4000 radar series is for medium-range air surveillance and has undergone a significant technological upgrade, moving from tube to High-Power Solid State technology, increasing reliability, performance, and significant savings in cost of ownership. Primarily used for naval applications, the ability of the SCANTER 4000 radars to detect aircraft in the vicinity of wind turbines and over large wind turbine farms has been demonstrated in multiple tests. Terma has a growing number of radars in operation in airports close to larger wind turbine farms to mitigate wind turbine disturbances, and Terma is the only company to have received full government safety approval for this application.

The tall wind turbines in wind farms require powerful aircraft obstruction lights, an unfortunate disturbance to neighbors. However, this can be mitigated with a SCANTER radar turning lights on only when aircraft are in the proximity. With the first installations in operation and with approvals in Germany and USA, Terma is in the forefront in this market.





Lars Hedemann Hilligsø
Senior Vice President, Support & Services

2000+
aircraft

25+
radar systems

With a large, constantly growing, installed base, Terma supports more than 2,500 radar systems, 2,000 aircraft, and several navies worldwide.



BUSINESS AREAS

SUPPORT & SERVICES

The support and services include discrete spare parts sales, on-call services, and off-the-shelf service concepts as well as more complex availability solutions, which can be tailored to fulfill any operational profile required by the customers.

Centers for Maintenance, Repair & Overhaul (MRO) with a wide range of capabilities are situated in selected geographical locations around the world to support our customers. Currently, the MRO capabilities and capacities are expanding in both the Netherlands and in the U.S.

Furthermore, Support & Services has an extensive network of service partners supporting our ability to be agile and meet our customers with short response times.

Sustainability is essential in a market where the demand for component availability increases and where customers' requirements for long product life cycles increase. Based on decades of experience, Terma's Support & Services staff understands the importance of through-life support in order to meet customers' operational requirements.

With a large, constantly growing, installed base, Terma supports more than 2,500 radar systems, 2,000 aircraft, and several navies worldwide.



New communication system to the Danish National Police



At the beginning of 2018, Terma entered into a contract with the Danish Center of Emergency Communication for the delivery of a new Radio Dispatch system including service and maintenance to the Danish National Police.

In 2013, Terma delivered the T.react Radio Dispatch system for 11 of the Danish Police districts and the National Commission of the Danish Police. A Radio Dispatch system controls communication between the police control rooms and units in the field. During the development of the system, Terma targeted user-friendliness, easy application, and facilitation of the daily police tasks. Since delivery and commissioning, the original system has performed at a constant high and stable level.

However, five-six years is a long period when it comes to innovation and technical development, and during 2017, Terma responded to a tender from the Center of Emergency Communication (CFB) and presented a proposal for delivery, service, and maintenance of a new Radio Dispatch system for the Danish National Police. The positive outcome of this process was a contract award to Terma.

The new Radio Dispatch system replaces the 2013 version and will provide 24-hour service to approximately 100 simultaneous users at 15 of the National Police' control and operations centers.

In addition to the delivery, the contract includes service and maintenance, and it ensures a continuous possibility of system development through option packages that can be purchased during the contract period.

"The contract is of great importance to Terma, and we are pleased to continue the collaboration with the Danish National Police in the coming years. Together with the Danish Defence, Copenhagen Airport, the Danish



Regions, and the Danish Emergency Management Agency, the Danish National Police is a significant and valued Danish customer of Terma. Through our collaboration with these customers, we support the Danish authorities' efforts to secure safety and security in Denmark," says Lars Hedemann Hilligsøe, Senior Vice President, Support & Services.

CFB's task is to ensure that the state investment in emergency communication is managed and further developed to the best possible extent. CFB is responsible for developing efficient, well-functioning, and technologically updated communication systems for the Danish Emergency Management Agency.

Terma has delivered Radio Dispatch solutions to several of the Danish Regions and rescue teams as well as to the overall national emergency management in Finland.

