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Form 10-K
February 21, 2019
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UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

FORM 10-K

ý **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**
For the fiscal year ended December 31, 2018
or
¨ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**
For the transition period from _____ to _____
Commission File Number 0-23081

FARO TECHNOLOGIES, INC.
(Exact name of Registrant as Specified in Its Charter)

Florida	**59-3157093**
(State or Other Jurisdiction of Incorporation or Organization)	**(I.R.S. Employer Identification Number)**
250 Technology Park, Lake Mary, FL	**32746**
(Address of Principal Executive Offices)	**(Zip Code)**

Registrant's telephone number, including area code: (407) 333-9911
Securities registered pursuant to Section 12(b) of the Act:

Title of each class	**Name of each exchange on which registered**
Common Stock, par value $.001	**Nasdaq Global Select Market**

Securities registered pursuant to Section 12(g) of the Act: None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ¨ No ý
Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes ¨ No ý
Indicate by check mark whether the registrant: (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ý No ¨

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Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§ 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ý No ¨
Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§229.405) is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K.¨

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company" and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer	ý	Accelerated filer ¨
Non-accelerated filer	¨	Smaller reporting company ¨
		Emerging growth company ¨

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ¨
Indicate by check mark whether the Registrant is a shell company (as defined in Rule 12b-2 of the Act).
Yes ¨ No ý
The aggregate market value of the Registrant's common stock held by non-affiliates of the Registrant on June 29, 2018 (the last business day of the Registrant's most recently completed second fiscal quarter) was $906,879,697 based on the closing price of the Registrant's common stock on such date on the Nasdaq Global Select Market, and assuming solely for the purposes of this calculation that all directors and executive officers of the Registrant are "affiliates."
As of February 15, 2019, there were outstanding 17,253,011 shares of the Registrant's common stock.
DOCUMENTS INCORPORATED BY REFERENCE
Portions of the Registrant's proxy statement for the 2019 Annual Meeting of Shareholders are incorporated by reference in Part III of this Annual Report on Form 10-K.

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PART I

CAUTIONARY STATEMENTS FOR FORWARD-LOOKING INFORMATION

FARO Technologies, Inc. ("FARO," the "Company," "us," "we" or "our") has made "forward-looking statements" in this Ann Report on Form 10-K within the meaning of Section 27A of the Securities Act of 1933, as amended, or the Securities Act, and Section 21E of the Securities Exchange Act of 1934, as amended, or the Exchange Act. Statements that are not historical facts or that describe our plans, beliefs, goals, intentions, objectives, projections, expectations, assumptions, strategies, or future events are forward-looking statements. In addition, words such as "may," "might," "would," "will," "will be," "future," "strategy," "believe," "plan," "should," "could," "seek," "expect," "anticipate," "intend," " "objective," "project," "forecast," "target" and similar words identify forward-looking statements.

Forward-looking statements are not guarantees of future performance and are subject to a number of known and unknown risks, uncertainties, and other factors that could cause actual results to differ materially from those expressed or implied by such forward-looking statements. Consequently, undue reliance should not be placed on these forward-looking statements. We do not intend to update any forward-looking statements, whether as a result of new information, future events, or otherwise, unless otherwise required by law. Important factors that could cause actual results to differ materially from those contemplated in such forward-looking statements include, among others, the following:

- an economic downturn in the manufacturing industry or the domestic and international economies in the regions of the world where we operate;
- our inability to further penetrate our customer base and target markets;
- development by others of new or improved products, processes or technologies that make our products less competitive or obsolete;
- our inability to maintain what we believe to be our technological advantage by developing new products and enhancing our existing products;
- the results of our internal review and our outside legal counsel's review of our pricing and other practices under our General Services Administration Federal Supply Schedule contracts, the outcome of the U.S. Government's review of, or investigation into, our potential overcharging of the U.S. Government under such contracts, any resulting penalties, damages or sanctions imposed on us and the outcome of any resulting litigation to which we may become a party, loss of future government sales and potential impacts on customer and supplier relationships and our reputation;
- risks associated with expanding international operations, such as difficulties in staffing and managing foreign operations, increased political and economic instability, compliance with potentially evolving import and export regulations, and the burdens and potential exposure of complying with a wide variety of U.S. and foreign laws and labor practices;
- changes in trade regulation, which result in rising prices of imported steel, steel byproducts, aluminum, and aluminum byproducts used as raw materials in the production of measurement devices, and our ability to pass those costs on to our customers or require our suppliers to absorb such costs;
- changes in foreign regulation, which may result in rising prices of our measurement devices sold as exports to our international customers, our customers' willingness to absorb incremental import tariffs, and the corresponding impact on our profitability;
- our inability to successfully identify and acquire target companies and achieve expected benefits from, and effectively integrate, acquisitions that are consummated;
- the cyclical nature of the industries of our customers and material adverse changes in our customers' access to liquidity and capital;
- change in the potential for the computer-aided measurement ("CAM2") market and the potential adoption rate for our products, which are difficult to quantify and predict;
- our inability to protect our patents and other proprietary rights in the United States and foreign countries;
- our inability to adequately establish and maintain effective internal controls over financial reporting;
- fluctuations in our annual and quarterly operating results and the inability to achieve our financial operating targets as

a result of a number of factors including, without limitation (i) litigation and regulatory action brought against us, (ii) quality issues with our products, (iii) excess or obsolete inventory, shrinkage or other inventory losses due to product

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obsolescence, change in demand for our products, scrap or material price changes, (iv) raw material price fluctuations and other inflationary pressures, (v) expansion of our manufacturing capability, (vi) the size and timing of customer orders, (vii) the amount of time that it takes to fulfill orders and ship our products, (viii) the length of our sales cycle to new customers and the time and expense incurred in further penetrating our existing customer base, (ix) manufacturing inefficiencies associated with new product introductions, (x) costs associated with new product introductions, such as product development, marketing, assembly line start-up costs and low introductory period production volumes, (xi) the timing and market acceptance of new products and product enhancements, (xii) customer order deferrals in anticipation of new products and product enhancements, (xiii) the inability of our sales and marketing programs to achieve their sales targets, (xiv) start-up costs associated with opening new sales offices outside of the United States, (xv) fluctuations in revenue without proportionate adjustments in fixed costs, (xvi) inefficiencies in the management of our inventories and fixed assets, (xvii) compliance with government regulations including health, safety, and environmental matters, and (xviii) investment costs associated with the training and ramp-up time for new sales people;

- changes in gross margin due to a changing mix of products sold and the different gross margins on different products and sales channels;
- changes in applicable laws, rules or regulations, or their interpretation or enforcement, or the enactment of new laws, rules or regulations that apply to our business operations or require us to incur significant expenses for compliance;
- our inability to successfully comply with the requirements of the Restriction of Hazardous Substances (“ROHS2”) Directive and the Waste Electrical and Electronic Equipment (“WEEE”) Directive in the European Union;
- the inability of our products to displace traditional measurement devices and attain broad market acceptance;
- the impact of competitive products and pricing on our current offerings;
- our ability to successfully complete our Chief Executive Officer transition or the loss of other key personnel;
- difficulties in recruiting research and development engineers and application engineers;
- the failure to effectively manage the effects of any future growth;
- the impact of reductions or projected reductions in government spending, or uncertainty regarding future levels of government expenditures, particularly in the defense sector;
- variations in our effective income tax rate, which make it difficult to predict our effective income tax rate on a quarterly and annual basis, and the impact of the U.S. Tax Cuts and Jobs Act of 2017 on the global intangible low-taxed income of foreign subsidiaries;
- the loss of key suppliers and the inability to find sufficient alternative suppliers in a reasonable period of time or on commercially reasonable terms;
- the impact of fluctuations in exchange rates;
- the effect of estimates and assumptions with respect to critical accounting policies and the impact of the adoption of recently issued accounting pronouncements;
- the magnitude of increased warranty costs from new product introductions and enhancements to existing products;
- the sufficiency of our plants to meet manufacturing requirements;
- the continuation of our share repurchase program;
- the sufficiency of our working capital and cash flow from operations to fund our long-term liquidity requirements;
- the impact of geographic changes in the manufacturing or sales of our products on our effective income tax rate; and
- our ability to comply with the requirements for favorable income tax rates in foreign jurisdictions.

A detailed discussion of these and other risks and uncertainties that could cause actual results and events to differ materially from such forward-looking statements is included throughout this filing and particularly in Part I, Item 1A of this Annual Report on Form 10-K. Moreover, new risks and uncertainties emerge from time to time, and we undertake no obligation to update publicly or review the risks and uncertainties included in this Annual Report on Form 10-K, unless otherwise required by law.

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ITEM 1. BUSINESS

FARO was founded in 1982 and re-incorporated in Florida in 1992. Our worldwide headquarters are located at 250 Technology Park, Lake Mary, Florida 32746 and our telephone number is (407) 333-9911.

We are a global technology company that designs, develops, manufactures, markets and supports software driven, three-dimensional ("3D") measurement and imaging solutions. This technology permits high-precision 3D measurement, imaging and comparison of parts and complex structures within production and quality assurance processes. Our devices are used for inspection of components and assemblies, rapid prototyping, reverse engineering, documenting large volume or structures in 3D, surveying and construction, as well as for investigation and reconstruction of accident sites or crime scenes. We sell the majority of our products through a direct sales force across a broad number of customers in a range of manufacturing, industrial, architecture, surveying, building information modeling, construction, public safety forensics, cultural heritage, dental, and other applications. Our FaroArm®, FARO ScanArm®, FARO Laser Tracker™, FARO Cobalt Array Imager, FARO Laser Projector, and their companion CAM2®, BuildIT, and BuildIT Projector software solutions, provide for Computer-Aided Design ("CAD") based inspection, factory-level statistical process control, high-density surveying, and laser-guided assembly and production. Together, these products integrate the measurement, quality inspection, and reverse engineering functions with CAD and 3D software to improve productivity, enhance product quality, and decrease rework and scrap in the manufacturing process, mainly supporting applications in our 3D Manufacturing (formerly known as "Factory Metrology" and "3D Factory") vertical. Our FARO Focus, FARO ScanPlan and FARO Scanner Freestyle3D X laser scanners, and their companion FARO SCENE, BuildIT, FARO As-Built™, and FARO Zone public safety forensics software offerings, are utilized for a wide variety of 3D modeling, documentation and high-density surveying applications in our Construction Building Information Modeling ("Construction BIM," formerly known as "Construction BIM-CIM") and Public Safety Forensics verticals. Our FARO ScanArm®, FARO Cobalt Array Imager, FARO Scanner Freestyle3D X laser scanners and their companion SCENE software, and other 3D structured light scanning solutions specific to the dental industry, also enable a fully digital workflow used to capture real world geometry for the purpose of empowering design, enabling innovation, and speeding up the design cycle, supporting our 3D Design (formerly known as "Product Design") vertical. Our line of galvanometer-based scan heads and laser scan controllers are used in a variety of laser applications and are integrated into larger components and systems, supporting our Photonics vertical.

Industry Background

We believe four principal forces drive the need for our products and services: 1) the widespread use by manufacturers of CAD in product development, which shortens product cycles; 2) the adoption by manufacturers of quality standards such as Six Sigma and ISO 9001 (and its offshoot QS 9000), which stress the measurement of every step in a manufacturing process to reduce or eliminate defects; 3) the inability of traditional measurement devices to address many manufacturing problems such as throughput, efficiency and accuracy, especially with respect to large components for products such as automobiles, aircraft, heavy duty construction equipment and factory retrofits; and 4) the growing demand to capture and synthesize large volumes of three-dimensional data for modeling and analysis.

