

# Bittium in 2016

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Annual Report 2016



**Bittium**



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# Bittium in 2016

## Financial Performance

Bittium's net sales during in 2016 increased by 13.0 percent year-on-year to EUR 64.2 million (EUR 56.8 million in 2015).

The share of the product-based net sales was EUR 11.9 million (EUR 13.1 million in 2015), which resulted mainly from the product deliveries of the tactical communication system, product deliveries of Bittium Tough Mobile LTE smartphones and related security software, the deliveries of other terminal products for authorities' use, and deliveries of products for measuring and monitoring biosignals. The decrease in the product-based net sales year-on-year was mainly caused by the ending of product deliveries of a special terminal project for a US-based customer during the corresponding period.

The share of the services-based net sales was EUR 51.8 million (EUR 43.4 million in 2015). Despite the decrease in the demand for the services business in the network equipment market, the services-based net sales increased year-on-year due to the increased demand for the R&D services related to the special terminal products.

Operating result was EUR 2.5 million (EUR 2.3 million in 2015).

Cash flow from operating activities was EUR -1.7 million (EUR 2.1 million in 2015, including both continuing and discontinuing operations). Net cash flow was EUR -27.9 million, including the dividend payment in April, the investments made into the company's new office building in Oulu, Finland, and the acquisition made in No-

vember (EUR 79.5 million in 2015 including the cash flow resulted from the sale of the Automotive business and the cash flow of the cancelled demerger process and the cash flows of the voluntary public tender offer of own shares). Equity ratio was 87.0 percent (90.5 percent on December 31, 2015) and net gearing was -70.3 percent (-88.2 percent on December 31, 2015).

## Significant Events

### Changes in the Company's Management and Organizational Structure

On April 27, 2016 Bittium announced following appointments in the company's management group:

M.Sc. Sami Kotkajuuri (b. 1967) was appointed as Vice President, Business Development as of May 1, 2016. Kotkajuuri has been working at Bittium since 2009. As his latest task, he was responsible for the IoT (Internet of Things) Solutions product and service area, where Bittium offers R&D services and customized solutions for companies needing wireless connectivity for their devices. Kotkajuuri continued as a member of the company's management group reporting to Hannu Huttunen, CEO.

M.Sc. Klaus Mäntysaari (b. 1966) was appointed as Vice President, Connectivity Solutions as of May 1, 2016. Mäntysaari has been working at Bittium since 2004. Previously he was responsible for Telecom product and service area, where Bittium offers R&D services for wireless telecommu-

nication market. Mäntysaari continued as a member of the company's management group reporting to Hannu Huttunen, CEO.

The Board of Directors of Bittium Corporation decided on changes in the company's organizational structure and management group to support the company's updated strategy that was announced on November 24, 2016. According to its strategy Bittium's business focuses on three product and service areas: Defense & Security, Connectivity Solutions and Medical Technologies.

Mr. Jari Sankala (M.Sc. Electrical Engineering, Digital Communications) was appointed as Senior Vice President, Defense & Security product and service area. Mr. Sankala has been working at Bittium since 2011 and transfers to his new position from the head of sales. In Bittium's new organizational structure, the sales operations are managed by the product and service areas. Mr. Klaus Mäntysaari (M.Sc.) continued as Vice President, Connectivity Solutions product and service area. He has been working at Bittium since 2004. Mr. Arto Pietilä M.Sc. (Applied Electronics) was appointed as Senior Vice President, Medical Technologies product and service area. Mr. Pietilä has been working at Bittium since 2001, among others as head of operations, head of Contract R&D business and as head of Wireless Solutions business. Prior to Bittium, Mr. Pietilä acted as the Managing Director of Polar Electro Oy.

Mr. Sami Kotkajuuri, head of business development, decided to move on to new challenges outside of Bittium and resigned from the company's service. Mr. Kotkajuuri continued his duties until the end of the year 2016.

As of December 1, 2016 Bittium management group consists of following persons: Mr. Hannu Huttunen, CEO (chairman); Mr. Pekka Kunnari, CFO; Mr. Kari Jokela, CLO; Ms. Karoliina Fyrstén, Director, Corporate Communications and Marketing, heads of product and service areas: Mr. Jari Sankala, Mr. Klaus Mäntysaari, and Mr. Arto Pietilä; and Mr. Jari-Pekka Innanen, Vice President, Engineering.

## Directed Share Issue without Consideration 2016

The Board of Directors of Bittium Corporation decided on March 22, 2016 on a directed share issue without consideration as reward payments to the key persons of the company. In the share issue a maximum of 58,000 new shares was issued without consideration to the key persons entitled to share rewards according to the terms and conditions relating to the share rewards. A total of 9 people belonging to the management and personnel of the company were in the target group of the payment. Of the maximum of 58,000 shares offered in the share issue, 37,500 shares were subscribed. The 37,500 shares issued in the share issue were registered with the Trade Register and registered on the book-entry accounts of the recipients of the shares on March 24, 2016 and became subject to trading on the trading list of Nasdaq Helsinki on March 29, 2016. After the registration of the new shares, the number of shares in Bittium Corporation totaled to 35,693,166.

## Stock Options

A total of 55,498 new shares in Bittium Corporation were subscribed for between December 1, 2015 and March 31, 2016 by virtue of the option rights 2008C. The share subscription price, EUR 30,523.90 was recorded in the company's invested non-restricted equity fund. The corresponding increases in the number of the company's shares were entered into the Finnish Trade Register on February 10, 2016 and April 14, 2016. Shareholder rights by virtue of the new shares commenced as of the above-mentioned registration entry date. Trading

with the newly registered shares started on February 11, 2016 and April 15, 2016 as an additional lot of Bittium Corporation's shares in Nasdaq Helsinki Ltd. The share subscription period for stock options 2008C ended on March 31, 2016.

## Reduction of Significant Customer Relationship

On October 5, 2016 Bittium announced to have received information according to which significant customer cooperation with a global network equipment manufacturer will reduce during 2017. According to the information received, if the planned actions of the customer will materialize in full, these actions might have a negative effect to Bittium's net sales and operating result in 2017. The reduction of the cooperation had no effect on the Bittium's outlook for the year 2016.

## Acquisition

In November 2016, Bittium acquired the ownership in Mega Electronics Ltd and MegaKoto Ltd specialized in healthcare technology. Mega Electronics Ltd was acquired by purchasing 100 percent of the shares in Remega Ltd. Mega Electronics Ltd was a fully owned subsidiary of Remega Ltd. Mega Electronics Ltd owned 28.2 percent of the shares in MegaKoto Ltd, a company specialized in healthcare services, and had signed binding share purchase agreements to acquire 100 percent of the shares in MegaKoto Ltd. The acquisition of the shares in MegaKoto Ltd was completed as planned.

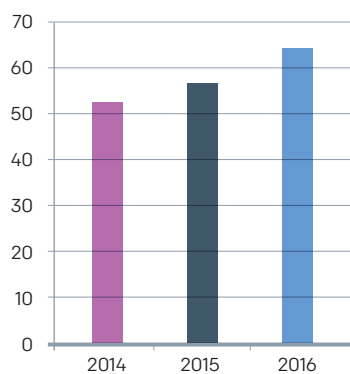
Mega Electronics Ltd (now Bittium Biosignals Ltd), founded in 1983, is a Finnish ISO13485 certified medical device manufacturing company. The company is specialized in biosignal measuring for cardiology, neurology, rehabilitation, occupational health and sports medicine. MegaKoto Ltd (now Bittium Medanalytics Ltd) provides comprehensive arrhythmia monitoring services for its customers such as primary care centers, private clinics and hospitals.