A Radio Dispatch manages the communication between control centers and operational units like handheld terminals, car terminals, and mobile command centers. With Terma's Radio Dispatch, the staff at the emergency centers obtains an efficient overview and will be able to manage and coordinate emergency responses in crisis situations and in everyday life.

The Radio Dispatch can be scaled from one control room to any number of control rooms distributed in a given geographical area and can be configured to handle the necessary subset of voice groups and terminals in the nationwide Tetra network SINE.



Image: Royal Danish Air Force

International

Terma continues its international expansion with the purpose of being closer to key customers and end users.



MARKET DEVELOPMENT

Market Development delivers on the Group's global and regional strategies and maintains and strengthens strategic customer and partner relationships.

INTERNATIONAL



Jørn Henrik Levy Rasmussen

Senior Vice President, Market Development

Terma's international activities are headquartered in Denmark and Washington D.C. with regional and local offices in Singapore, India, United Arab Emirates, the Netherlands, Belgium, France, the UK, and Germany. Market Development works closely with each Business Area and Terma North America to deliver the entire Terma portfolio of products.

Terma continues its international expansion with the purpose of being closer to key customers and end users. In 2015, Terma opened an office in Brussels, Belgium, to work more closely with key partners and policy-makers within NATO, the EU institutions, industry organizations, and international partners.

In the coming years, the Danish market will remain a key foundation for Terma's continued international success.

Europe

Security concerns remain high throughout Europe, and Terma is working with customers and end users to ensure that we meet core operational and technical requirements as defense budgets rise.

In the space domain, Terma continues to be a key supplier to ESA missions and eyeing more important opportunities in military space applications.

In the area of safety, Terma is seeing an important European – and global – business in new niches such as windfarm radar mitigation and windfarm Obstruction Light Control, as well as well-established niches like surface movement control in airports, Vessel Traffic Service, and coastal surveillance.

In Europe as a region, Terma is well established with companies in Denmark, Germany, the Netherlands, the UK, and an office in Brussels close to key European and transatlantic decision makers.

Terma's European regional team is responsible for promoting Terma's success in the region.



Kristoffer Groth Jakobsen

Vice President, Europe

Denmark

In 2018, Denmark adopted a new six-year defense agreement, which – when fully implemented – will entail a 20% spending increase. As a Danish market leader, Terma is in close dialog with Danish society at all levels to provide optimum value to Denmark. It is crucial for Terma's business that we can continue to deliver best-in-class solutions for Denmark on a competitive basis.

The F-35 program and Denmark's role in the program continue to bring exciting opportunities for Terma and is a strong testament to Terma's important role in the World's largest aerospace and defense program.

As an integrated element, Terma's Industrial Cooperation and Partnerships function works across Business Areas and hand in hand with Terma's regions. The unit is tasked with both nationally sanctioned Industrial Cooperation for technology critical to Danish security interests and ensuring that Terma delivers on global offset commitments globally.

Terma and Scandinavian Avionics teamed up to form Avionics Test Center Denmark, targeting the F-35 Joint Strike Fighter



EU and NATO

The office in Brussels, Belgium, is a key element in tracking new European Union initiatives and liaising with NATO stakeholders.

As Europe spends more on defense and security in the coming years, Terma is proud to offer our insight as a European mid cap-sized, high-tech defense and security company with significant business throughout Europe, across the Atlantic Ocean, and globally.

Terma is specifically proud to play a role in the first-ever EU call for Preparatory Action for Defence Research (PADR), OCEAN2020.

Germany

Terma GmbH, the German subsidiary, is a cornerstone in the execution of Terma's European ambitions and a member of BDSV.

Based on our strong position with ESA in Darmstadt for more than 25 years, the German subsidiary is increasingly positioning itself for additional defense and aerospace opportunities with German end users and customers.

Among other German partners, Terma's solutions are already fielded with the German Air Force, and Terma's renowned SCANTER radars are in use across Germany for a wide variety of applications.

For the spacecraft prime contractors, Terma GmbH supplies software for validation of mission critical spacecraft flight software.

The Netherlands

Terma B.V., the Dutch subsidiary, focuses primarily on space activities, aircraft survivability equipment, aspects of the F-35 program, and maritime business.