CAD improves the manufacturing process. The creation of physical products involves the processes of design, engineering, production, and measurement and quality inspection. These basic processes have been profoundly affected by the computer hardware and software revolution that began in the 1980s. CAD software was developed to automate the design process, providing manufacturers with computerized 3D design capability and shortening the time between design changes. Today, most manufacturers use some form of CAD software to create designs and engineering specifications for new products and to quantify and modify designs and specifications for existing products. While manufacturers previously designed their products to remain in production for longer periods of time, current manufacturing practices must accommodate more frequent product introductions and modifications, while satisfying more stringent quality and safety standards. Assembly fixtures and measurement tools must be linked to the CAD design to enable production to keep up with the rate of design change.

Quality standards dictate measurement to reduce defects. QS 9000 is the name given to the Quality System requirements of the automotive industry developed by Fiat Chrysler Automobiles N.V. (formerly Chrysler Corporation), Ford Motor Company, General Motors Company and major truck manufacturers. Companies registered

under QS 9000 are considered to have higher standards and better quality products. Six Sigma is a set of quality standards that embodies the principles of total quality management, focused on measuring results and reducing product or service failure rates to 3.4 per million. All aspects of a Six Sigma company's infrastructure must be analyzed and, if necessary, restructured to increase revenues and raise customer satisfaction levels. The all-encompassing nature of these and other quality standards has resulted in manufacturers measuring every aspect of their processes, including stages of product assembly that may never have been measured before, in part, because of the lack of suitable measurement equipment.

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Traditional products do not measure up. A significant aspect of the manufacturing process entails measurement and quality inspection. Historically, manufacturers have measured and inspected products using hand-measurement tools such as scales, calipers, micrometers and plumb lines for simple measuring tasks, test (or check) fixtures for certain large manufactured products, and traditional (or fixed) coordinate measurement machines ("CMM") for objects that require higher precision measurement. However, the broader utility of each of these measurement methods is limited. Although hand-measurement tools are often appropriate for simple geometric measurements, including hole diameters or length and width of a rectangular component, their use for complex part measurements, such as the fender of a car, is limited. Also, these devices do not allow for the measurements to be directly compared electronically to the CAD model of the part. Test fixtures (customized fixed tools used to make comparative measurements of complex production parts to "master parts") are relatively expensive and must be reworked or discarded each time a dimensional change is made in the part being measured. In addition, these manual measuring devices do not permit the manufacturer to electronically compare the dimensions of an object with its CAD model.

Conventional CMMs are generally large, fixed-base machines that provide very high levels of precision and provide a link to the CAD model of the object being measured. However, fixed-base CMMs require that the object being measured be brought to the CMM and fit within the CMM's measurement grid. As manufactured subassemblies increase in size and become integrated into even larger assemblies, they become less transportable, thus diminishing the utility of a conventional CMM. Consequently, manufacturers must continue to use hand-measurement tools, or expensive customized test fixtures, to measure large or unconventionally shaped objects. In addition, some parts or assemblies are not easily accessible and cannot be measured using traditional devices.

The market demands three-dimensional data. Various factors contribute to market demand for FARO products and services. Conventional surveying equipment is limited to single-point measurements and does not have the capacity to capture and analyze large volumes of 3D data. As data requirements for construction, civil engineering and public safety applications become more complex, single-point measurement devices will become increasingly more difficult to utilize in those applications.

Escalating global competition has created a demand for higher quality products with shorter life cycles. Customers require more rapid design, greater control of the manufacturing process, tools to compare components to their CAD specifications, the ability to precisely measure components that cannot be measured or inspected by conventional devices, and the ability to capture and analyze large volumes of 3D data. Moreover, they increasingly require measurement capabilities to be integrated into manufacturing processes and to be available on the factory floor. These changing demands have contributed to the demand for FARO's products and services.

Business Segments and Markets

In 2016, we reorganized our business to align our sales, marketing, and product management to specific vertical markets and better redefine our end market applications. We report our segment information in accordance with the provisions of Financial Accounting Standards Board ("FASB") Accounting Standards Codification ("ASC") Topic 280, *Segment Reporting* ("FASB ASC Topic 280"). We evaluate business performance based upon several metrics, using revenue growth and segment profit as the primary financial measures. As a result of the reorganization of our business in 2016 and our assessments of our vertical markets since such time, we now report our activities in the following three reporting segments:

3D Manufacturing. The 3D Manufacturing reporting segment contains solely our 3D Manufacturing vertical, which provides both standardized and customized solutions for 3D measurement and inspection in an industrial or manufacturing environment. Applications include alignment, part inspection, dimensional analysis, first article inspection, incoming and in-process inspection, machine calibration, non-contact inspection, robot calibration, tool building and set-up, and assembly guidance.

Construction BIM. The Construction BIM reporting segment contains solely our Construction BIM vertical and provides solutions for as-built data capturing and 3D visualization in building information modeling applications, allowing our customers in the architecture, engineering and construction markets to quickly and accurately extract two-dimensional ("2D") and 3D measurement points. Applications include as-built documentation, construction monitoring, surveying, asset and facility management, and heritage preservation.

Emerging Verticals. The Emerging Verticals reporting segment includes our 3D Design, Public Safety Forensics and Photonics verticals. Our 3D Design vertical provides advanced 3D solutions to capture and edit 3D shapes of products, people, and/or environments for design purposes in product development, computer graphics, and dental and medical applications. Our

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Public Safety Forensics vertical provides solutions to public safety officials and professionals to capture environmental or situational scenes in 2D and 3D for crime, crash and fire scene investigations and environmental safety evaluations. Our Photonics vertical develops and markets galvanometer-based laser steering products and solutions.

All operating segments that do not meet the criteria to be reporting segments are aggregated in the Emerging Verticals reporting segment and have been combined based on the aggregation criteria and quantitative thresholds in accordance with the provisions of FASB ASC Topic 280. Each segment is responsible for its own product management, sales, strategy and profitability.

Recent Acquisitions and Equity Investment

Opto-Tech SRL. In July 2018, we acquired all of the issued and outstanding corporate capital of Opto-Tech SRL and its subsidiary Open Technologies SRL, a 3D structured light scanning solution company located in Brescia, Italy. The acquisition supports our 3D Design vertical and our long-term strategy to establish a presence in 3D measurement technology used in other industries and applications, especially dental and medical.

Lanmark Controls, Inc. In July 2018, we acquired all of the outstanding shares of Lanmark Controls, Inc. ("Lanmark"), a high-speed laser marking control boards and laser marking software provider located in Acton, Massachusetts. The acquisition supports the development of components used in new 3D laser inspection product development in order to further expand the product portfolio of our Photonics vertical.

Present4D GmbH. In April 2018, we invested in Present4D GmbH ("Present4D"), a software solutions provider for professional virtual reality presentations and training environments, in the form of an equity capital contribution. This contribution represents a minority investment in Present4D and supports our Public Safety Forensics vertical.

Laser Controls Systems Limited. In March 2018, we acquired all of the outstanding shares of Laser Control Systems Limited, a laser component technology business located in Bedfordshire, United Kingdom, which specializes in the design and manufacture of advanced digital scan heads and laser software. Similar to our acquisition of Lanmark, this acquisition supports our Photonics vertical and our long-term strategy to expand our presence and product portfolio in Photonics applications.

Photocore AG. In March 2018, we acquired all of the outstanding shares of Photocore AG, a vision-based 3D measurement application and software developer located in Zürich, Switzerland. The acquisition supports our Construction BIM vertical and our long-term strategy to improve our existing software offerings with innovative technology in photogrammetry.

Instrument Associates, LLC. In April 2017, we acquired substantially all of the assets of Instrument Associates, LLC d/b/a Nutfield Technology, a component technology business located in Hudson, New Hampshire, which specializes in the design and manufacture of advanced galvanometer-based optical scanners, scan heads and laser kits. The acquisition supports our Photonics vertical and our long-term strategy to expand our presence in key markets and improve our existing product lines with innovative technology.

FARO Products

FaroArm®. The FaroArm® is a combination of a portable, articulated measurement arm, a computer, and CAM2® software programs, which are described below under "FARO Software" and are primarily sold in the 3D Manufacturing and 3D Design verticals.

Articulated Arm – The articulated arm is comprised of three major joints, each of which may consist of one, two or three axes of motion. The articulated arm is available in a variety of sizes, configurations and precision levels suitable for a broad range of applications. To take a measurement, the operator simply touches the object to be measured with a probe at the end of the arm and presses a button. Data can be captured at either individual points or a series of points. Optical encoders, located at each of the joints of the arm, measure the angles at those joints. This rotational measurement data is transmitted to an on-board controller that converts the arm angles to precise locations in 3D space using "xyz" position coordinates and "ijk" orientation coordinates.

In August 2018, we released the FARO 8-Axis FaroArm® which is a comprehensive solution that combines either the portable Quantum FaroArm®, Quantum ScanArm or Design ScanArm® portfolio products with a functionally integrated, yet physically separate, 8th axis.

- ***Computer*** – We pre-install our CAM2® software primarily on either a notebook or desktop-style computer, depending on the customer's need, and the measurement arm, computer and installed software are sold as a system. We purchase the computers sold with our products from various suppliers.

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FARO ScanArm®. The FARO ScanArm® is a FaroArm equipped with a combination of a hard probe (like that in the FaroArm®) and a non-contact laser line probe. This product provides our customers with the ability to measure products without touching them. The ScanArm® is used for contact and non-contact measurement applications, including inspection, cloud-to-CAD comparison, rapid prototyping, reverse engineering and 3D modeling. This product is primarily sold in the 3D Manufacturing and 3D Design verticals.

FARO Design ScanArm®2.5C and FARO Prizm™. The FARO Design ScanArm®2.5C is a color-capable, portable lightweight 3D ScanArm. Using the new FARO Prizm™ full-color Laser Line Probe with 3D design and modeling software, the FARO Design ScanArm®2.5C delivers high-resolution, color point-cloud data, enabling more insight into object design and creation.

FARO Laser Tracker™. The FARO Laser Tracker™ combines a portable, large-volume laser measurement tool, a computer, and CAM2® software programs, representing a product offering primarily sold in the 3D Manufacturing vertical.

- ***Laser Tracker Vantage*** – The FARO Laser Tracker Vantage utilizes an ultra-precise laser beam to measure objects of up to 80 meters. It enables manufacturing, engineering, and quality control professionals to measure and inspect large parts, machine tools and other large objects on-site and in-process.

In January 2017, we released the FARO Vantage^{S} and Vantage^{E} Laser Trackers. The Vantage^{S} is intended for short-to-long range measurement applications of up to 80 meters, while the Vantage^{E} supports short-to-medium range applications of up to 25 meters.

- ***Laser Tracker ION*** – The FARO Laser Tracker ION is an interferometer (IFM)-based measurement system that provides the high accuracy and range to complete measurement tasks, such as in-line measurements, high-speed dynamic measurements, or high-accuracy machine calibration.
- ***6DoF FARO Vantage Laser Tracker*** – Together with the hand-held 6Probe, a fully-integrated hand-held probe, the 6DoF FARO Vantage Laser Tracker expands the capabilities of large volume measurement by allowing users to access hidden, hard-to-reach locations by probing and scanning.
- ***Computer*** – The FARO Laser Tracker™ includes a notebook or desktop-style computer, depending on the customer's requirements, that includes the pre-installed CAM2® Software.

FARO Cobalt Array Imager. The FARO Cobalt Array Imager is a metrology-grade structured light imager that utilizes blue light technology to capture millions of high resolution 3D coordinate measurements in seconds. FARO Cobalt's versatility supports a variety of deployment options including rotary table, robot, industrial inspection cells and multiple imager arrays. This technology is used in quality control to improve product quality and reduce scrap, as well as for reverse engineering and rapid manufacturing. This product is primarily sold in the 3D Manufacturing vertical.

FARO Laser Projector. The FARO Tracer^{M} and Tracer^{SI} accurately project a laser line onto a surface or object, providing a virtual template that operators and assemblers can use to quickly and accurately position components with confidence. The laser template is created using a 3D CAD model that enables the system to visually project a laser outline of parts, reference points, or areas of interest. The result is a virtual and collaborative 3D template to streamline a wide range of assembly and production applications. This product is primarily sold in the 3D Manufacturing vertical.