The pro forma net sales of Remega group and MegaKoto Ltd was approximately EUR 3.1 million in 2015 and pro forma operating profit was approximately EUR 0.2 million. According to the preliminary and unaudited accounts, the pro forma net sales of the acquired companies in January-October 2016 was EUR 3.0 million and pro forma operating profit EUR 0.4 million. The net sales in January-October 2016 grew by 58 percent compared to corresponding period in 2015. The companies employ altogether 28 persons and are located in Kuopio, Finland.

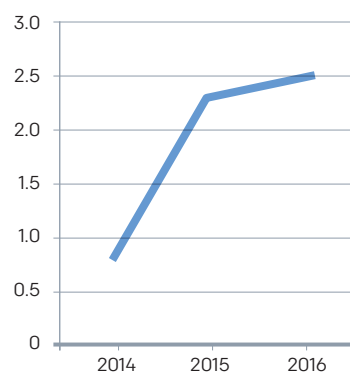
The debt free cash purchase price of the share acquisition, including the purchase price of MegaKoto shares, was EUR 8.0 million, which was adjusted based on the level of cash, debt and networking capital of the acquired companies as of completion of the acquisition. In addition to the aforementioned purchase price, an additional purchase price, capped at EUR 1.0 million, is payable upon the achievement of certain financial performance targets for the acquired business between January 1, 2017 and December 31, 2018. The potential additional purchase price will be paid in cash after achieving the goals. The acquisition had no significant impact on Bittium's balance sheet, operating result and financial position, and it didn't have an effect on Bittium's financial outlook for the year 2016 published on November 3, 2016 in the Interim Report January-September 2016. Remega group and MegaKoto Ltd has been reported as part of Bittium Corporation from the time of acquisition onwards.

With this acquisition Bittium got the ownership of Faros product family, focused on remote heart monitoring, NeurOne product focusing on measuring the electrical activity of brain, and BrainStatus, a disposable quick analysis headband used in emergency and intensive primary care to diagnose for example epileptic seizures and brain stroke, and other healthcare technology products. Faros devices are EU medical device directive class CE class IIa and USA FDA 510(k) registered medical devices. MegaKoto Ltd is a private provider of health-

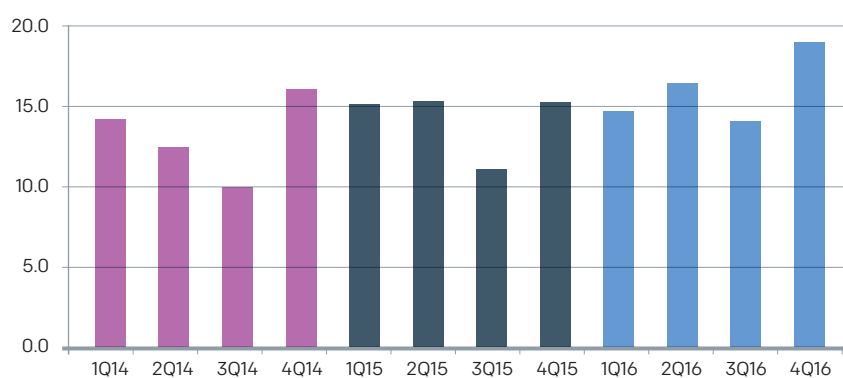
Net sales 2014–2016 (MEUR)



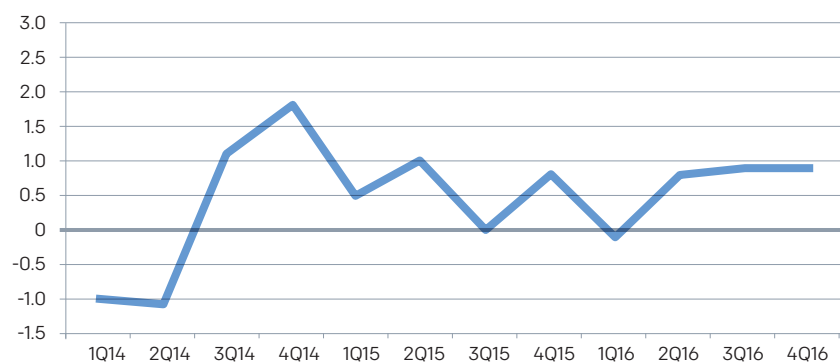
Operating result 2014–2016 (MEUR)



Net sales quarterly 2014–2016 (MEUR)



Operating result quarterly 2014–2016 (MEUR)



care services approved by the Finnish National Supervisory Authority for Welfare and Health having more than 70 health centers and private clinics using its heart monitoring Kardiolog.fi service.

Bittium has over 30 years of experience in mobile radio technology and the acquisition today expands its technology competence to healthcare technology, where mobile solutions are being increasingly used in patient monitoring. The products and services of Mega Electronics and MegaKoto and their strong experience in biosignal measurement technology strengthens Bittium's offering for these markets. Bittium is now able to provide for the healthcare market global leading advanced solutions for patient care both in the hospitals as well as in home care.

## Purpose

We adapt our deep knowledge to deliver superior innovations and reliable, secure communications and connectivity solutions.

## Vision

Bittium's vision is to become a global enabler of secure and reliable connectivity for people and things.

## Strategic Guidelines

On November 24, 2016 Bittium Corporation updated its strategy to strengthen its position in the global markets and to speed up its growth. The company plans to make significant investments in the future by increasing significantly the R&D investments in its own products and solutions in the year 2017. In line with the nature of the defense and public safety markets, the investments will pay back in a longer time period and therefore Bittium plans to activate the most of the R&D investments to its balance sheet. The company has a strong balance sheet and financial position.

Bittium decided to establish a new product and service area around healthcare technology. Combining healthcare technolo-

gies with Bittium's long-term experience and knowhow in wireless and security technologies give the company good conditions to serve its customers in healthcare sector by offering them new kinds of products and services. As the first step to build the competencies in healthcare technology on November 10, 2016 Bittium acquired Mega Electronics Ltd, a company specialized in measuring and monitoring biosignals.

Bittium continues to search for inorganic growth opportunities in all its product and service areas and is prepared to invest in acquisitions that strengthen the company's growth strategy.

According to its updated strategy the company's business is divided into three product and service areas effective as of December 1, 2016: Defense & Security, Connectivity Solutions and Medical Technologies.

### Defense & Security

In the Defense & Security product and service area Bittium offers globally leading products and services for its customers in the defense, security and public safety markets. Bittium aims to significantly increase investments in various authority and special terminals as well as in related software development and extend its tactical communication product portfolio for defense industry. Growth in the net sales is sought especially from own products and product platforms that Bittium offers for international defense and public safety markets.

Bittium's competitiveness in these markets is based on trust and reliability, hi-quality of the products and services, as well as on advanced technology and security knowhow developed within the company during the last 30 years. Bittium offers its customers in the defense market new kind of efficiency for their management systems with products that enable faster data transfer, better mobility, and superior compatibility with other communication systems.

In the public safety markets the transition towards LTE-based technology is expected

to accelerate in the next few years. As the security threats are growing increasingly more security demands are set for the communication systems. Bittium increases investments in developing its product offering further for these markets. The company also continues offering public safety markets R&D services to develop special terminals and related systems that use both terrestrial and satellite networks.

In the defense, security and public safety markets, there are signs of unification regarding technologies as well as in security demands. Also many customers, partners and supply chains are mostly the same and the trend towards this is strengthening. Bittium merged two separate product and service areas into one and with that synergy Bittium is able to better serve the customers in defense and security technology.

The defense, security and public safety markets are slowly evolving markets by their nature. They are characterized by long sales cycles driven by the national governments' long preparation periods of projects and purchase programs. The purchases of the selected products are typically executed over several years.