Terma B.V. forms a core part of Terma's business in Europe. The Dutch head office is located in Leiden, and Terma supports the Royal Netherlands Air Force from our facility at Woensdrecht Air Base.

Space activities in the Netherlands include in-house turnkey system integration and development, specializing in spacecraft test, simulation, and in-orbit management systems together with the provisioning of highly specialized engineering consultants to ESA's European Space Research and Technology Centre in Noordwijk, the Netherlands.

Terma B.V. is a member of NIDV.

United Kingdom

Terma is increasingly looking for British partnerships where Terma can add value to British and global customers and end users.

Terma (UK) Ltd. primarily focuses on space activities with the purpose of supplying engineering services to the UK space industry and ECSAT, the European Centre for Space Applications and Telecommunications.



Nils Greir

Vice President, North & Central America

North and Central America

Due to the size and reach of the U.S. defense market, North and Central America is a key region for Terma. More than 40% of Terma's revenue comes through the U.S., and in 2017/18, Terma North America Inc. continued to expand to be closer to our customers and end users in North and Central America. With the opening of the new Terma Innovation Center in Atlanta, GA, we have added an additional node to our global technology and innovation network where we strive to develop the best possible solutions for our customers and end users. Engaging with local U.S. stakeholders is essential, and in collaboration with our industry partners and research institutions, we will reach new goals in the years to come by establishing a Center of Excellence within self-protection systems. For 15 years, Terma North America has been a local U.S. partner supporting growth in North and Central America, and our facility in Atlanta, GA, is Terma's fifth U.S. location.

2017/18 was also a remarkable year for Terma North America's Surveillance & Mission System's business. With the sale of the first Terma radar – a SCANTER 6000 – to the U.S. Navy, we have proven that we can support the World's biggest navy in their maritime operations. In addition, the U.S. Coast Guard signed a five-year sole-source, indefinite-delivery/indefinite-quantity (IDIQ) contract with Terma North America for support and service of their 40 Terma Vessel Traffic Systems located in major ports and waterways across the U.S. In 2017/18, Terma North America also reached new milestones in our pursuits to deliver ship self-protection and radars for Canadian Navy and Coast Guard programs. We look forward to building on these partnerships in the years to come.

2017/18 also brought crucial advancements for Terma North America's Aeronautics business with a strategically important contract to supply the Terma 3D-Audio solution to hundreds of U.S. Air National Guard (ANG) F-16s. With 3D-Audio, the ANG pilots will experience a significant increase in situational awareness and speech intelligibility enhancement through a more natural and intuitive auditory interface. Terma's involvement in the F-35 Joint Strike Fighter program continued to evolve in 2017/18 with the signing of additional contracts with Lockheed Martin Corporation and a Program of Life MoU with Northrop Grumman Corporation.



Terma is developing a target recognition and identification system for NATO



In 2016, Terma was contracted to supply an automated target recognition and identification system for NATO Alliance Ground Surveillance Management Agency (NAGSMA).

The system will assist the operators in control rooms in interpreting Synthetic Aperture Radar (SAR) data from the remote controlled Global Hawk aircraft. In this context, we make use of Artificial Intelligence in the Intelligence, Surveillance & Reconnaissance (ISR) domain.

“We see this as a very important system and a technology program that enables Terma to bring several of our core competences within radar technology and signal processing in play to benefit the operational value of the NATO AGS system,” says Claus German Christensen, Vice President, Mission Solutions.

Alliance Ground Surveillance

The NATO AGS capability is being acquired by 15 NATO countries and will be made available to the Alliance. All NATO nations contribute to the development of the AGS system through financial contributions covering the establishment of the AGS Main Operating Base as well as to communications and life cycle support of the AGS capability. The NATO-owned and -operated AGS Core capability will enable the Alliance to perform persistent surveillance over wide areas from high-altitude, long-endurance aircraft, operating at considerable stand-off distances and in any weather or light condition.