FARO Focus. The FARO Focus laser scanner utilizes laser technology to measure and collect a cloud of data points, allowing for the detailed and precise 3D rendering of an object or an area as large as an industrial facility. This technology is currently used for factory planning, facility life-cycle management, quality control, forensic analysis and capturing large volumes of 3D data. The FARO Focus simplifies modeling, reduces project time and maintains or increases the detail, identifies the colors and measures the dimensions of surrounding structures. The resulting data is used with major CAD systems or FARO's own proprietary FARO SCENE, As-Built™, BuildIT, and FARO Zone. This product is primarily sold in the Construction BIM and Public Safety Forensics verticals.

FARO Scanner Freestyle^{3D} X. The FARO Scanner Freestyle^{3D} X is a handheld scanner that quickly documents rooms, structures and objects in 3D and creates high-definition point clouds. The applications of the FARO Scanner Freestyle^{3D} X include architecture, construction, industrial production and forensics. The FARO Scanner Freestyle^{3D} X's

durable carbon fiber design equips the user with a versatile and ergonomic tool for performing accurate scanning in confined spaces. The FARO Scanner Freestyle^{3D} X can be used independently or as a complement to the FARO Focus. The FARO Scanner Freestyle^{3D} X comes with two software applications in addition to FARO's proprietary SCENE software: SCENE Capture, which is installed on a tablet computer to record and visualize the capturing of 3D data, and SCENE Process, which processes the captured 3D data. This product is primarily sold in the Construction BIM and Public Safety Forensics verticals.

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FARO ScanPlan. The FARO ScanPlan is a handheld mapper that captures 2D floor plans. The FARO ScanPlan performs real-time capturing and diagramming of as-built floor plans of buildings for threat assessment, pre-incident planning and fire protection engineering. The FARO ScanPlan comes with FARO Zone 2D software to turn any floor plan map into a completed diagram by adding doors, stairs, hazardous materials, notes and dimensions, among others. This product is primarily sold in the Public Safety Forensics vertical.

FARO Digi-Cube®. FARO Digi-Cube® is a high-precision, high scan rate, digital auto-controlled scan head that is easily integrated into a variety of laser scanning products. This product is used for exacting applications such as high accuracy laser marking, scribing and engraving, laser 3D printing, photovoltaic production and welding. This product is primarily sold in the Photonics vertical.

FARO Software. We provide a family of proprietary CAD-based measurement and laser scanner software used with our measurement and scanning devices.

- **CAM2® 2018** allows customers to complete measurement jobs quickly and gives customers the freedom to measure as required by the application.
- **CAM2 SmartInspect** is our CAM2 solution for measuring geometry and building dimensions. The software allows customers to quickly measure geometric features and report dimensions for control.
- **BuildIT** is a CAD-to-part inspection software that enables quick and easy dimensional verification of manufactured parts and assemblies for tool building, assembly, alignment, process automation, reverse engineering and quality control. BuildIT's advanced analysis and reporting capabilities combine measurement data from multiple sources to produce detailed graphical and textual reports that are used to quickly identify manufacturing and production trends. With both numerical and graphical feedback of real-time deviations, BuildIT allows users to position parts with micrometer accuracy for high-precision assembly and alignment applications.
- **FARO SCENE** software combines ease-of-use, networking, and an enhanced 3D experience to deliver a complete scan processing solution. With SCENE, customers can display, analyze, administer and edit 3D measurements in point clouds.
- **FARO Zone** software makes diagramming and pre-planning easier for law enforcement officers, firefighters and loss control engineers by allowing the users who need to draw site plans or crash or crime scene diagrams to be able to do so in a fast and efficient manner.
- **FARO As-Built™** software products enable and simplify the use of real world objects in CAD applications. Primarily serving the surveying and architecture, engineering and construction spaces, the offering allows the user to integrate 3D laser scan data with CAD environments.

Warranties and Services. We warrant our products against defects in design, materials and workmanship for one year. To support our product lines, we also separately sell extended warranties that typically range from less than one year to three years and comprehensive support, training and technology consulting services to our customers.

Customers

Our sales are diversified across a broad number of over 15,000 customers worldwide in our 3D Manufacturing, Construction BIM, 3D Design, Public Safety Forensics and Photonics vertical markets. Our ten largest customers by revenue represented an aggregate of approximately 2.2% of our total sales in 2018. No customer represented more than 1.0% of our sales in 2018.

Sales and Marketing

We conduct our sales and marketing efforts on a vertical basis. Each vertical has its own sales and marketing team coordinated by our Lake Mary headquarters. Geographically, we have operations in three main regions around the world: Americas, Europe/Middle East/Africa ("EMEA") and Asia-Pacific. The regional headquarters for the Americas, which is also our global headquarters, is located in Lake Mary, Florida; the EMEA regional headquarters is located in Stuttgart, Germany; and the regional headquarters for the Asia-Pacific region is located in Singapore. Each of these regional sales and marketing organizations support each of our reporting segments. As of December 31, 2018, we employed 808 sales and marketing specialists globally.

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We sell most of our products through direct sales representation in Australia, Brazil, Canada, China, France, Germany, India, Italy, Japan, Malaysia, Mexico, the Netherlands, Poland, Portugal, Singapore, South Korea, Spain, Sweden, Switzerland, Thailand, Turkey, the United Kingdom, and the United States. Our sales and marketing efforts use a process of integrated lead qualification and sales demonstration. Once a customer opportunity is identified, we employ a team-based sales approach involving inside and outside sales personnel. Each team has the ability to sell multiple product lines. We employ a variety of marketing techniques to promote brand awareness and customer identification.

Research and Development

We believe that our future success depends, in part, on our ability to maintain what we believe to be our technological leadership, which will require ongoing enhancements of our products and the development of new applications and products that provide 3D measurement and imaging solutions. The field of 3D measurement and imaging continues to expand, and new technologies and applications will be essential to competing in this market. Accordingly, we intend to continue to make substantial investments in the development of new technologies, the commercialization of new products that build on our existing technological base, and the enhancement and development of additional applications for our products.

Our research and development efforts are directed primarily at enhancing the functional adaptability of our current products and developing new and innovative products that respond to specific requirements of the emerging market for 3D measurement and imaging solutions. Additionally, certain of our acquisitions are intended, in whole or in part, to further the development of technologies which, on a risk adjusted basis, are better to be acquired than developed internally by us. Research and development activities, especially with respect to new products and technologies, are subject to significant risks, and there can be no assurance that any of our research and development activities will be completed successfully or on schedule, or, if completed, will be commercially accepted.

At December 31, 2018, we employed 260 scientists and technicians in our research and development efforts. Research and development expenses were approximately $39.7 million in 2018, compared to $35.4 million in 2017 and $30.1 million in 2016.

Intellectual Property

We own approximately 960 patents and pending patent applications worldwide, which generally expire on a rolling basis between 2019 and 2042. We also own approximately 74 trademark registrations worldwide, with 2 pending trademark applications.

Our success and ability to maintain a competitive position depends, in large part, on our ability to protect our intellectual property. We rely on a combination of contractual provisions and trade secret laws to protect our proprietary information. However, there can be no assurance that the steps taken by us to protect our trade secrets and proprietary information will be sufficient to prevent misappropriation of our proprietary information or preclude third-party development of similar intellectual property.

Despite our efforts to protect our proprietary rights, unauthorized parties may attempt to copy aspects of our products or to obtain and use information that we regard as proprietary. We intend to vigorously defend our proprietary rights against infringement by third parties. However, policing unauthorized use of our products is difficult, particularly in foreign countries, and we may be unable to determine the extent, if any, to which unauthorized uses of our products exist. In addition, the laws of some foreign countries do not protect our proprietary rights to the same extent as the laws of the United States.

We do not believe that any of our products infringe on the valid, proprietary rights of third parties. There can be no assurance, however, that third parties will not claim infringement by us with respect to current or future products. Such claims, with or without merit, could be time consuming, result in costly litigation, cause product shipment delays or require us to enter into royalty or licensing agreements, which could have a material adverse effect upon our business, operating results and financial condition. In addition, such royalty or licensing agreements, if required, may not be available on terms acceptable to us, if at all.

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Manufacturing and Assembly

Manufacturing consists primarily of assembling and integrating components and subassemblies purchased from suppliers into finished products. The primary components, which include machined parts and electronic circuit boards, are produced by subcontractors according to our specifications. Products are assembled, calibrated and tested for accuracy and functionality before shipment. We perform limited in-house circuit board assembly and component part machining. Typically, we enter into purchase commitments for manufacturing components to cover production requirements for 60 to 120 days. We have entered, and may continue to enter, into longer agreements to purchase sufficient inventory to satisfy warranty commitments or to ensure adequate component availability.

Our manufacturing, engineering, and design headquarters have been registered to the ISO 9001 standard since July 1998. Semi-annual surveillance audits have documented continuous improvement to this multinational standard. Currently, our manufacturing sites in Lake Mary, Florida; Exton, Pennsylvania; Stuttgart, Germany; Schaffhausen, Switzerland; and Singapore are jointly registered to ISO 9001. Our FARO Laser Tracker™, FaroArm®, and FARO Cobalt Array Imager products are all registered to ISO 17025:2005. We continue to examine our scope of registration as our business evolves, and we have chosen English as the standard business language for our operations.

Our efforts to register our manufacturing, engineering and design headquarters to the ISO 9001 standard in concert with the ISO 9001:2015 Quality Management System Certification verifies our commitment to quality through an internationally recognized standard. Additionally, we take a global approach to ISO 17025:2005 regarding the recognition of the Competence of Calibration and Testing Laboratories, seeking to have all locations registered with similar scopes of accreditation and capabilities for the products generated and serviced.

We manufacture our FaroArm® and FARO ScanArm® products in our manufacturing facility located in Switzerland for customer orders from EMEA, in our manufacturing facility located in Singapore for customer orders from the Asia-Pacific region, and in our manufacturing facility located in Florida for customer orders from the Americas. We manufacture our FARO Focus in our manufacturing facilities located in Germany and Switzerland for customer orders from EMEA and the Asia-Pacific region, and in our manufacturing facility located in Pennsylvania for customer orders from the Americas. We manufacture our FARO Freestyle^{3D} X products in our facility located in Germany. We manufacture our FARO Laser Tracker™ and our FARO Laser Projector products in our facility located in Pennsylvania. We manufacture our 3D structured light scanning solutions specific to the dental industry in our engineering and manufacturing facility in Italy. We expect all of our existing manufacturing facilities to have the production capacity necessary to support our volume requirements during 2019.

Competition

Our measurement systems compete in the broad and highly competitive market for measurement devices for manufacturing and industrial applications, which, in addition to portable articulated arms, laser trackers, 3D imaging and laser scanner products, consist of fixed-base CMMs, templates and go/no-go gages, check fixtures, handheld measurement tools, and various categories of surveying equipment. In the FaroArm®, FARO ScanArm®, FARO Laser Tracker™, and FARO Focus product lines, we compete primarily with Hexagon Manufacturing Intelligence, a division of Hexagon AB; Automated Precision Inc.; Artec Europe, S.a.r.l.; Leica Geosystems, Inc., a division of Hexagon AB; and Trimble Inc. In the FARO Cobalt Array Imager product lines, we compete primarily with Carl Zeiss Optotechnik GmbH, GOM GmbH, Hexagon Manufacturing Intelligence, and Nikon Metrology, Inc., a division of Nikon Inc. In the FARO Laser Projector product line, we compete primarily with ViRTEK, a division of Gerber Technology LLC. We also compete in these product lines with a number of other smaller companies. We compete on the basis of technical innovation, product performance, quality and price with respect to all of our products.