### Connectivity Solutions

The development of wireless technology continues and digitalization creates growing need for wireless connections. Bittium offers R&D services and wireless connectivity solutions for its customers, and the demand is expected to increase within the next few years. The competitiveness of the company in these markets is based on the strong technology and security competence, as well as on trust, reliability and quality. The more critical the system is, the more significant role Bittium's strengths have.

The demand for developing 4G technology-based network equipment is decreasing as the technology and market reach their maturity. However, Bittium is already strongly involved in the development of 5G technology which in a long run gives the company a good position to offer even more advanced



connectivity solutions also for customers in other markets.

### Medical Technologies

In the healthcare sector, remote monitoring and home care markets are growing strongly. Patient monitoring in the hospital environment is also changing into wireless. These trends create demand for the digitalization of services, wireless capability and secure connections. For these markets Bittium decided to establish a new product and service area around healthcare technology. As the first step to build the competencies in healthcare technology, on November 10, 2016 Bittium acquired Mega Electronics Ltd, a company specialized in measuring and monitoring biosignals.

Combining healthcare technologies with Bittium's long-term experience and competence in wireless and security technologies give Bittium good conditions to serve its customers in healthcare sector by offering them new kinds of products and services.

Bittium plans to strengthen its product and service offering for these markets also by searching for acquisition targets that complements the whole.

## Financial Targets

Bittium has announced earlier that it targets 10 percent annual growth in net sales and to reach EBIT level 10 percent of net sales in the year 2017 at the latest. The company believes that in the coming years it is able to grow its net sales even more than the earlier announced target, and therefore sets up a target to exceed the annual 10 percent growth target of the net sales.

However, Bittium believes, that during the year 2017 it is not yet able to reach the targets set for the growth in the net sales and EBIT level. The reason for this is the termination of significant customer cooperation with a global network equipment manufacturer, of which Bittium announced earlier in October, that is expected to materialize

faster and more extensively than the company estimated earlier. According to the information received by Bittium, the net sales from this customer cooperation will end completely in the beginning of the second quarter of the year 2017. To this extend this kind of extensive and rapid decrease in the services business net sales is most likely difficult to be replaced in a short term. In addition, the operating profit level of the year 2017 is also affected by the planned investments to enable the future growth.

Bittium targets further to increase the share of net sales generated from own products and product platforms. According to the targets Bittium announced earlier, in the year 2017 the share of net sales generated from own products and product platforms is clearly higher than in the year 2014, when the product based net sales was 26.7 percent of the net sales.

## Consolidated Financial Statements

CONSOLIDATED STATEMENT OF COMPREHENSIVE INCOME, MEUR	2016 12 months	2015 12 months
Net sales	64.2	56.8
Operating profit / loss	2.5	2.3
Financial income and expenses	0.6	-0.2
Result before tax	3.1	2.1
Result for the period from continuing operations	3.5	2.3
Result for the period from discontinuing operations		539.0
<b>Result for the period</b>	<b>3.5</b>	<b>541.3</b>
<b>Total comprehensive income for the period</b>	<b>3.5</b>	<b>541.5</b>
Result for the period attributable to:		
Equity holders of the parent	3.5	541.3
Total comprehensive income for the period attributable to:		
Equity holders of the parent	3.5	541.5
Earnings per share from continuing operations, EUR	0.098	0.020

# CEO's Review

Bittium's main focus areas in 2016 were internationalization and enabling growth. We succeeded well in reaching the growth target and the net sales grew by 13.0 percent from previous year and was EUR 64.2 million. Especially service business developed positively, thanks to the demand for R&D services related to special terminal products. In the product business we made lots of efforts to enter the international markets, which have created a good base to grow the product business in the coming years. Due to the market nature and slow development pace we were not able to reach our product business growth targets.

The share of the product-based net sales was EUR 11.9 million which is EUR 1.2 million less than in the corresponding period last year. The decline in the product-based net sales was mainly caused by the ending of product deliveries of a special terminal project for a US-based customer during the corresponding period. The share of the services-based net sales was EUR 51.8 million which was EUR 8.4 million more than in the corresponding period last year. The services-based net sales developed positively thanks to the increased demand for R&D services related to special terminal products. The operating profit slightly grew and was EUR 2.5 million.

We continued the R&D investments in our products and product platforms aiming for growth especially in the international defense and public safety, and mobile security markets. The R&D investments were 10.8 percent of net sales and focused mainly on products targeted for mobile security and

public safety markets, such as further development of Bittium Tough Mobile secure LTE smartphone. R&D investments were also continued in the Bittium SafeMove product family.

Bittium Tough Mobile and device management and encryption software Bittium Secure Suite have created lots of interest in the mobile security and public safety markets, and we delivered many systems for several customer trials for several countries during the last year. We also closed many distributorship contracts and got good partners that have taken Bittium Tough Mobile as part of their own product portfolio and solutions for their customers. Despite the increased awareness of the information security threats and existence of secure mobile devices, the development of the mobile security and public safety markets has been slightly slower than estimated.

The development of the tactical communication system Bittium Tactical Wireless IP Network (TAC WIN), used by the Finnish Defence Forces, continued and we made product deliveries related to that system. We also continued our efforts to bring our product portfolio targeted for defense market to the international markets. We received a small order for TAC WIN system to Asia and an order for TAC WIN system and related integration work to be delivered to the Estonian Defence Forces. We extended our tactical communication product portfolio and brought a new software product, Bittium Tough VoIP Service (Voice over Internet Protocol) to the markets. The new software significantly improves the capability to lead

troops and maintain situational awareness in the quickly changing conditions of the battlefield.

Bittium has been part of the development of the European ESSOR wave form (European Secure Software defined Radio) since it started in 2009. In 2016, the communication of land forces of different European countries enabled by ESSOR wave form was demonstrated both during the Eurosatory exhibition in Paris as well as in battlefield conditions in Finland organized by the Finnish Defence Forces. The demonstrations were carried out jointly with Leonardo from Italy and Thales from France. These demonstrations showcased how the land forces of different European countries can communicate seamlessly with each other in joint operations, linking up via a common waveform regardless of the radio platforms they use.

The product development project for the Mexican Ministry of Communication and Transportation, started in May 2015, has continued according to plans. Bittium develops Android-based mobile devices that use both terrestrial and satellite connection for their MEXSAT system.

The demand for Bittium's R&D services developed positively during 2016. In the beginning of October we received information according to which significant customer cooperation with a global network equipment manufacturer will reduce during 2017. According to the current information the cooperation with the aforementioned customer will end completely during the sec-

ond quarter of 2017. This kind of decrease in the service-based net sales that happens this fast and in this extend, is impossible to be replaced with other projects in a short term. Ending of this cooperation affects significantly Bittium's net sales and operating result in 2017.

In November, we expanded our technology competence to medical technology, where the solutions for patient monitoring are using wireless technologies increasingly. We acquired companies specialized in medical technology and services and our product portfolio expanded to measuring and monitoring of biosignals for cardiology, neurology, rehabilitation, occupational health and sports medicine. Together we are able to provide for the healthcare market global leading advanced solutions for patient care both in the hospitals as well as in home care.

In November, we updated our strategy and financial targets. We plan to make significant investments in our future by increasing the R&D investments remarkably for own products and solutions. In line with the nature of the defense and public safety markets, the investments will pay back in a longer time period and therefore most of the R&D investments are being planned to be capitalized to the balance sheet. The company has a strong balance sheet and financial position. We decided to establish a new product and service area around medical technology. Combining medical technologies with our long-term experience and know-how in wireless and security technologies gives us good conditions to serve our cus-

tomers in healthcare sector by offering them new kinds of products and services. The first step to build the competencies around medical technology was the acquisition made in November.