Data from Global Hawk

In 2019, Terma will deliver a system which will assist the operators in the control rooms in interpreting radar data from the remote controlled Global Hawk aircraft. The Global Hawk Synthetic Aperture Radar (SAR) is generating

a very significant amount of surveillance data, and the automatic processing functionality developed by Terma increases the situational awareness during live operations. The SAR technique generates images that resemble aerial photographs seen with radar glasses.

Automatic identification and classification

Specifically, Terma is developing a system that can automatically identify and classify the objects that move around on the ground, thereby helping operators obtain an improved overview of the areas they monitor. In order to create such a system, we involve technologies (machine learning, pattern recognition), which are still under development within the international research community, but with a promising potential, also within our own radar and ISR (Intelligence, Surveillance & Reconnaissance) product area. Thus, in addition to internal knowledge and experience from Terma’s signal processing specialists, we also obtain assistance from partners to ensure that the users will receive a system that will help them in their everyday working lives, but which it is also possible to upgrade continuously as new technology is developed.

To establish a SAR image database for development purposes and exploiting state-of-the-art knowledge in relation to image recognition and machine learning, Terma has worked closely with the Technical University of Denmark.

The system will be integrated at NATO’s AGS Main Operation Base at Italian Air Base Sigonella in Sicily.

North and Central America, continued

These are only the first steps in our journey to further develop Terma North America's impact with a goal of reaching an order intake of 1.2 billion DKK in five years. In the U.S. market, our main growth drivers in the coming years will be the impending penetration of the wind systems radar market, a deeper involvement with the U.S. and Canadian Navies and Coast Guards, along with new developments within airborne self-protection systems and Smart Expendables.

Asia Pacific

Terma Asia Pacific covers the Asia Pacific region, currently with two regional offices: one in Singapore (regional HQ), Terma Singapore Pte. Ltd., and one in India, Terma (India) Pvt. Ltd.

The consolidated Asia Pacific region is a bustling market with a multitude of defense, security, and infrastructure opportunities ranging from upgrade and modernization programs to new build initiatives, all being a testament to the economic growth the region is witnessing as well as the geopolitical tensions being a reality.

Terma Singapore provides the Asia Pacific market presence for the Aeronautics, Surveillance & Mission Systems, and Support & Services Business Areas through sales, business development, project management, after-sales, and technical support. Terma India serves as a marketing, branding, and business development office for most of the Indian subcontinent.

Strengthening and increasing its network of regional partners whilst strategic partnerships are being even further nurtured and developed to encompass more forms an integral part of Terma's strategy in Asia Pacific. Today, Terma is established as a respected and reliable regional partner and supplier of high performance and reliable defense and security solutions in the expanding and developing Asia Pacific markets.

The overarching trend in the Asia Pacific region is a growing ambition and demand to be self-reliant. Willingness to abide to Transfer of Technology and local production requirements is to a great extent the key to unlock the



Anupam Narain Mathur

Vice President & General Manager, Asia Pacific

marketplace, an ethos Terma has incorporated as the very basis of its product development and used successfully in the region.

The SCANTER radar family continues to be driving a significant interest and pull for applications ranging from surveillance of critical infrastructure and airport Surface Movement Radars over large vessel traffic management systems to coastal and naval surveillance applications. Terma's flexible naval C2 product portfolio has lately been attesting a significant upwards going interest trajectory from various navies in the region where we, amongst others, have also managed to penetrate an undisclosed navy with our complete naval C2 product offerings. With many countries in the process to acquire and/or modernize their fleet of aircraft, there is also a large market potential for Terma's niche solutions in the domain of aircraft survivability solutions and 3D-Audio solutions.

Middle East and North Africa

Following the establishment of a local company in the UAE and onboarding of new sales people, Terma Middle East Trading LLC leased a new office space in International Tower in Abu Dhabi. The building and the neighboring area is home to numerous local and international defense and security companies as well as ideally located right next to our joint venture partner, Al Maskari Holding.

The traditional market for Terma in the region has been in the area of security and surveillance, which is exemplified by our steady sale of radars for Vessel Traffic Service and coastal surveillance applications over the last decade.