We will be required to make continued investments in technology and product development to maintain and extend the technological advantage that we believe we currently have over our competition. However, we cannot be certain that our technology or our product development efforts will allow us to successfully compete as the industry evolves. As the market for our measurement systems expands, additional competition may emerge, and our existing and future competitors may commit more resources to the markets in which we participate.

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Government Regulation

Our operations are subject to numerous governmental laws and regulations, including those governing antitrust and competition, the environment, collection, recycling, treatment and disposal of covered electronic products and components, import and export of products, currency conversions and repatriation, taxation of foreign earnings, and the use of local employees and suppliers. Our foreign operations are subject to the U.S. Foreign Corrupt Practices Act, or FCPA, and similar foreign anti-corruption laws, which makes illegal any payments to government officials or government employees that are intended to induce their influence to assist us or to gain any improper advantage for us. We operate in certain regions in the Middle East, Africa, Latin America and Asia-Pacific that are more prone to risk under these anti-corruption laws.

Manufacturers of electrical goods are subject to the European Union's RoHS2 and WEEE directives, which took effect during 2006. RoHS2 prohibits the use of lead, mercury and certain other specified substances in electronics products, and WEEE makes producers of electrical goods financially responsible for specified collection, recycling, treatment, and disposal of covered electronic products and components. Parallel initiatives are being proposed in other jurisdictions, including several states in the United States and China. We currently hold RoHS2 and WEEE registration and are in compliance with such directives of the European Union.

In addition, a number of data protection laws impact, or may impact, the manner in which we collect, process and transfer personal data. Most notably, the European Union's General Data Protection Regulation ("GDPR"), which went into effect in May 2018, expands data protection compliance obligations and authorizes significantly increased fines for noncompliance, requiring additional compliance resources and efforts on our part. Further, a number of other regions where we do business, including the United States, Asia-Pacific and Latin America, have enacted or are considering new data protection regulations that may impact our business activities that involve the processing of personal data. Compliance with enhanced data protection laws requires additional resources and efforts, and noncompliance with personal data protection regulations could result in increased regulatory enforcement and significant monetary fines and costs.

We currently sell our products and related services to the U.S. Government (the "Government") under two General Services Administration ("GSA") Federal Supply Schedule contracts (the "GSA Contracts"). The Government, as well as state and local governments, can typically terminate or modify their contracts with us either at their discretion or if we default by failing to perform under the terms of the applicable contract, which could expose us to liability and impede our ability to compete in the future for contracts and orders. Our sales to the Government under the GSA Contracts represented approximately 3.5% of our total sales for 2018.

Certain of our products are classified as medical devices and are subject to restrictions under domestic and foreign laws, rules, regulations, self-regulatory codes, circulars and orders, including, but not limited to, the United States Food, Drug, and Cosmetic Act (the "FDCA"), Council Directive 93/42/EEC on Medical Devices ("MDD") (1993) in the European Union (and implementing and local measures adopted thereunder) and similar international laws and regulations. The FDCA requires these products, when sold in the United States, to be safe and effective for their intended use and to comply with the regulations administered by the United States Food and Drug Administration ("FDA"). Certain medical device products are also regulated by comparable agencies in non-U.S. countries in which they are produced or sold.

Backlog and Seasonality

At December 31, 2018, we had orders representing approximately $17.5 million in sales outstanding, of which $8.3 million related to services that we expect to deliver within one year. The product-related outstanding orders as of December 31, 2018 were $9.2 million, of which $3.0 million were shipped by February 15, 2019. As of February 15, 2019, we had orders representing approximately $17.1 million in sales outstanding, inclusive of 2018 open and undelivered orders, of which $7.7 million related to service orders and $9.4 million were product-related orders. We believe that substantially all of the outstanding product-related orders as of February 15, 2019 will be shipped during 2019. At December 31, 2017 and 2016, we had orders representing approximately $18.0 million and $13.4 million in sales outstanding, respectively.

We typically experience greater order volume during the fourth quarter as customers spend the remaining balances of their capital expenditure budgets.

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Employees

At December 31, 2018, we had 1,862 full-time employees, consisting of 808 sales and marketing professionals, 305 customer service/training/application engineering specialists, 273 production staff, 260 research and development staff, and 216 administrative staff. We are not a party to any collective bargaining agreements and believe our employee relations are satisfactory. Management believes that our future growth and success will depend in part on our ability to retain and continue to attract highly-skilled personnel. We anticipate that we will be able to obtain the additional personnel required to satisfy our staffing requirements during 2019.

Available Information

We make available, free of charge on our Internet website at http://www.faro.com, our Annual Report on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K, and any amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Exchange Act as soon as reasonably practicable after they are electronically filed with, or furnished to, the Securities and Exchange Commission, or the SEC. You can find these reports on our website at www.faro.com by first clicking “Investor Relations” and then “SEC Filings.” The information on, or accessible through, our website is not a part of this Annual Report on Form 10-K. You may also access this information at the SEC’s website at http://www.sec.gov. This site contains reports, proxy and information statements and other information regarding issuers that file electronically with the SEC.

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ITEM 1A. RISK FACTORS

The statements under this heading describe the most significant risks to our business identified by management and should be considered carefully in conjunction with the discussion in Management's Discussion and Analysis of Financial Condition and Results of Operations included in Part II, Item 7 of this Annual Report on Form 10-K and in our Consolidated Financial Statements and notes thereto included in Part II, Item 8 of this Annual Report on Form 10-K before deciding to invest in, or retain, shares of our common stock.

Any of the following risks and uncertainties could materially and adversely affect our business, results of operations, liquidity, and financial condition. These are not the only risks we face. Our operations could also be affected by additional factors that are not presently known by us or by factors that we currently do not consider to be material to our business.

Competitors may develop products that make our products obsolete or less competitive.

The 3D measurement and imaging solutions market is characterized by rapid technological change. Competitors may develop new or improved products, processes or technologies that may make our products obsolete or less competitive.

As a result, our success depends, in part, on our ability to maintain our technological advantage by developing new products and applications and enhancing our existing products, which can be complex and time-consuming and require substantial investment. Significant delays in new product releases or difficulties in developing new products could adversely affect our business and results of operations. We can provide no assurance that we will be able to adapt to evolving markets and technologies or maintain our technological advantage.

Our financial performance is dependent on the conditions of various industries, including the automotive, aerospace, and heavy equipment industries, which have from time to time experienced, and may again experience, significant disruptions in the economic environment.

A significant portion of our sales are to manufacturers in the automotive, aerospace, and heavy equipment industries. We are dependent upon the continued viability and financial stability of our customers in these industries, which are highly cyclical and dependent upon the general health of the economy and consumer spending.

Because a significant portion of our revenues and expenses are denominated in foreign currencies, we face significant exposure to foreign exchange rate risk.

Our results of operations are affected by fluctuations in exchange rates, which have caused, and may in the future cause, significant fluctuations in our quarterly and annual results of operations. Fluctuations in exchange rates may have a material adverse effect on our results of operations and financial condition and could result in potentially significant foreign exchange gains and losses. To the extent that the percentage of our non-U.S. dollar revenues derived from international sales increases in the future, our exposure to risks associated with fluctuations in foreign exchange rates will increase.

Product failures or product availability and performance issues could result in increased warranty costs and delays in new product introductions and enhancements, and could adversely affect our business and financial condition.

We regularly introduce new products and enhance existing products. The impact of new product introductions, including the costs associated with new product introductions, such as product development, marketing, assembly line start-up costs and low introductory period production volumes, and manufacturing inefficiencies associated with new product introductions could have an adverse effect on our business and financial condition. Failures in, or performance issues impacting, our new or existing products could result in increased warranty costs, delays in new product introductions or existing product enhancements, and a loss of sales and customers, which would have an adverse effect on our business and financial condition. The supply of raw materials for a new or existing product could be delayed or constrained, or a key vendor could delay shipments, which may decrease product availability, causing a loss of sales and customers.

Our growth depends on the ability of our products to attain broad market acceptance.

The market for traditional fixed-base CMMs, check fixtures, handheld measurement tools, and surveying equipment is mature. Part of our strategy is to continue to displace these traditional measurement devices. Displacing traditional measurement devices and achieving broad market acceptance for our products requires significant effort to convince

customers to reevaluate their historical measurement procedures and methodologies.

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The potential size and growth rate of the CAM2 market is uncertain and difficult to quantify. If the CAM2 market does not continue to expand or does not expand as quickly as we anticipate, we may not be able to grow our sales, which could materially adversely affect our results of operations and financial condition.

We market nine closely interdependent products (FaroArm®, FARO ScanArm®, FARO Laser Tracker™, FARO Laser Projector, FARO Cobalt Array Imager, FARO Focus, FARO Scanner Freestyle^{3D} X, FARO ScanPlan and FARO Digi-Cube®) and related software for use in measurement, inspection, and high density surveying applications. Substantially all of our revenues are currently derived from sales of these products and software, and we plan to continue our business strategy of focusing on the software-driven, 3D measurement and imaging solutions market. Consequently, our financial performance will depend, in large part, on computer-based measurement, inspection and high density surveying products achieving broad market acceptance. If our products cannot attain broad market acceptance, we will not grow as anticipated and may be required to make increased expenditures on research and development for new applications or new products.

Increases in the cost of raw materials or components used in our products could negatively impact our business and profitability.

Our products contain various raw materials, including steel, steel byproducts, aluminum and aluminum byproducts. We use raw materials directly in manufacturing and in components that we purchase from our suppliers. These raw materials are subject to extensive laws, governmental regulations and policies, including tariffs and other import restrictions. Changes to the laws, governmental regulations and policies governing these raw materials, including tariffs and other import restrictions, could significantly increase the cost of such raw materials and, correspondingly, the cost of manufacturing our products. If the costs of our raw materials increase, whether due to changes in laws, governmental regulations or policies or for other reasons, we may not be able to pass on these costs to our customers, which could have a material adverse effect on our business, results of operations and financial condition. Even in the event that increased costs can be passed through to our customers, our gross margin percentages would decline. Additionally, our suppliers are also subject to fluctuations in the prices of raw materials and may attempt to pass all or a portion of such increases on to us. In the event they are successful in doing so, our margins would decline.

Changes in tariffs and other export regulations could increase the cost of our products sold to our international customers, which could negatively impact our sales and profitability.

Our international sales operations are subject to extensive laws, governmental regulations and policies, including but not limited to tariffs and other export regulations. Changes in export regulations could increase the cost of our products sold as exports to our international customers. If our international customers are not willing to absorb the incremental costs resulting from those tariffs or other export regulations, it could negatively impact our sales to such customers, as well as our profitability.

We may not be able to identify or consummate acquisitions or achieve expected benefits from or effectively integrate acquisitions, which could harm our growth.

Our growth strategy partly depends on our ability to obtain additional technologies, complementary product lines and sales channels through selective acquisitions and strategic investments. We may not be able to identify and successfully negotiate suitable acquisitions, obtain financing for future acquisitions, if necessary, on satisfactory terms or otherwise complete acquisitions in the future. In the past, we have used our stock as consideration for acquisitions. Our common stock may not remain at a price at which it can be used as consideration for acquisitions without diluting our existing shareholders, and potential acquisition candidates may not view our stock attractively.

In addition, realization of the benefits of acquisitions often requires integration of some or all of the sales and marketing, distribution, manufacturing, engineering, software development, customer service, finance and administrative organizations of the acquired companies. The integration of acquisitions demands substantial attention from senior management and the management of the acquired companies. Our recent acquisitions are, and any future acquisitions may be, subject to a variety of risks and uncertainties including:

- the inability to assimilate effectively the operations, products, technologies and personnel of the acquired companies (some of which may be located in diverse geographic regions);
- the inability to maintain uniform standards, controls, procedures and policies;

- the need or obligation to divest portions of the acquired companies; and
- the potential impairment of relationships with customers.