The year 2016 has been an interesting year of growth. We have built our company for enabling long term growth and internationalization. I want to thank our personnel and partners for the remarkable investments and numerous great achievements during 2016. I want to express my thanks to our customers for their loyalty and trust, as well as our shareholders for supporting the company's long term growth.



**Hannu Huttunen**  
CEO





# Business Operations in 2016

## Bittium's Products and Services

Bittium is specialized in the development of reliable and secure connectivity and communication solutions and mobile information security solutions leveraging its 30 years legacy of expertise in advanced radio communication technologies. Bittium also offers its customers also healthcare technology products and services in bio-signal measuring in the areas of cardiology, neurology, rehabilitation, occupational health and sports medicine based on its over 30 years of expertise in measuring technologies.

Bittium's business operations are divided into three product and service areas: Defense & Security, Connectivity Solutions ja Medical Technologies.



## Defense & Security

In the Defense & Security product and service area Bittium offers globally leading products and services for its customers in the defense, security and public safety markets. Bittium's competitiveness in these markets is based on trust and reliability, hi-quality of the products and services, as well as on advanced technology and security knowhow developed within the company during the last 30 years.

**Bittium Tough Mobile™** is a secure and durable Android-based LTE smartphone combining the latest information security and commercial device technologies. Bittium Tough Mobile incorporates a hardware-based security platform, which enables strong device security as well as deep integration of both customers' own and third-party software security solutions. This dedicated hardware is essential for building layered mobile security solutions. In addition, Bittium Tough Mobile's features include for example a programmable Push-to-Talk button (PTT), glove-usable 5" full HD display, IP67 level water and dust protection, and MIL-STD-810G level shock resistance. Bittium Tough Mobile and related management system and VPN encryption solution have received official encryption product classification in Finland from the Finnish Communications Regulatory Authority where material can be transferred between a smartphone and connected back end solutions on top of creating and processing of classified information.

**Bittium Secure Suite™** is a device management and encryption software product that complements Bittium Tough Mobile smartphone with a scalable set of new software services for remote management, remote

attestation and securing the network connections of the device. Bittium Tough Mobile smartphone and Bittium Secure Suite form a unique, complete, reliable system for processing and transferring sensitive and classified material and securing critical communication.

**Bittium Specialized Device Platform™** is a versatile device platform leveraging latest mass market mobile device hardware and software technologies. The platform enables companies to roll-out fully customized mobile devices in various form factors (incl. module, smartphone, tablet and smart watch) faster and with lower development risks. The platform has been productized to public safety, security, industrial and smart watch markets. One of the major products based on this platform is the Bittium Tough Mobile, secure smartphone.

**Bittium SafeMove® Mobile VPN** software enables the utilization of all IP based applications and networks by securing the connections between the work station and corporate services before Windows login. With Bittium SafeMove, for instance home care workers are allowed to have full access to the same systems and applications they would have on a hospital desktop, enabling real-time access to patient records.

**Bittium SafeMove® Analytics** is an advanced monitoring and reporting module that helps organizations to monitor network connectivity and performance to improve productivity and user experience. The Analytics tool continuously gathers connectivity data such as connectivity status, speed, throughput and bytes transferred, network type and Wi-Fi network information. It is also easy to enhance the tool with positioning information if GPS data is available.



**Bittium Tactical Wireless IP Network™ (TAC WIN)** is a Software Defined Radio based wireless broadband network system intended for military and public safety use. With the system MANET (mobile ad hoc network), link, and connection networks can be formed into one logical IP network quickly, no matter what the location is. Bittium TAC WIN is compatible with existing fixed and wireless network infrastructures. The core of the system is a tactical router that enables users to freely form both wired and wireless broadband data transfer IP connections. Tactical router enables also connections to different types of terminals and other communication systems connecting them into one communication network. In addition to the router, the system comprises three types of radio heads, and each radio head covers its own frequency band area and can be used for flexible formation of optimized network topologies for different communication needs. All the products of the system are designed for harsh conditions, and thanks to the system's automated functions the implementation of the system can be done quickly. Due to the software-based functionality of the Bittium TAC WIN system, it can be easily updated with additional performance cost-efficiently during the whole lifespan of the system.

**Bittium Tough VoIP™** product family's products enable tactical IP calls and broadband data transfer even in demanding conditions. Products are easily integrated to existing IP infrastructure. The product family consists of a range of tactical IP-based communication products, including distributed VoIP service network for tactical environment, Bittium Tough VoIP Service; Voice over IP clients, Bittium Tough VoIP Field Phone and Bittium Tough VoIP Terminal; and network extension unit, Bittium Tough VoIP Network Extender.

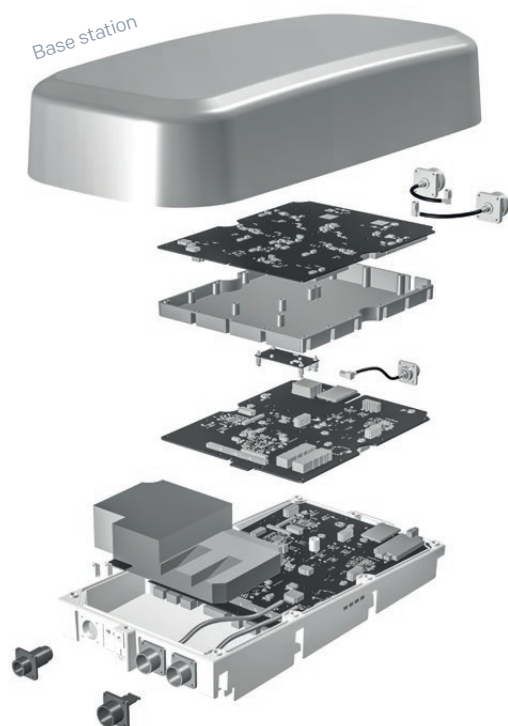
**Bittium Tough VoIP Field Phone™** is a SIP (Session Initiation Protocol) compliant client that provides interoperability with other SIP clients and server implementations available in the market, and incorporates functionality that enables introduction of VoIP services in dynamic self-forming networks independent from server.

**Bittium Tough VoIP Terminal™** is a wireline VoIP phone that can be operated either as a part of Bittium Tough VoIP solution or as a IP terminal together with a third-party equipment.

With the **Bittium Tough VoIP Network Extender™**'s SHDSL (Symmetric-High-Speed Digital Subscriber Line) connectivity, an IP network can be extended over long distances using conventional field wire. The Network Extender also features Ethernet and SHDSL connections to external networks and devices. With these products it is possible to provide wired connectivity and enhanced reliability of VoIP services regardless of availability of network services. Products are also easily integrated to existing IP infrastructure and are fully interoperable with commercial equipment.

The Bittium Tough VoIP product family was extended in April with **Bittium Tough VoIP Service™** software product, which can be used to connect both fixed data network users and wireless tactical data network users to the same voice service network.

**Bittium Tactical LTE Access Point™** is a solution providing LTE access to the Bittium TAC WIN network. With the solution, different troops can benefit from cost-efficient and high-speed multimedia data and VoIP services by using commercial smartphones as well as special terminals intended for authority use.



## Medical Technologies

Bittium offers its customers healthcare technology products and services in bio-signal measuring in the areas of cardiology, neurology, rehabilitation, occupational health and sports medicine. Combining healthcare technologies with Bittium's long-term experience and competence in wireless and security technologies gives Bittium good conditions to serve its customers in healthcare sector by offering them new kinds of products and services.

**Faros ECG Event and Faros ECG Mobile** are software solutions for remote heart monitoring, where the cardiac arrhythmia identified by the detection algorithms embedded in the Faros device is quickly passed to professionals for examination. The solutions enable patients' earlier repatriation and even better ability to react to potentially emerging arrhythmias faster.