In the past year, we have experienced continuous sales of our coastal surveillance, Vessel Traffic Service, ground surveillance, and Surface Movement applications as well as sales of the T.react CIP solution for the protection of critical infrastructures. We expect this trend to continue in the coming year alongside further sales of products from our aeronautics and naval portfolios.



David Adgill Larsen

Vice President & General Manager, Middle East & North Africa



Global breakthrough for Terma's 3D-Audio/Active Noise Reduction system



Late 2017 and early 2018, the U.S. Air National Guard/Air Force Reserve (ANG/AFRC), the Belgian Defence, and the Royal Netherlands Air Force independently awarded contracts for the Terma Aircraft Audio Management System which also includes the market-leading 3D-Audio and noise reduction capabilities for their fleets of F-16s.

The U.S. Air National Guard/Air Force Reserve Command (ANG/AFRC) signed a major ~250 MDKK multi-year agreement to upgrade hundreds of F-16s, which provides paths for us to include other aircraft types in the future. Work will be performed at Terma's facilities in Denmark and is expected to be completed by January 2024.

The Dutch and Belgian Air Forces selected the Terma Aircraft Audio Management System (AAMS) and thereby joined the Danish Air Force which has been flying with our AAMS since 2009.



Image: USANG-AFRC

These three contracts secured within a short period of time mark a true global breakthrough for Terma's advanced audio-based communication and situational awareness solution.

The Terma AAMS was initially fielded in 2009 on Royal Danish Air Force F-16s and has been combat proven. The system provides enhancement of the pilot's situational awareness, survivability, and reduction of workload by presenting audio warnings/cues and radio messages in a full 360-degree spherical representation. This capability enables the pilot to get the dynamically updated warning tone/cue in the true direction of the threat and spatially separating radio communication for increased speech intelligibility. The system also provides Active Noise Reduction (ANR) and Electrical Noise Reduction (ENR) for reduced pilot stress and fatigue.

"We foresee an interesting future development for our AAMS, as we are receiving positive indications for future programs from various potential customers. We look forward to establishing a robust application area with a global product and services installed base," says Michael Houmann Tandrup, Senior Business Development Director, Aeronautics.

3D-Audio and Radio Separation

The 3D-Audio technology is proven to provide a significant situational awareness and speech intelligibility enhancement through a more natural and intuitive auditory interface.

3D-Audio perception is a "baseline capability" of any human being (with a hearing ability). A 3D-Audio system basically recreates the "natural sound" (which by definition is 3D) in a standard stereo headset, so putting on the headset will in a matter of seconds enable the listener to perceive and understand it. The capability is utilized in two different ways with the Terma system. Radio separation simply positions each radio at a distinct direction, while 3D-Audio cueing in addition delivers directional information in the most direct and intuitive way.

In addition to the "Radio Separation", an important advantage is the ability to present directions to the user by means of 3D-Audio. Since this is natural audio, one knows the feeling of hearing e.g. a door slam behind you and instinctively and immediately knowing the position.

With 3D-Audio, each audio source is perceived as coming from a distinct direction (as in "real life"), and it is easier to separate them, choose which one to listen to/focus on, and simultaneously the direction could be used to indicate other properties of the audio.

In order to reduce the pilot work load and situational awareness, Terma is the first company in the world to have a 3D-Audio technology available and fielded to support these key enhancements.

Active Noise Reduction

The profile under which aviators and aircrews operate has to some degree changed from short missions of a few hours to missions of 8 to 10 hours, depending on mission and aircraft type. Under long duration operations, the need for low frequency hearing protection becomes important to lower the level of stress and fatigue.

Intelligibility is dependent on the ratio between noise and signal. When the noise component is dominant, the signal needs to increase, and thereby, the overall audio level is increased to something that becomes unpleasant or even potentially damaging to the hearing. Lowering the noise through Active Noise Reduction technology improves the signal to noise ratio and the intelligibility and potentially allows the signal level to be decreased, so an overall audio level within the approved limits is obtained.