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We cannot offer any assurance that we will be able to identify, complete or successfully integrate any suitable acquisitions, that any acquired companies will operate profitably, or that we will realize the expected synergies and other benefits from any acquisition.

The buying process for most of our customers for our measurement products is highly decentralized and typically requires significant time and expense for us to further penetrate the potential market of a specific customer, which may delay our ability to generate additional revenue.

Our success depends, in part, on our ability to further penetrate our customer base. During 2018, approximately 79% of our revenue was attributable to sales to our existing customers. If we are not able to continue to further penetrate our existing customer base, our future sales may decline. However, most of our customers have a decentralized buying process for measurement devices, and we must spend significant time and resources to increase revenues from a specific customer. For example, we may provide products to only one of our customer's manufacturing facilities or for a specific product line within a manufacturing facility. We cannot offer any assurance that we will be able to maintain or increase the amount of sales to our existing customers, which could adversely affect our financial results.

Our failure to successfully execute our Chief Executive Officer transition or to attract and retain qualified personnel could lead to a loss of sales or decreased profitability.

The loss of any of our current executive officers, or other key personnel, could adversely affect our sales, profitability or growth. Moreover, we continue to rely, in part, on equity awards to attract and retain qualified personnel, which may result in an increase in compensation expense.

On January 10, 2019, we announced that Dr. Simon Raab plans to retire as our President and Chief Executive Officer and as a member of our Board of Directors, effective upon the appointment of his successor. Our Board of Directors has commenced a search process to identify his successor. If we encounter difficulties in this transition, such difficulties could adversely impact sales, profitability and other financial results.

Any failure to protect our patents and proprietary rights in the United States and foreign countries could adversely affect our revenues.

Our success depends, in large part, on our ability to obtain and maintain patents and other proprietary rights protection for our processes and products in the United States and other countries. We also rely upon trade secrets, technical know-how and continuing inventions to maintain our competitive position. We seek to protect our technology and trade secrets, in part, by confidentiality agreements with our employees and contractors. However, our employees may breach these agreements, or our trade secrets may otherwise become known or be independently discovered by inventors. If we are unable to obtain or maintain protection of our patents, trade secrets and other proprietary rights, we may not be able to prevent third parties from using our proprietary rights, which could have a material adverse effect on our results of operations.

Our patent protection involves complex legal and technical questions. Our patents may be challenged, narrowed, invalidated or circumvented. Further, we may be able to protect our proprietary rights from infringement by third parties only to the extent that our proprietary processes and products are covered by valid and enforceable patents or are effectively maintained as trade secrets. Furthermore, others may independently develop similar or alternative technologies or design around our patented technologies. Litigation or other proceedings to defend or enforce our intellectual property rights could require us to spend significant time and money, which could have an adverse impact on our financial condition.

Claims from others that we infringed on their intellectual property rights may adversely affect our business and financial condition.

From time to time, we receive notices from others claiming that we infringed on their intellectual property rights. Resolving these claims may require us to enter into royalty or licensing agreements on unfavorable terms, require us to stop selling or to redesign affected products, or require us to pay damages. In addition, from time to time, we are involved in intellectual property lawsuits. We could, in the future, incur judgments or enter into settlements of lawsuits and claims that could have a material adverse effect on our financial condition. Any litigation or interference proceedings, regardless of their outcome, may be costly and may require significant time and attention of our management and technical personnel.

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We may not be able to achieve financial results within our target goals, and our operating results may fluctuate due to a number of factors, many of which are beyond our control.

Our ability to achieve financial results that are within our goals is subject to a number of factors beyond our control. Moreover, our annual and quarterly operating results have varied significantly in the past and likely will vary significantly in the future. Factors that cause our financial results to fluctuate include, but are not limited to, the following:

- adverse changes in the manufacturing industry and general economic conditions;
- the effectiveness of sales promotions;
- geographic expansion in our regions;
- training and ramp-up time for new sales people;
- investments in strategic sales, product or other initiatives;
- investments in technologies and new products and product enhancements, including costs associated with new development and product introductions, and the timing and market acceptance of new products and product enhancements;
- manufacturing inefficiencies related to new product introductions;
- excess or obsolete inventory, shrinkage or other inventory losses due to product obsolescence, change in demand for our products, scrap or material price changes;
- expansion of our manufacturing capability;
- the size and timing of customer orders, many of which are received towards the end of a quarter;
- the amount of time that it takes to fulfill orders and ship our products;
- the length of our sales cycle to new customers;
- customer order deferrals in anticipation of new products and product enhancements;
- start-up costs and ramp-up time associated with opening new sales offices outside of the United States;
- variations in our effective income tax rate and difficulty in predicting our effective tax rate on a quarterly and annual basis; and
- litigation and regulatory action brought against us.

Any one or a combination of these factors could adversely affect our annual and quarterly operating results in the future and could cause us to fail to achieve our target financial results.

We compete with manufacturers of measurement systems and traditional measurement devices, many of which have more resources than us and may develop new products and technologies.

Our measurement systems compete in the broad and highly competitive market for measurement devices for manufacturing and industrial applications, which, in addition to portable articulated arms, laser trackers, 3D imaging and laser scanner products, consist of fixed-base CMMs, templates and go/no-go gages, check fixtures, handheld measurement tools, and various categories of surveying equipment. In the FaroArm®, FARO ScanArm®, FARO Laser Tracker™, and FARO Focus product lines, we compete primarily with Hexagon Manufacturing Intelligence, a division of Hexagon AB; Automated Precision Inc.; Artec Europe, S.a.r.l.; Leica Geosystems, Inc., a division of Hexagon AB; and Trimble Inc. In the FARO Cobalt Array Imager product lines, we compete primarily with Carl Zeiss Optotechnik GmbH, GOM GmbH, Hexagon Manufacturing Intelligence, and Nikon Metrology, Inc., a division of Nikon Inc. In the FARO Laser Projector product line, we compete primarily with ViRTEK, a division of Gerber Technology LLC. We also compete in these product lines with a number of other smaller companies. We compete on the basis of technical innovation, product performance, quality and price with respect to all of our products.

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We will be required to make continued investments in technology and product development to maintain the technological advantage that we believe we currently have over our competition. Some of our competitors possess substantially greater financial, technical, and marketing resources than we possess. Moreover, we cannot be certain that our technology or our product development efforts will allow us to successfully compete as the industry evolves. As the market for our measurement systems expands, additional competition may emerge and our existing and future competitors may commit more resources to the markets in which we participate. Our results of operations could be adversely affected by pricing strategies pursued by competitors or technological or product developments by competitors.

If we fail to establish and maintain effective internal controls over financial reporting, our financial statements could contain a material misstatement, which could adversely affect our business and financial condition.

Under Section 404 of the Sarbanes-Oxley Act of 2002 and the rules promulgated by the SEC, companies are required to conduct a comprehensive evaluation of their internal controls over financial reporting. As part of this process, we are required to document and test our internal controls over financial reporting, management is required to assess and issue a report concerning our internal controls over financial reporting, and our independent registered public accounting firm is required to attest to the effectiveness of our internal controls over financial reporting. Our internal controls over financial reporting may not prevent or detect misstatements because of their inherent limitations, including the possibility of human error, the circumvention or overriding of controls, or fraud. Over time, controls may become inadequate because of changes in conditions or deterioration in the degree of compliance with policies or procedures. Because of the inherent limitations in a cost-effective control system, misstatements due to error or fraud may occur and may not be prevented or detected on a timely basis. Even effective internal controls over financial reporting can provide only reasonable assurance with respect to the preparation and fair presentation of financial statements. If we fail to adequately establish and maintain effective internal controls over financial reporting, our financial statements may contain material misstatements, and we could be required to restate our financial results. This could cause us to fail to meet our reporting obligations, lead to a loss of investor confidence and adversely affect our business, our financial condition, and the trading price of our common stock.

We derive a substantial part of our revenues from our international operations, which are subject to greater volatility and often require more management time and expense to achieve profitability than our domestic operations.

We derive more than half of our revenues from international operations. Our international operations are subject to various risks, including:

- difficulties in staffing and managing foreign operations;
- political and economic instability;
- unexpected changes in regulatory requirements and laws;
- longer customer payment cycles and difficulty collecting accounts receivable;
- compliance with export and import regulations, including tariffs, and trade restrictions;
- governmental restrictions on the transfer of funds to us from our operations outside the United States; and
- burdens of complying with a wide variety of foreign laws and labor practices.

Several of the countries where we operate have emerging or developing economies, which may be subject to greater currency volatility, negative growth, high inflation, limited availability of foreign exchange and other risks. These factors may harm our results of operations and any measures that we may implement to reduce the effect of volatile currencies and other risks of our international operations may not be effective.

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Our financial results may be adversely affected by exposure to additional tax liabilities.

As a multinational corporation, we are subject to income tax in the United States and numerous foreign jurisdictions. Our effective tax rate is directly impacted by the application of complex tax laws and regulations and is highly dependent upon the geographic mix of our worldwide earnings or losses, the tax regulations in each country or geographic region in which we operate, and the availability of tax credits and loss carry-forwards. Our provision for income taxes and tax liability in the future could be adversely affected by many factors including, but not limited to, income before taxes being lower than anticipated in countries with lower statutory tax rates and higher than anticipated in countries with higher statutory tax rates, changes in the valuation of deferred tax assets and liabilities, and changes in tax laws, regulations, accounting principles or interpretation of accounting principles. Application of tax laws and regulations is also subject to legal and factual interpretation, judgment, and uncertainty. Further, tax laws are subject to change as a result of changes in fiscal policy and legislation and the evolution of regulations and court rulings.

The income and non-income tax regimes we are subject to or operate under may be subject to significant change. Changes in tax laws or tax rulings, or changes in interpretations of existing laws, could materially affect our financial position and results of operations. Certain countries in Europe, as well as a number of other countries and organizations, have recently proposed or recommended changes to existing tax laws that could significantly increase our tax obligations in many countries where we do business or require us to change the manner in which we operate our business. The Organization for Economic Cooperation and Development ("OECD") has continued to work on a Base Erosion and Profit Sharing ("BEPS") initiative. In 2015, the OECD issued initial guidelines and proposals that may change various aspects of the existing framework under which our tax obligations are determined in many of the countries in which we do business. As BEPS guidance is further released, legislative changes may result that could potentially impact the recorded amounts of our deferred tax assets, deferred tax liabilities and our effective tax rate. The European Commission has conducted investigations in multiple countries focusing on whether local country tax rulings or tax legislation provides preferential tax treatment that violates European Union state aid rules and concluded that certain countries, including Ireland, have provided illegal state aid in certain cases. These investigations may result in changes to the tax treatment of our foreign operations.

Implementation of the United Kingdom's ("UK") exit from European Union membership could adversely impact our business.

On June 23, 2016, the UK held a referendum in which voters approved an exit from the European Union. On March 29, 2017, the UK invoked Article 50 of the Treaty on European Union, which triggered a two-year period, subject to extension by unanimous consent of all European Union member states, during which the UK government would negotiate its withdrawal agreement with the European Union. On November 25, 2018, the leaders of the 27 European Union member states, excluding the UK, endorsed the draft withdrawal agreement and approved the political declaration setting out the framework for the future relationship between the European Union and the UK. However, on January 15, 2019, this proposed withdrawal agreement was rejected by the UK Parliament. Negotiations between the UK and the European Union are continuing. Even if no withdrawal agreement is agreed to and ratified prior to March 29, 2019, by the automatic operation of law, the UK would nevertheless exit the European Union on March 29, 2019 ("No Deal Brexit") unless, prior to the exit day, each European Union member state and the UK unanimously agree to extend Article 50, or the UK unilaterally withdraws its Article 50 notification.