**Faros Cardiac Rehab** is a solution for Cardiac rehabilitation real-time monitoring for up to 16 patients simultaneously. The solution enables more effective rehabilitation of the patients and increases their safety during training.

**NeurOne** is one of the most accurate and quickest EEG measuring devices in the world designed for research and clinical use. NeurOne system enables fully synchronized group measuring of up to 30 persons simultaneously for example in different types of psychological studies. The solution is optimized for use with transcranial magnetic stimulators (TMS-EEG), with optional possibility to use it during magnetic resonance imaging procedures (fMRI-EEG).



Faros

## Connectivity Solutions

In the Connectivity Solutions product and services area Bittium provides innovative design and development services to customers who demand the development of customized, purpose-built IoT devices according to industry-specific requirements. Bittium has strong expertise on system design, technology integration, wireless radio and antenna technologies, and power optimized, small form-factor device development. Bittium's competitiveness on these markets is based on strong technology and data security expertise, and on an established reputation for reliability and quality.

**Bittium wearable platform for health monitoring** is a wearable device platform integrated with four sensors: 3-axis accelerometer, Optical Heart Rate (OHR), skin temperature and EmoGraphy skin conductance sensor. These sensors allow the measurement of person's stress level, fatigue and sleeping quality. The wearable platform provides an easy way to develop and test new healthcare specific products and services such as remote patient monitoring or professional driving applications.

**BrainStatus** is a wireless compact EEG amplifier, which is used together with a disposable easy and quick to wear BrainStatus electrode headband for example to diagnose epileptic seizures and brain stroke. BrainStatus enables quick measurement in field conditions as well as in hospitals, thus making the treatment process of the patient faster.

## Business Development in 2016

Despite the decrease in the demand for R&D services for the mobile network manufacturers, the demand for Bittium's R&D services developed positively during 2016. Also, the demand for R&D services in the IoT markets developed positively. The product development project for the Mexican Ministry of Communication and Transportation, started in May 2015, has continued according to plans. Bittium develops Android-based mobile devices that use both terrestrial and satellite connection for their MEXSAT system.

In October, Bittium announced to have received information according to which significant customer cooperation with a global network equipment manufacturer will reduce during 2017. At that time, according to the information received, if the planned actions of the customer will materialize in full, Bittium estimated that these actions might have a negative effect to Bittium's net sales and operating result in 2017.

During 2016 Bittium continued the R&D investments in its own products and product platforms aiming for growth especially in the international mobile security, defense and public safety markets. The investments focused mainly in the further development of the Bittium Tough Mobile™ secure LTE smartphone targeted for the mobile security and public safety markets.





## Bittium Tough Mobile

Bittium Tough Mobile and related management system and VPN encryption Bittium Secure Suite™ have generated lots of interest in the information security and public safety markets. Bittium has been actively seeking for, and has found a few suitable partners and resellers who have taken Bittium Tough Mobile as part of their own product portfolio and/or solution for their customers. The product deliveries of Bittium Tough Mobile continued during the whole year. The awareness of information security risks is growing and the interest towards secure mobile devices is increasing, however, the development of the public safety and information security markets in 2016 was somewhat slower than expected.

In the turn of May-June at Critical Communications World exhibition in Amsterdam, Bittium launched a new Bittium Tough Mobile B28 frequency variant, which is targeted for public safety networks requiring this band 28. In addition, Bittium and Air-Lynx demonstrated the first public safety LTE evolved Multimedia Broadcast Multicast Solution (eMBMS) that enables efficient use of the whole LTE radio spectrum, delivering huge amounts of data even in a congested network environment. This is particularly important in public safety, security and other mission-critical communications, which require fast data speeds, low latencies and reliable connections.

In October, the company announced to have conducted the first ever Voice over LTE (VoLTE) call with Bittium Tough Mobile on the Public Safety Band 14 LTE Network in the United States.

### Bittium SafeMove Product Family

Bittium continued R&D investments in Bittium SafeMove product family and announced Bittium SafeMove Analytics software as a standalone software product for enterprises for monitoring and analyzing the performance of wireless networks and

mobile devices. Organizations that use Analytics will get real-time and historical data on the location of mobile devices and the performance of wireless networks and thus are able to enhance the efficiency and user experience of mobile workers.

In May, Bittium released a new software version of Bittium SafeMove Mobile VPN remote access solution. The new software version enhances the information security of mobile workers by supporting performance-improving encryption methods. Moreover, the new management user interface and support for mobile Android devices make the work of IT departments significantly easier.

In May, Bittium established a partnership with Getac to improve the productivity, security and user experience for field workers in challenging conditions. Bittium offers its SafeMove Mobile VPN and Analytics software to all Getac's rugged tablets and notebooks as an option across Europe from May 2016 onwards.

### Bittium Tough VoIP Product Family and Bittium TAC WIN System

The development of the tactical communication system Bittium Tactical Wireless IP Network (TAC WIN), used by the Finnish Defence Forces, continued during the year. The product deliveries for the communication system were continued during the whole year. Bittium received a new order for a new software package for the system. The main objective for the development work of the new software package is to continue enhancing the performance, data transfer capacity and survivability of the software and the related radio platform.

Bittium also continued efforts to bring its products and services, targeted to defense industry, to the international defense markets and received a small order of TAC WIN system in Asia. In November, the company announced to have received a purchase or-

der for a tactical communications system and related integration work to be delivered to the Estonian Defence Forces.

Bittium expanded its product portfolio in tactical communications by introducing Bittium Tough VoIP Service (Voice over Internet Protocol) software product. With the product both fixed data network users and wireless tactical data network users can be connected to the same voice service network. This significantly improves the capability to lead troops and maintain situational awareness in the quickly changing conditions of the battlefield.

### ESSOR (European Secure Software defined Radio) Cooperation Continued

Bittium has been part of the European ESSOR programme since it started in 2009. The aim of the program is to develop the European Software Defined Radio technology in order to improve the capabilities for cooperation in coalition operations.

In June, Bittium demonstrated together with both Italian company Leonardo and French company Thales how the land forces of different European countries will be able to communicate with each other in joint operations, linking up via a common waveform regardless of the actual radio platforms they use.

In December, Bittium demonstrated together with Leonardo, Thales and Finnish Defence Forces the capabilities and functionalities of the High Data Rate Waveform (HDRWF) developed in the European ESSOR programme in battlefield conditions.

### The Acquisition of Mega Electronics

In November, Bittium acquired Mega Electronics Ltd and MegaKoto Ltd, companies specialized in healthcare technology and services.

Mega Electronics Ltd (now: Bittium Biosignals Ltd), founded in 1983, is a Finnish ISO 13485 certified medical device manufacturing company.

The Company is specialized in biosignal measuring for cardiology, neurology, rehabilitation, occupational health and sports medicine. MegaKoto Ltd. (now Bittium Medanalytics Ltd.) provides comprehensive arrhythmia monitoring services for its customers such as primary care centers, private clinics and hospitals.

With this acquisition Bittium got the ownership of Faros product family, focused on heart remote monitoring, NeurOne product focusing on measuring the electrical activity of brain, and BrainStatus, a disposable quick analysis headband used in emergency and intensive primary care to diagnose for example epileptic seizures and brain stroke, and other healthcare technology products. Faros devices are EU medical device directive class CE class IIa and USA FDA 510(k) registered medical devices. Bittium Medanalytics Ltd is a private provider of healthcare services approved by the Finnish National Supervisory Authority for Welfare and Health having more than 70 health centers and private clinics using its heart monitoring Kardiolog.fi service. This acquisition was part of Bittium's strategy announced later in November.