Although it is unknown what the terms of the UK's future relationship with the European Union will be after the UK's exit from European Union membership, it is possible that there will be greater restrictions on, and costs associated with, imports and exports between the UK and European Union member states, including, without limitation, the imposition of tariffs and increased regulatory complexities. The hiring and retention of skilled labor may also become more challenging if the free movement of workers between the European Union and the UK ends. We may also be impacted by exchange rate volatility prior to and after the exit date. Any of these factors could adversely affect our business and operating results by adversely affecting customer demand and our relationships with customers in the UK and the European Union. In addition, in the event of a No Deal Brexit, our business and operating results, our customer demand and our relationships with customers in the UK and the European Union may be adversely impacted by any subsequent macroeconomic uncertainty or downturn in the UK economy, any resulting exchange rate volatility

and any tariffs and enhanced customs checks imposed on us.

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Reductions in defense spending could adversely affect our business.

Certain of our customers operate in the defense sector and depend significantly on U.S. government spending. In August 2011, Congress enacted the Budget Control Act of 2011, which imposed spending caps and certain reductions in defense spending through 2021. Automatic spending reductions, referred to as sequestration, were implemented in March 2013. Ongoing budgetary discussions in the federal government may result in other cuts to defense spending. Reductions in defense spending that impact the aerospace and defense industries, or uncertainty regarding future levels of government expenditures, could have an adverse effect on our results of operations. Additionally, if Congress is unable to pass appropriations bills in a timely manner, a government shutdown could result, which may have impacts in addition to those resulting from budget cuts, sequestration impacts or program-level appropriations, including payment delays, impairment of our ability to perform work on existing contracts and reductions in future orders.

We are subject to the impact of governmental and other similar certification processes and regulations, which could adversely affect our business and results of operations.

Our operations are subject to numerous governmental laws and regulations, including those governing antitrust and competition, the environment, collection, recycling, treatment and disposal of covered electronic products and components, import and export of products, currency conversions and repatriation, taxation of foreign earnings and use of local employees and suppliers. An inability to comply with these regulations or obtain any necessary certifications in a timely manner could have an adverse effect on our business and results of operations.

Manufacturers of electrical goods are subject to the European Union's RoHS2 and WEEE directives, which took effect during 2006. RoHS2 prohibits the use of lead, mercury and certain other specified substances in electronics products, and WEEE makes producers of electrical goods financially responsible for specified collection, recycling, treatment, and disposal of covered electronic products and components. While we currently hold WEEE registration and are in compliance with the directives of the European Union, including the RoHS2 directive, parallel initiatives are being proposed in other jurisdictions, including several states in the United States and China. If we do not comply with any such initiatives, our sales and results of operations could be materially impacted.

In addition, a number of data protection laws impact, or may impact, the manner in which we collect, process and transfer personal data. Most notably, the GDPR, which went into effect in May 2018, expands data protection compliance obligations and authorizes significantly increased fines for noncompliance, requiring additional compliance resources and efforts on our part. Further, a number of other regions where we do business, including the United States, Asia-Pacific and Latin America, have enacted or are considering new data protection regulations that may impact our business activities that involve the processing of personal data. Compliance with enhanced data protection laws requires additional resources and efforts, and noncompliance with personal data protection regulations could result in increased regulatory enforcement and significant monetary fines and costs, which could have an adverse effect on our business, results of operations and financial condition.

Certain of our products are classified as medical devices and are subject to restrictions under domestic and foreign laws, rules, regulations, self-regulatory codes, circulars and orders, including, but not limited to, the FDCA, MDD in the European Union (and implementing and local measures adopted thereunder) and similar international laws and regulations. The FDCA requires these products, when sold in the United States, to be safe and effective for their intended use and to comply with the regulations administered by the FDA. Certain medical device products are also regulated by comparable agencies in non-U.S. countries in which they are produced or sold. If we do not comply with these laws, rules, regulations, codes, circulars and orders, we could experience increased regulatory enforcement and oversight or could incur significant monetary penalties, fines and costs, which could have an adverse effect on our business, results of operations and financial condition.

Our sales to the U.S. government are subject to compliance with regulatory and contractual requirements, and noncompliance could expose us to liability or impede current or future business.

The Government, as well as state and local governments, can typically terminate or modify their contracts with us either at their discretion or if we default by failing to perform under the terms of the applicable contract, which could

expose us to liability and impede our ability to compete in the future for contracts and orders. The failure to comply with regulatory and contractual requirements could subject us to investigations, price reductions, up to treble damages, fines or other sanctions and penalties. Additionally, violations of certain regulatory and contractual requirements could also result in us being suspended or debarred from future government contracting.

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We have sold our products and related services to the Government under General Services Administration Federal Supply Schedule contracts since 2002 and are currently selling our products and related services to the Government under two such GSA Contracts. Each GSA Contract is subject to extensive legal and regulatory requirements and includes, among other provisions, a price reduction clause (the "Price Reduction Clause"), which generally requires us to reduce the prices billed to the Government under the GSA Contracts to correspond to the lowest prices billed to certain benchmark customers.

Late in the fourth quarter of 2018, during an internal review we preliminarily determined that certain of our pricing practices may have resulted in the Government being overcharged under the Price Reduction Clauses of the GSA Contracts (the "GSA Matter"). On February 14, 2019, we reported the GSA Matter to the GSA and its Office of Inspector General.

Over the six-year period ended December 31, 2018, our sales to the Government under the GSA Contracts were approximately $53.5 million in the aggregate. Our sales to the Government under the GSA Contracts represented approximately 3.5% of our total sales for the year ended December 31, 2018. As a result of the GSA Matter, for the fourth quarter of 2018, we reduced our total sales by a $4.8 million estimated cumulative sales adjustment, representative of the last six years of estimated overcharges to the Government under the GSA Contracts. In addition, for the fourth quarter of 2018, we recorded $0.5 million of imputed interest related to the estimated cumulative sales adjustment, which increased other expense and resulted in an estimated total liability of $5.3 million for the GSA Matter. This estimate is based on our preliminary review as of the date of this Annual Report on Form 10-K and is subject to change based on the results of the review of our pricing and other practices under the GSA Contracts being conducted by our outside legal counsel (the "Review") and discussions with the Government.

While we have reported the GSA Matter to the GSA, the Government may conduct its own investigation or review (including an audit). We intend to cooperate fully with any Government inquiry. The Government's review of, or investigation into, this matter could result in civil and criminal penalties, administrative sanctions and contract remedies being imposed on us, including but not limited to, termination of the GSA Contracts, repayments of amounts already received under the GSA Contracts, forfeiture of profits, damages, suspension of payments, fines, and suspension or debarment from doing business with the Government and possibly U.S. state and local governments. We may also be subject to litigation and recovery under the federal False Claims Act and possibly similar state laws, which could include claims for treble damages, penalties, fees and costs. As a result, we cannot reasonably predict the outcome of the Government's review of, or investigation into, this matter at this time or the resulting future financial impact on us. Any of these outcomes could have a material adverse effect on our reputation, our sales, results of operations, cash flows and financial condition, and the trading price of our common stock. In addition, we have incurred, and will continue to incur, legal and related costs in connection with the Review and the Government's response to this matter.

Any failure to comply with the Foreign Corrupt Practices Act or similar anti-corruption laws could subject us to fines and penalties.

In 2012, our monitorship expired pursuant to our settlement with the SEC and the United States Department of Justice, or DOJ, concerning certain payments made by our subsidiary in China that may have violated the FCPA and other applicable laws. We are, of course, still subject to such laws and have adopted and maintain a compliance program designed to ensure compliance with these laws; however, in light of our prior conduct, any future failure to comply with any such continuing obligations could result in the SEC and the DOJ aggressively seeking to impose penalties against us. In addition, many countries in which we operate have increased regulation regarding anti-corruption practices generally. Compliance with such regulations could be costly and could adversely impact our results of operations or delay entry into new markets.

We may face difficulties managing the effects of any future growth.

If our business grows rapidly in the future, we expect it to result in:

- increased complexity;
- increased responsibility for existing and new management personnel; and

- incremental strain on our operations and financial and management systems.

If we are not able to manage the effects of any future growth, our business, financial condition and operating results may be harmed.

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Our dependence on suppliers for materials could impair our ability to manufacture our products.
Outside vendors provide key components used in the manufacture of our products. Any supply interruption in a limited source component would hinder our ability to manufacture our products until a new source of supply is identified. In addition, an uncorrected defect or supplier's variation in a component, either known or unknown, or incompatibility with our manufacturing processes, could hinder our ability to manufacture our products. We may not be able to find a sufficient alternative supplier in a reasonable period of time, or on commercially reasonable terms, if at all. If we fail to obtain a supplier for the manufacture of components of our products, we may experience delays or interruptions in our operations, which would adversely affect our business, results of operations and financial condition.

A valuation allowance may be required for our U.S. deferred tax assets, which may reduce our earnings and have a material adverse effect on our business, results of operations and financial condition.

Our balance sheet includes $14.7 million in deferred tax assets. Approximately half of that amount relates to U.S. deferred tax assets. On a quarterly basis, we assess our ability to realize our deferred tax assets to ensure no valuation allowance is required. The ultimate realization of our U.S. deferred tax assets is dependent upon our ability to generate future U.S. taxable income during the periods in which those deferred tax assets would be deductible. Our inability to realize our U.S. deferred tax assets may reduce our earnings and have a material adverse effect on our business, results of operations and financial condition. Based on an evaluation we conducted, we determined that it was not necessary to establish a valuation allowance against any of our U.S. deferred tax assets as of December 31, 2018. However, we will continue to monitor whether a valuation allowance is necessary, and if we are required to establish a valuation allowance against our deferred tax assets, it could have a material adverse effect on our results of operations and financial condition.

Risks generally associated with our information systems could adversely affect our business reputation and results of operations.
We rely on our information systems to obtain, rapidly process, analyze and manage data to, among other things:

- facilitate the purchase and distribution of thousands of inventory items;
- receive, process and ship orders on a timely basis;
- accurately bill and collect from customers;
- process payments to suppliers and employees; and
- summarize results and manage our business.

Our primary and back-up computer systems are subject to damage or interruption from power outages, computer and telecommunication failures, computer viruses, security breaches, natural disasters and errors by employees. Though losses arising from some of these issues would be covered by insurance, interruptions of our critical business computer systems or failure of our back-up systems could lead to a loss of sales or decreased profitability.
A cyberattack or security breach of our systems may compromise the confidentiality, integrity, or availability of our internal data and the availability of our products and websites designed to support our customers or their data. Computer hackers, foreign governments or cyber terrorists may attempt to penetrate our network security and our website. Unauthorized access to our proprietary business information or customer data may be obtained through break-ins, sabotage, breach of our secure network by an unauthorized party, computer viruses, computer denial-of-service attacks, employee theft or misuse or other misconduct. Because the techniques used by computer programmers who may attempt to penetrate and sabotage our network security or our website change frequently and may not be recognized until launched against a target, we may be unable to anticipate these techniques. It is also possible that unauthorized access to customer data may be obtained through inadequate use of security controls by customers, suppliers or other vendors. Any security breach, cyberattack or cyber security breach, and any incident involving the misappropriation, loss or other unauthorized disclosure of, or access to, sensitive or confidential customer information, whether involving us or involving one of our vendors, could require us to expend significant

resources to remediate any damage, could interrupt our operations and damage our reputation, and could also result in regulatory enforcement actions, material fines and penalties, litigation or other actions which could have a material adverse effect on our business, reputation and results of operations.

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We are subject to risks of natural disasters.

The occurrence of one or more natural disasters, such as tornadoes, hurricanes, earthquakes, floods and other forms of severe weather where we have a manufacturing facility could result in physical damage to, and complete or partial closure of, our manufacturing facilities, which could adversely affect our business, operations and financial performance. Interruptions in our manufacturing operations or damage to our manufacturing facilities could reduce our revenues and increase our costs, and the extent of losses from natural disasters and severe weather will be a function of both the severity of the event and the total amount of insured exposure. Although we maintain insurance coverage, we can offer no assurance that our insurance coverage will be adequate to cover any losses or that we will be able to maintain insurance at a reasonable cost in the future. If losses from business interruption or property damage exceed the amounts for which we are insured, our business, results of operations and financial condition could be adversely affected.

We may experience volatility in our stock price.

The price of our common stock has been, and may continue to be, highly volatile in response to various factors, many of which are beyond our control, including:

- fluctuations in demand for, and sales of, our products or prolonged downturns in the industries that we serve;
- actual or anticipated variations in quarterly or annual operating results;
- general economic uncertainties;
- speculation in the press or investment community; and
- announcements of technological innovations or new products by us or our competitors.

The market price of our common stock may also be affected by our inability to meet analyst and investor expectations and failure to achieve projected financial results. Any failure to meet such expectations or projected financial results, even if minor, could cause the market price of our common stock to decline significantly. Volatility in our stock price may result in the inability of our shareholders to sell their shares at or above the price at which they purchased them. Our relatively small public float and daily trading volume have in the past caused, and may in the future result in, significant volatility in our stock price. At December 31, 2018, we had approximately 17.0 million shares outstanding held by non-affiliates. Our daily trading volume for the year ended December 31, 2018 averaged approximately 88,446 shares.

In addition, stock markets have experienced in the past and may in the future experience a high level of price and volume volatility, and the market prices of equity securities of many companies have experienced in the past and may in the future experience wide price fluctuations not necessarily related to the operating performance of such companies. These broad market fluctuations may adversely affect the market price of our common stock. In the past, securities class action lawsuits frequently have been instituted against companies following periods of volatility in the market price of such companies' securities. If any such litigation is instigated against us, it could result in substantial costs and a diversion of management's attention and resources, which could have a material adverse effect on our results of operations and financial condition.

Anti-takeover provisions in our articles of incorporation, bylaws and provisions of Florida law could delay or prevent a change of control that you may favor.

Our articles of incorporation, bylaws and provisions of Florida law could make it more difficult for a third party to acquire us. Although we believe such provisions are appropriate to protect long-term value for our shareholders, these provisions could discourage potential takeover attempts and could adversely affect the market price of our shares. Because of these provisions, you might not be able to receive a premium on your investment. These provisions include:

- a limitation on shareholders' ability to call a special meeting of our shareholders;
- advance notice requirements to nominate directors for election to our board of directors or to propose matters that can be acted on by shareholders at shareholder meetings;

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- our classified board of directors, which means that approximately one-third of our directors are elected each year; and
- the authority of the board of directors to issue, without shareholder approval, preferred stock with such terms as the board of directors may determine.

The provisions described above could delay or make more difficult transactions involving a change in control of the Company or our management.

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ITEM 1B. UNRESOLVED STAFF COMMENTS

None.

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ITEM 2. PROPERTIES

The Americas

Our headquarters is located in a leased building in Lake Mary, Florida containing approximately 46,500 square feet. This facility houses our sales, marketing, customer service/application operations and administrative staff. Our U.S. production, research and development, service operations and manufacturing are located in another leased building in Lake Mary, Florida, which consists of approximately 35,000 square feet, a leased facility consisting of approximately 90,400 square feet located in Exton, Pennsylvania containing research and development, manufacturing and service operations of our FARO Laser Tracker™, FARO Focus, and FARO Laser Projector product lines, as well as a leased facility consisting of approximately 21,400 square feet located in Hudson, New Hampshire containing research and development, manufacturing, sales, and the service operations of our advanced galvanometer-based optical scanner product lines. We also lease a facility in Nuevo Leon, Mexico containing service and sales operations, which consists of approximately 36,000 square feet. The facilities in the Americas region serve all of our reporting segments.

Europe/Middle East/Africa

Our EMEA headquarters is located in a leased building in Stuttgart, Germany containing approximately 105,300 square feet. This facility houses the manufacturing, research and development, administration, sales, marketing and service management personnel for our EMEA operations. We have a leased manufacturing, research and development, and sales facility located in Brescia, Italy consisting of approximately 21,420 square feet. Additionally, we have a leased facility consisting of approximately 15,900 square feet located in Schaffhausen, Switzerland containing manufacturing operations for our products shipped to customers in EMEA. We also have a leased service and sales facility located in Warwickshire, Great Britain consisting of approximately 12,700 square feet. The facilities in the EMEA region serve all of our reporting segments.

Asia-Pacific

Our Asia-Pacific headquarters is located in a leased building in Singapore containing approximately 22,000 square feet. This facility houses the administration, sales, marketing, service management personnel and manufacturing for our Asia-Pacific operations. Our Japan operations are located in a leased building in Nagoya, Japan containing approximately 15,900 square feet. This facility houses our Japanese sales, marketing and service operations. Our China operations are located in a leased building in Shanghai, China containing approximately 24,700 square feet for sales, marketing and service operations. The facilities in the Asia-Pacific region serve all of our reporting segments. We believe our current facilities will be adequate for our needs in 2019 and that we will be able to locate suitable space for additional regional offices or enhanced production needs as necessary.

The information required by the remainder of this Item is incorporated herein by reference to Exhibit 99.1 to this Annual Report on Form 10-K.

ITEM 3. LEGAL PROCEEDINGS

We are not involved in any legal proceedings other than routine litigation arising in the normal course of business, none of which we believe will have a material adverse effect on our business, financial condition or results of operations.

ITEM 4. MINE SAFETY DISCLOSURES

Not applicable.

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PART II

ITEM 5. MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES

Market Information and Holders

Our common stock is listed and traded on the Nasdaq Global Select Market under the symbol “FARO”.
As of February 15, 2019, we had 47 holders of record of our common stock.

Dividends

To date, we have not paid any cash dividends on our common stock. We expect to retain future earnings for use in operating and expanding our business and we do not anticipate paying any cash dividends in the reasonably foreseeable future.

Recent Sales of Unregistered Securities

During the year ended December 31, 2018, we did not sell any equity securities that were not registered under the Securities Act.

Purchases of Equity Securities

On November 24, 2008, our Board of Directors approved a $30.0 million share repurchase program. Subsequently, in October 2015, our Board of Directors authorized an increase to the existing share repurchase program from $30.0 million to $50.0 million. In December 2018, our Board of Directors authorized management to utilize the share repurchase program, beginning January 1, 2019, to maintain the number of our issued and outstanding shares to address the dilutive impact of stock options exercises and the settlement of restricted stock units. Acquisitions for the share repurchase program may be made from time to time at prevailing prices as permitted by securities laws and other legal requirements and subject to market conditions and other factors under this program. The share repurchase program may be discontinued at any time. There is no expiration date or other restriction governing the period over which we can repurchase shares under the program. We made no stock repurchases during the years ended December 31, 2018 and 2017 under this program. As of December 31, 2018, we had authorization to repurchase $18.3 million of the $50.0 million authorized by our Board of Directors under the existing share repurchase program.

Performance Graph

The following performance graph and related information shall not be deemed to be“soliciting material” or to be “filed” with the SEC, nor shall such information be incorporated by reference into any future filing under the Securities Act or the Exchange Act, except to the extent that we specifically incorporate it by reference into such filing.

The following line graph compares the cumulative five-year returns of our common stock with (1) the cumulative returns of the Nasdaq Composite-Total Returns and (2) the Morningstar Scientific & Technical Instruments Index. For purposes of preparing the graph, we assumed that an investment of $100 was made at market close on December 31, 2013, the last trading day before the beginning of our fifth preceding fiscal year, with reinvestment of any dividends at the time they were paid. We did not pay any dividends during the period indicated.

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The comparison in the graph below is based on historical data. The stock price performance shown on the graph is not necessarily indicative of future price performance. Information used in the graph and table was obtained from Zacks Investment Research, a source believed to be reliable, but we are not responsible for any errors or omissions in such information.

Company/Market/Peer Group	2013	2014	2015	2016	2017	2018
FARO Technologies, Inc.	$100.00	$107.51	$50.63	$61.75	$80.62	$69.71
Nasdaq Composite-Total Returns	$100.00	$114.75	$122.74	$133.62	$173.22	$168.30
Morningstar Scientific & Technical Instruments	$100.00	$107.77	$93.74	$114.13	$159.88	$143.60

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ITEM 6. SELECTED FINANCIAL DATA

in thousands, except share and per-share data	Year ended December 31, 2018	2017	2016	2015	2014
Consolidated Statement of Operations Data:					
Sales	$403,627	$360,917	$325,584	$317,548	$341,826
Gross profit [1]	228,345	204,637	177,960	167,236	188,510
Income from operations	5,754	5,322	13,284	13,122	37,340
Income before income tax expense	4,558	5,827	12,626	12,806	37,522
Net income (loss)	4,930	(14,516)	11,107	12,813	33,649
Net income (loss) per common share:					
Basic	$0.29	$(0.87)	$0.67	$0.74	$1.95
Diluted	$0.29	$(0.87)	$0.67	$0.74	$1.93
Weighted average shares outstanding:					
Basic	17,043,167	16,711,534	16,654,786	17,288,665	17,247,727
Diluted	17,348,456	16,711,534	16,681,710	17,389,473	17,416,453
	As of December 31, 2018	2017	2016	2015	2014
Consolidated Balance Sheet Data:					
Working capital [2] [3]	$219,219	$218,274	$212,055	$221,335	$250,234
Total assets	506,244	458,578	423,714	409,186	425,463
Total debt-capital leases	360	475	21	28	8
Total shareholders' equity	376,609	352,066	339,657	327,644	343,854

(1) In 2016, certain prior year stock compensation expenses were reclassified between cost of sales, general and administrative, selling and marketing, and research and development expenses to reflect the appropriate departmental costs. As a result of this reclassification, gross profit for each of the years ended December 31, 2015 and 2014 was reduced by $0.4 million.

(2) In 2015, management reassessed certain inventory policies based on the then-current sales and customer trends. As a result, we now expect our sales demonstration inventory to be held by our sales representatives for more than one year. To reflect this change in policy, we reclassified $18.5 million as of December 31, 2015 and December 31, 2014 from current assets to long-term assets, impacting the working capital calculation.

(3) In 2017, we adopted Accounting Standards Update 2015-17, *Income Taxes (Topic 740): Balance Sheet Classification of Deferred Taxes* ("ASU 2015-17"), as issued by the Financial Accounting Standards Board, which requires that deferred tax liabilities and assets be classified as non-current in a classified balance sheet. We adopted ASU 2015-17 on a retrospective basis. As a result, the working capital amounts as of December 31, 2016, 2015 and 2014 have been reduced by $7.6 million, $7.8 million and $5.9 million, respectively, to conform with the current year presentation of deferred tax assets as non-current assets.

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ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

The following information should be read in conjunction with our Consolidated Financial Statements, including the notes thereto, included in Part II, Item 8 of this Annual Report on Form 10-K.