## Market Outlook

Bittium's customers operate in various industries, each of them having their own industry specific factors driving the demand. A common factor creating demand among the whole customer base is the growing need for higher quality and secure data transfer. Due to the technology and measuring competences accrued over time and long history in developing mobile communication solutions, Bittium is in a good position to offer customized solutions for its customers.

The following factors are expected to create demand for Bittium's products and services in 2017 and beyond:

- In the mobile telecommunications, the 4G technology development work has decreased significantly affecting declining to the mobile network markets in the near

future. The development of 5G technology has started very well creating demand for Bittium's R&D services increasingly. However, the development of 5G technology has just begun, and it will not replace the amount of the 4G development work within the next few years. Therefore in the future the demand for R&D service for the network equipment manufacturers is expected to be significantly lower than in the previous years.

- As the digitalization evolves, the secure IoT (Internet of Things) has become a significant development area in many industries. The increasing need of companies to digitalize their operations, collect data wirelessly and transfer it to the internet and cloud services generate need for Bittium's services and customized solutions. For this there is a need for connected devices for consumers and demanding industrial usage that collect information through their sensors and connect the devices securely to the internet and cloud services. Also the integration of different systems and technologies play an important role in enabling the complete digitalization service. To ease and speed up the processing of large data amounts there are different kinds of learning systems and devices under development that use different kinds of artificial intelligence (AI) technologies.
- The use of LTE technology, smartphones and applications is expected to continue increasing in special verticals such as public safety creating demand for Bittium Tough Mobile secure LTE smartphone and other customized special terminals based on Bittium's own product platform. The awareness of mobile security risks is growing and the interest towards secure mobile devices is increasing. Also the interest towards LTE-SAT-hybrid devices with terrestrial and satellite connections has grown to further improve the functionality of authorities' critical connections. The sale of the secure terminal products is expected to develop moderately according to the nature of public safety markets.
- Using public network connections in portable devices is increasing also in demanding professional use, such as in the public sector. This creates requirements for network connections to be easy to use and secure. The products in the Bittium

SafeMove product family enable the ease of use of the devices and security in demanding use.

- In the defense sector's tactical communication market the governments' defense forces and other authorities need networks that troops, who are increasingly constantly on the move, can use for transferring growing amounts of data securely. This creates demand for Bittium Tactical Wireless IP Network (TAC WIN) broadband network and for other Bittium's IP-based (Internet Protocol) tactical communications solutions. Bittium continues its efforts to bring its defense market targeted products and services also to the international defense markets and aims to get new international customers for its tactical communication system in 2017. Due to the long sales cycles driven by purchasing programs of national governments, it takes years to receive significant purchase orders.
- Heart problems and brain strokes are among the most frequent causes of death. Recognizing the symptoms early on, based on information gathered by measuring, enables the start of the effective treatment fast. Also the prevention of diseases and health problems are being increasingly invested in. The healthcare technology market is ongoing a significant change in the patient care both inside the hospitals as well as in homecare. The repatriation of patients is being pursued earlier than before which may enable significant cost savings in the healthcare. One of the growing application areas in the IoT segment is healthcare technology that enables implementing these changes for its part. A prerequisite for early repatriation is the enabling of accurate and precise follow-up and measurement in home conditions through remote monitoring. For this purpose Bittium offers its Faros product family for remote heart monitoring and NeurOne product family for measuring the electrical activity of brain.

## Press Releases in 2016

### **22nd of December**

Bittium, Leonardo, Thales and the Finnish Defence Forces demonstrate ESSOR High Data Rate Waveform for joint operations in battlefield conditions

### **15th of November**

Bittium's subsidiary Mega Electronics Ltd. exhibits its latest innovative products and solutions for cardiology and neurology at Medica 2016 exhibition

### **3rd of November**

Bittium received a purchase order for a tactical communications system and related integration work to be delivered to the Estonian Defence Forces

### **3rd of November**

Bittium exhibits its products and solutions for tactical communications at Indo Defence 2016 exhibition

### **12th of October**

Bittium conducts the first VoLTE call in Public Safety LTE band 14 environment

### **12th of October**

Bittium exhibits its new wearable device platform at IoT Solutions World Congress 2016 in Barcelona

### **26th of September**

Bittium exhibits its secure and easy-to-use Bittium SafeMove remote access solutions at HETT Show 2016 in London

### **13th of June**

Bittium and Leonardo-Finmeccanica to demonstrate the first European cross-platform military radio technology for effective joint operations

### **13th of June**

Bittium exhibits its products and solutions for tactical communications at Eurosatory defense exhibition

### **31st of May**

Bittium and Air-Lynx launch world's first public safety LTE evolved Multimedia Broadcast Multicast Solution (eMBMS) solution

### **31st of May**

Bittium exhibits the Bittium Tough Mobile smartphone and announces its Band 28 variant for public safety at Critical Communications World 2016

### **24th of May**

Bittium and Getac partnered to improve productivity, security and user experience for field workers

### **24th of May**

Bittium exhibits its secure and easy-to-use Bittium SafeMove remote access solutions at Healthcare ICT conference 2016

### **23th of May**

Bittium releases new software version of Bittium SafeMove Mobile VPN remote access solution

### **20th of May**

Bittium SafeMove Analytics software is now also available for enterprises as a standalone software product

### **5th of April**

Bittium expands its product family in tactical communications with Bittium Tough VoIP Service™ software product

### **5th of April**

Bittium exhibits its customized, secure IoT solutions and engineering services at Hannover Messe 2016 industrial fair

### **22nd of March**

Digia Salpa mobile communications solution receives national information security classification in the Bittium Tough Mobile™ smartphone

### **14th of March**

Bittium exhibits its customized, secure IoT solutions and engineering services at Wearable Technology Show 2016

### **24th of February**

Bittium received a purchase order from the Finnish Defence Forces for a software upgrade for the Bittium TAC WIN system used in tactical communication

### **27th of January**

Bittium exhibits Bittium Tough Mobile smartphone, its device management and encryption software and IoT solutions at Mobile World Congress 2016

### **20th of January**

Bittium exhibits its secure and easy-to-use Bittium SafeMove remote access solutions at Long-Term Conditions Conference 2016



# Personnel

At the end of the year 2016 altogether 623 employees worked in Bittium in Finland, USA, Great Britain and Singapore. The amount of personnel increased by 106 from last year in Finland. Part of the increase in headcount was due to the business acquisition, when Bittium acquired the ownerships of Mega Electronics Ltd. and MegaKoto Ltd in November 2016. The average age of the personnel in Bittium was 41 years. R&D engineers and specialists constituted clearly the largest proportion of the personnel.

Bittium's core competences are strong and extensive know-how of radio technology, embedded software, electronics, and product integration. At Bittium the way of working is based on the implementation of Lean and Agile methods. The development of engineering competences has been further supported by virtual competence teams and trainings that are based on the current needs.

In 2016 the main focus of Bittium's personnel's competence development has been in developing the software design process in all software levels and in utilizing the Open Source methods more efficiently. A new focus area has been the implementation of the DevOps operation models, where the aim is to improve the dialogue between R&D operations and to facilitate agile changes in the production phase of the software development. In relation to the digitalization, DevOps is a growing product development model. The development of the model also supports strongly the development of our own personnel's competences and the adoption of new, fast and agile working methods. During fall 2016 we arranged own Hackathon events where the development of competence and productivity were combined in a natural, inspiring way that facilitates innovation. Other im-

portant competence development areas were development of information security, especially in software development, utilization of 5G technology, and back- and front-end development.

During 2016 Bittium continued to participate in the DIMECC N4S (Need for Speed) program. In this program, the focus is on more rapid and regular version releases, continuous integration and development of test automation chains, as well as increasing transparency, real time feedback and collecting quality data throughout the whole chain from suppliers to customers. The program is widely utilized in product development and in managing the production chain, which increases productivity and fluency of the work. The results of our employee and customer satisfaction surveys have furthermore improved, which reflects the achievements of the program.

Accelerate, a program where the aim is at creating and maintaining a growth basis for innovations, also continued as a development model in 2016. In the program, the working models and tools for Bittium's innovation work were furthermore developed. Through the tool the personnel can share ideas in a transparent easy-to-use forum that enables discussion and co-develop-

ment. The results of this program received good feedback e.g. at the EU EUREKA cluster's ITEA Digital Masterclass benchmark forum.

In 2016 we continued to improve leadership skills and wellbeing also through the processes of supervisor work. A new Quarter Chat process was implemented to facilitate good coaching leadership. In this new model of supervisory work the supervisor meets the subordinates more frequently and informally. The enhanced interaction helps in building mutual trust, which enables better and more real time support to work fluency, competence development and wellbeing. The previously used more formal development discussion was removed from the annual clock, but employees can still reserve time for a development discussion with their supervisors whenever it is needed and topical from the competence development point of view. This reform was received well; in a survey carried out in early fall 2016, the general opinion of the persons who had "Quarter Chatted" with their supervisors, was that these discussion had been very useful.

Also the BES 2016 (Bittium Employee survey) result showed, that employees are more satisfied than before with the supervisor work and the company's operations in general. The results of the annual employee survey improved significantly already in 2015, and the increase in the scores of all parts of the survey continued moderately also in 2016. Especially the employees felt, that they were better informed of the operations and strategy of the company than before. The survey carried out in October set an all-time record in response rate, 77 percent.



# Shares and Shareholders

## Shares

The shares of Bittium Corporation are quoted on the Nasdaq Helsinki. The company has one series of shares. All shares entitle their holders to dividends of equal value. Each share has one vote. The share does not have a nominal value. The company's shares have been entered into the Euroclear Finland Ltd.'s book entry system.

At the end of the financial period, the fully paid share capital of the company entered into the Finnish Trade Register was EUR 12,941,269 and the total number of the shares was 35,693,166. The accounting par value of the company's share is EUR 0.10. The company does not have its own shares in its possession.

## Option Rights

The Annual General Meeting of March 14, 2008, decided to issue stock options to Bittium group's (former Elektrobit group) key personnel. The maximum number of stock options was 4,200,000, of which 1,400,000 were marked with the symbol 2008A, 1,400,000 were marked with the symbol 2008B and 1,400,000 were marked with the symbol 2008C. The stock options entitled to subscription of a maximum total of 4,200,000 new shares of the company or treasury shares.

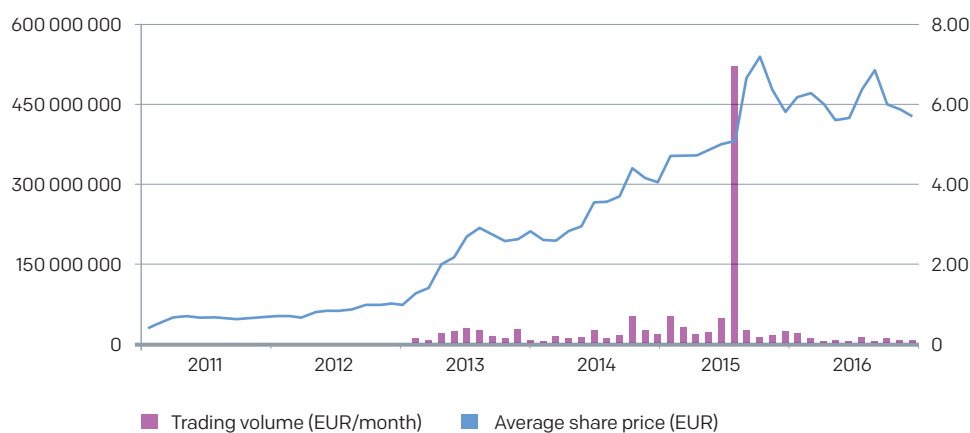
The proportion of the shares that were to be subscribed using the stock options to be issued was a maximum total of 3.1 percent of the company's shares and associated voting rights after a possible share subscription, if new shares were to be issued in the subscription. The subscription price for the shares to be subscribed based on the stock options was based on the prevailing market value of the Bittium Corporation share at Nasdaq Helsinki in January 2009, January 2010 and January 2011. The subscription price was to be recorded in the fund for invested unrestricted equity. The share subscription period for stock options 2008A was 1 April 2012–31 March 2014, for stock options 2008B 1 April 2013–31 March 2015, and for stock options 2008C 1 April 2014–31 March 2016.

The Board of Directors of Bittium Corporation decided on June 5, 2013 on the transfer of stock options 2008A and 2008B to the Finnish book-entry system and to apply for listing of 1,400,000 stock options 2008A and of 1,400,000 stock options 2008B on the official list of Nasdaq Helsinki. The trading with the stock options started on June 17, 2013. The share subscription period for stock options 2008A ended on March 31, 2014 and the share subscription period for stock options 2008B ended on March 31, 2015.

The Board of Directors of Bittium Corporation decided on the transfer of series 2008C stock options to the Finnish book-entry system on December 20, 2013 and applied for listing of 1,400,000 stock options 2008C on the official list of Nasdaq Helsinki. Application was made for the listing to commence on April 1, 2014. The share subscription period for series 2008C stock options commenced on April 1, 2014 and ended on March 31, 2016.

A total of 55,498 new shares in Bittium Corporation were subscribed for between December 1, 2015 and March 31, 2016 by virtue of the option rights 2008C. The share subscription price, EUR 30,523.90 was recorded in the company's invested non-restricted equity fund. The corresponding increases in the number of the company's shares were entered into the Finnish Trade Register on February 10, 2016 and April 14, 2016 as an additional lot of Bittium Corporation's shares in Nasdaq Helsinki Ltd. The share subscription period for stock options 2008C ended on March 31, 2016. More information and terms and conditions of stock options 2008 are available in the Company's web pages at [www.bittium.com/investor\\_relations](http://www.bittium.com/investor_relations).

Trading volume and average share price 2011–2016





## Share Price and Trading Volumes in 2016

The closing price of Bittium Corporation's share was EUR 5.67 at the end of 2016; the share reached a high of EUR 7.40 and a low of EUR 5.15. During the year, a total of 20.9 million shares with the value of EUR 126.4 million changed hands on the Nasdaq Helsinki. This is 58.6 percent of the share capital. Bittium Corporation's market capitalization on December 31, 2016 was EUR 202.4 million.

## Dividend and Dividend Policy

Bittium Corporation follows a dividend policy that takes into account the group's net income, financial situation, need for capital and financing of growth.

In 2016 Bittium Corporation paid EUR 0.05 per share as dividend based on the adopted balance sheet for the financial period January 1, 2015–December 31, 2015 and EUR 0.25 per share as additional dividend. The dividend was paid to the shareholders who were registered as shareholders in the company's register of shareholders as maintained by Euroclear Finland Ltd. on the dividend record date, April 21, 2016. The dividend was paid on April 28, 2016.

The Board of Directors proposes that the Annual General Meeting to be held on April 12, 2017 resolve to pay EUR 0.05 per share as dividend from the profit of the financial period based on the adopted balance sheet for the financial period of January 1, 2016–December 31, 2016 and EUR 0.25 per

share as additional dividend. The dividend will be paid to the shareholders who are registered as shareholders in the company's register of shareholders as maintained by Euroclear Finland Ltd on the dividend record date, April 18, 2017. The Board of Directors proposes that the dividend be paid on April 25, 2017.

## Trading Codes

Bittium Corporation has been listed on Nasdaq Helsinki (previously Helsinki Stock Exchange) since 1998. Bittium Corporation's company code and trading code in the Nasdaq Helsinki INET system is BITTI and the trading code BITTI.

### Trading codes are:

Nasdaq Helsinki	BITTI
Reuters	BITTI.HE
Bloomberg	BITTIFH

## Shareholders

At the end of 2016 Bittium Corporation had 21,424 shareholders. The ten largest shareholders owned 29.2 percent of the shares. Private ownership was 78.4 percent. The percentage of foreign and nominee-registered shareholders was 3.4 percent at the end of 2016.

## Shareholding of the Board of Directors and CEO

At the end of 2016, the shareholding of the Board of Directors, CEO and the companies controlled by them was 1,578,631 shares, corresponding to 4.4 percent of all shares.

## Information to Shareholders

Press releases, reports, earnings estimates, share price ticker, contact details of analysts and other current investor material can be found on the company's website at [www.bittium.com](http://www.bittium.com). An email-based subscription service for press releases and publications can be found from the company's website as well.

## Financial Reports in 2017

Bittium has reported its financial development quarterly. On November 23, Bittium announced a change to its financial reporting practice and will publish half year and annual financial reports and no longer interim reports for the first three and nine months of the year. In 2017, Bittium will publish financial reports as follows:

### February 20, 2017

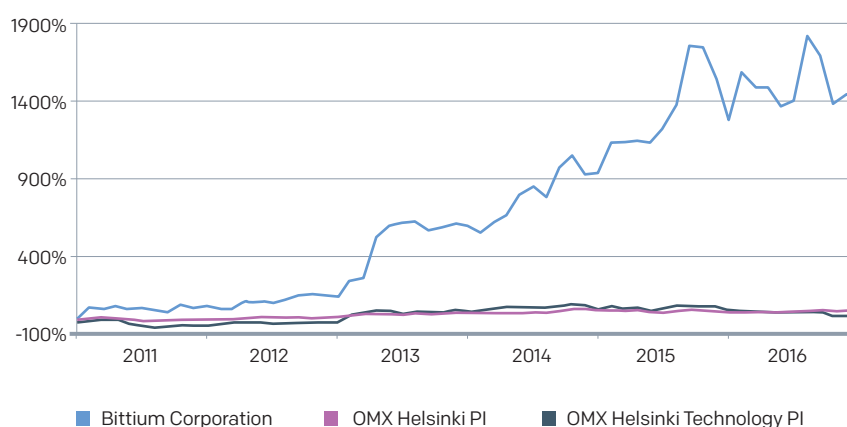
Financial Statement Bulletin 2016

### August 9, 2017

Half Year Financial Report, Jan.–Jun. 2017

Financial reports will be published simultaneously in Finnish and in English at 8.00 a.m. (CET+1) on Bittium's web pages at [www.bittium.com/investors](http://www.bittium.com/investors). The company will hold press conference regarding the reports on dates to be specified later.

## Share price development in Nasdaq Helsinki 2011–2016



## Silent Periods in 2017

Bittium will observe a Silent Period prior to announcing its results. The Silent Periods in 2017 are as follows:

January 30–February 20, 2017

July 19–August 9, 2017

## The Annual General Meeting 2017 of Bittium Corporation

The Annual General Meeting of Bittium Corporation will be held on Wednesday, April 12, 2017 at 1.00 p.m. in University of Oulu at the address Saalastinsali, Pentti Kaiteran katu 1, 90590 Oulu.

### Shareholders Registered in the Shareholders' Register

Each shareholder, who is registered on Friday, March 31, 2017 in the shareholders' register of the company held by Euroclear Finland Ltd., has the right to participate in the General Meeting. A shareholder, whose shares are registered on his/her personal Finnish book-entry account, is registered in the shareholders' register of the company.

A shareholder, who is registered in the shareholders' register of the company and who wants to participate in the General Meeting, shall register for the meeting no later than on Friday, April 7, 2017 by 10.00 a.m. by giving a prior notice of participation.

The notice has to be received by the company before the end of the registration period. The notice has to be received by the company before the end of the registration period. Such notice can be given:

- a) on the company's website at [www.bittium.com](http://www.bittium.com), as from March 2, 2017 at 10.00 a.m.
- b) by telephone +358 40 344 3322 or +358 40 344 5425 on weekdays between 9.00 a.m. and 3.00 p.m.
- c) by telefax; +358 8 343 032; or
- d) by regular mail to the address Bittium Corporation, General Meeting, Tutkijantie 8, 90590 Oulu, Finland.

In connection with the registration, a shareholder shall notify his/her name, personal identification number or business identity

code, address, telephone number and the name of a possible assistant or proxy representative and the personal identification number of a proxy representative. The personal data given to Bittium Corporation is used only in connection with the General Meeting and with the processing of related registrations.

The shareholder, his/her authorized representative or proxy representative shall, where necessary, be able to prove his/her identity and/or right of representation at the General Meeting.

### Holders of Nominee Registered Shares

A holder of nominee registered shares has the right to participate in the General Meeting by virtue of such shares, based on which he/she on Friday, March 31, 2017 would be entitled to be registered in the shareholders' register of the company held by Euroclear Finland Ltd. The right to participate in the General Meeting requires, in addition, that the shareholder on the basis of such shares has been registered into the temporary shareholders' register held by Euroclear Finland Ltd. at the latest on Friday, April 7, 2017 by 10.00 a.m. As regards nominee registered shares this constitutes due registration for the General Meeting.

A holder of nominee registered shares is advised to request without delay the necessary instructions regarding registration in the temporary shareholder's register, the issuing of proxy documents and registration for the General Meeting from his/her custodian bank. The account management organization of the custodian bank has to register a holder of nominee registered shares, who wants to participate in the General Meeting, into the temporary shareholders' register of the company at the latest by the time stated above.

Further information on the General Meeting and participation in the General Meeting is available on the company's website [www.bittium.com](http://www.bittium.com).

### Proxy Representative and Powers of Attorney

A shareholder may participate in the General Meeting and exercise his/her rights at

the meeting by way of proxy representation. A proxy representative shall produce a dated proxy document or otherwise in a reliable manner demonstrate his/her right to represent the shareholder. If a shareholder participates in the General Meeting by means of several proxy representatives representing the shareholder with shares at different securities accounts, the shares by which each proxy representative represents the shareholder shall be identified in connection with the registration for the General Meeting.

Possible proxy documents should be delivered in originals to the address Bittium Corporation, General Meeting, Tutkijantie 8, 90590 Oulu, Finland, before the end of the registration period.

### Other Information

Pursuant to chapter 5, section 25 of the Companies Act, a shareholder who is present at the General Meeting has the right to request information with respect to the matters to be considered at the meeting. On the date of this notice to the General Meeting March 2, 2017, the total number of shares and votes in Bittium Corporation is 35,693,166.

### Documents of the General Meeting

The above-mentioned proposals for the decisions on the matters on the agenda of the General Meeting as well as this notice are available on Bittium Corporation's website at [www.bittium.com](http://www.bittium.com).

The annual report of Bittium Corporation, which includes the company's annual accounts, the report of the board of directors and the auditor's report, as well as the company's corporate governance statement, is available on said website no later than on Wednesday March 22, 2017. The proposals for decisions and other documents mentioned above are also available at the General Meeting. Copies of these documents and of this notice will be sent to shareholders upon request. The minutes of the General Meeting will be available on the above-mentioned website as from Wednesday April 26, 2017, at the latest.







Connectivity to be trusted.  
[www.bittium.com](http://www.bittium.com)



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