Overview and Highlights

We are a global technology company that designs, develops, manufactures, markets and supports software driven, three-dimensional ("3D") measurement and imaging solutions. This technology permits high-precision 3D measurement, imaging and comparison of parts and complex structures within production and quality assurance processes. Our devices are used for inspection of components and assemblies, rapid prototyping, reverse engineering, documenting large volume or structures in 3D, surveying and construction, as well as for investigation and reconstruction of accident sites or crime scenes. We sell the majority of our products through a direct sales force across a broad number of customers in a range of manufacturing, industrial, architecture, surveying, building information modeling, construction, public safety forensics, cultural heritage, dental, and other applications. Our FaroArm®, FARO ScanArm®, FARO Laser Tracker™, FARO Cobalt Array Imager, FARO Laser Projector, and their companion CAM2®, BuildIT, and BuildIT Projector software solutions, provide for Computer-Aided Design ("CAD") based inspection, factory-level statistical process control, high-density surveying and laser-guided assembly and production. Together, these products integrate the measurement, quality inspection, and reverse engineering functions with CAD and 3D software to improve productivity, enhance product quality, and decrease rework and scrap in the manufacturing process, mainly supporting applications in our 3D Manufacturing (formerly known as "Factory Metrology" and "3D Factory") vertical. Our FARO Focus, FARO ScanPlan and FARO Scanner Freestyle^{3D} X laser scanners, and their companion FARO SCENE, BuildIT, FARO As-Built™, and FARO Zone public safety forensics software offerings, are utilized for a wide variety of 3D modeling, documentation and high-density surveying applications in our Construction Building Information Modeling ("Construction BIM," formerly known as "Construction BIM-CIM") and Public Safety Forensics verticals. Our FARO ScanArm®, FARO Cobalt Array Imager, FARO Scanner Freestyle^{3D} X laser scanners and their companion SCENE software, and other 3D structured light scanning solutions specific to the dental industry, also enable a fully digital workflow used to capture real world geometry for the purpose of empowering design, enabling innovation, and speeding up the design cycle, supporting our 3D Design (formerly known as "Product Design") vertical. Our line of galvanometer-based scan heads and laser scan controllers are used in a variety of laser applications and are integrated into larger components and systems, supporting our Photonics vertical.

We derive our revenues primarily from the sale of our measurement equipment and related multi-faceted software programs. Revenue related to these products is generally recognized upon shipment. In addition, we sell extended warranties and training and technology consulting services relating to our products. We recognize the revenue from extended warranties on a straight-line basis over the term of the warranty, and revenue from training and technology consulting services when the services are provided.

We operate in international markets throughout the world and maintain sales offices in Australia, Brazil, Canada, China, France, Germany, India, Italy, Japan, Malaysia, Mexico, the Netherlands, Poland, Portugal, Singapore, South Korea, Spain, Switzerland, Thailand, Turkey, the United Kingdom, and the United States.

We manufacture our FaroArm® and FARO ScanArm® products in our manufacturing facility located in Switzerland for customer orders from Europe, the Middle East and Africa ("EMEA"), in our manufacturing facility located in Singapore for customer orders from the Asia-Pacific region, and in our manufacturing facility located in Florida for customer orders from the Americas. We manufacture our FARO Focus in our manufacturing facilities located in Germany and Switzerland for customer orders from EMEA and the Asia-Pacific region, and in our manufacturing facility located in Pennsylvania for customer orders from the Americas. We manufacture our FARO Freestyle^{3D} X products in our facility located in Germany. We manufacture our FARO Laser Tracker™ and our FARO Laser Projector products in our facility located in Pennsylvania. We manufacture our 3D structured light scanning solutions specific to the dental industry in our engineering and manufacturing facility in Italy. We expect all of our existing manufacturing facilities to have the production capacity necessary to support our volume requirements during 2019.

We account for wholly-owned foreign subsidiaries in the currency of the respective foreign jurisdiction; therefore, fluctuations in exchange rates may have an impact on the value of the intercompany account balances denominated in

different currencies and reflected in our consolidated financial statements. We are aware of the availability of off-balance sheet financial instruments to hedge exposure to foreign currency exchange rates, including cross-currency swaps, forward contracts and foreign currency options. However, we have not used such instruments in the past, and none were utilized in 2018, 2017 or 2016.

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Executive Summary

Our total sales increased $42.7 million, or 11.8%, to $403.6 million for the year ended December 31, 2018 from $360.9 million for the year ended December 31, 2017. This increase reflected improved growth in both product and service revenue, as we have continued to introduce new products and grow our global sales force consistent with our strategy.

We achieved numerous milestones in 2018 involving significant product launches, sales force growth and acquisitions:

Product innovation – In 2018, we launched several new products including:

FARO ScanPlan - The FARO ScanPlan is a handheld mapper that captures 2D floor plans. The FARO ScanPlan performs real-time capturing and diagramming of as-built floor plans of buildings for threat assessment, pre-incident planning and fire protection engineering. The FARO ScanPlan comes with FARO Zone 2D software to turn any floor plan map into a completed diagram by adding doors, stairs, hazardous materials, notes and dimensions, among others.

FARO Tracer^{SI} - The FARO Tracer^{SI} accurately projects a laser line onto a surface or object, providing a virtual template that operators and assemblers can use to quickly and accurately position components with confidence. The laser template is created using a 3D CAD model that enables the system to visually project a laser outline of parts, reference points, or areas of interest. The result is a virtual and collaborative 3D template to streamline a wide range of assembly and production applications.

FARO Design ScanArm®2.5C and FARO Prizm™ - The FARO Design ScanArm®2.5C is a color-capable, portable lightweight 3D ScanArm. Using the new FARO Prizm™ full-color Laser Line Probe with 3D design and modeling software, the FARO Design ScanArm®2.5C delivers high-resolution, color point-cloud data, enabling more insight into object design and creation.

FARO 8-Axis FaroArm® - This comprehensive solution combines either the portable Quantum FaroArm®, Quantum ScanArm or Design ScanArm® portfolio products with a functionally integrated, yet physically separate, 8th axis.

6DoF FARO Vantage Laser Tracker – Together with the hand-held 6Probe, a fully-integrated hand-held probe, the 6DoF FARO Vantage Laser Tracker expands the capabilities of large volume measurement by allowing users to access hidden, hard-to-reach locations by probing and scanning.

FARO Digi-Cube® – FARO Digi-Cube® is a high-precision, high scan rate, digital auto-controlled scan head that is easily integrated into a variety of laser scanning products. This product is used for exacting applications such as high accuracy laser marking, scribing and engraving, laser 3D printing, photovoltaic production and welding.

Global Sales Force – In 2018, consistent with our strategic initiative to drive sales growth, our worldwide period-ending selling headcount increased by 102, or 16.2%, to 733 at December 31, 2018 from 631 at December 31, 2017.

Acquisitions and Equity Investment – In July 2018, we acquired all of the issued and outstanding corporate capital of Opto-Tech SRL and its subsidiary Open Technologies SRL (collectively, “Open Technologies”), a 3D structured light scanning solution company located in Brescia, Italy. The acquisition supports our 3D Design vertical and our long-term strategy to establish a presence in 3D measurement technology used in other industries and applications, especially dental and medical.

In July 2018, we acquired all of the outstanding shares of Lanmark Controls, Inc. (“Lanmark”), a high-speed laser marking control boards and laser marking software provider located in Acton, Massachusetts. The acquisition supports the development of components used in new 3D laser inspection product development in order to further expand the product portfolio of our Photonics vertical.

In April 2018, we invested in Present4D GmbH (“Present4D”), a software solutions provider for professional virtual reality presentations and training environments, in the form of an equity capital contribution. This contribution represents a minority investment in Present4D and supports our Public Safety Forensics vertical.

In March 2018, we acquired all of the outstanding shares of Laser Control Systems Limited (“Laser Control Systems”), a laser component technology business located in Bedfordshire, United Kingdom, which specializes in the design and manufacture of advanced digital scan heads and laser software. Similar to our acquisition of Lanmark, this acquisition supports our Photonics vertical and our long-term strategy to expand our presence and product portfolio in Photonics applications.

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In March 2018, we acquired all of the outstanding shares of Photocore AG, a vision-based 3D measurement application and software developer located in Zürich, Switzerland. The acquisition supports our Construction BIM vertical and our long-term strategy to improve our existing software offerings with innovative technology in photogrammetry.

We have sold our products and related services to the U.S. Government (the "Government") under General Services Administration ("GSA") Federal Supply Schedule contracts (the "GSA Contracts") since 2002 and are currently selling our products and related services to the Government under two such GSA Contracts. Each GSA Contract is subject to extensive legal and regulatory requirements and includes, among other provisions, a price reduction clause (the "Price Reduction Clause"), which generally requires us to reduce the prices billed to the Government under the GSA Contracts to correspond to the lowest prices billed to certain benchmark customers.

Late in the fourth quarter of 2018, during an internal review we preliminarily determined that certain of our pricing practices may have resulted in the Government being overcharged under the Price Reduction Clauses of the GSA Contracts ("the GSA Matter"). On February 14, 2019, we reported the GSA Matter to the GSA and its Office of Inspector General.

Over the six-year period ended December 31, 2018, our sales to the Government under the GSA Contracts were approximately $53.5 million in the aggregate. Our sales to the Government under the GSA Contracts represented approximately 3.5% of our total sales for the year ended December 31, 2018. As a result of the GSA Matter, for the fourth quarter of 2018, we reduced our total sales by a $4.8 million estimated cumulative sales adjustment, representative of the last six years of estimated overcharges to the Government under the GSA Contracts. In addition, for the fourth quarter of 2018, we recorded $0.5 million of imputed interest related to the estimated cumulative sales adjustment, which increased other expense and resulted in an estimated total liability of $5.3 million for the GSA Matter. This estimate is based on our preliminary review as of the date of this Annual Report on Form 10-K and is subject to change based on the results of the review of our pricing and other practices under the GSA Contracts being conducted by our outside legal counsel and discussions with the Government.

Amounts reported in millions within this Annual Report on Form 10-K are computed based on the amounts in thousands. As a result, the sum of the components reported in millions may not equal the total amount reported in millions due to rounding. Certain columns and rows within the tables that follow may not add due to the use of rounded numbers. Percentages presented are calculated based on the respective amounts in thousands.

The amounts related to our reporting segment information for the year ended December 31, 2017 have been restated throughout this Annual Report on Form 10-K to reflect the changes in our reporting segments discussed below under "Segment Reporting." The amounts related to our reporting segment information for the year ended December 31, 2016 were restated but were not impacted by the changes in our reporting segments discussed below under "Segment Reporting."

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Results of Operations
2018 Compared to 2017

(dollars in millions)	Years ended December 31, 2018	% of Sales	2017	% of Sales	Change 2018 vs 2017
Product sales	$311.1	77.1 %	$277.9	77.0 %	$33.2
Service sales	92.5	22.9 %	83.0	23.0 %	9.5
Total sales	403.6	100.0 %	360.9	100.0 %	42.7
Product cost of sales	124.8	30.9 %	110.1	30.5 %	14.7
Service cost of sales	50.5	12.5 %	46.1	12.8 %	4.3
Total cost of sales (exclusive of depreciation and amortization, shown separately below)	175.3	43.4 %	156.3	43.3 %	19.0
Gross profit	228.3	56.6 %	204.6	56.7 %	23.7
Operating expenses					
Selling and marketing	116.9	29.0 %	103.5	28.7 %	13.4
General and administrative	47.7	11.8 %	43.8	12.1 %	3.9
Depreciation and amortization	18.3	4.5 %	16.6	4.6 %	1.7
Research and development	39.7	9.8 %	35.4	9.8 %	4.3
Total operating expenses	222.6	55.1 %	199.3	55.2 %	23.3
Other expense (income)	1.2	0.3 %	(0.5)	(0.1)%	1.7
Income tax (benefit) expense	(0.4)	(0.1)%	20.3	5.6 %	(20.7)
Net income (loss)	$4.9	1.2 %	$(14.5)	(4.0)%	$19.4

Consolidated Results

Sales. Total sales increased by $42.7 million, or 11.8%, to $403.6 million for the year ended December 31, 2018 from $360.9 million for the year ended December 31, 2017. As a result of the GSA Matter, for the fourth quarter of 2018, we reduced our total sales by a $4.8 million estimated cumulative sales adjustment, representative of the last six years of estimated overcharges to the Government under the GSA Contracts (the "GSA cumulative sales adjustment"). Total product sales increased by $33.2 million, or 11.9%, to $311.1 million for the year ended December 31, 2018 from $277.9 million for the year ended December 31, 2017. Our product sales increase reflected higher unit sales within our Construction BIM and Emerging Verticals segments, as well as higher average selling prices within our 3D Manufacturing segment, partially offset by the GSA cumulative sales adjustment. Service revenue increased by $9.5 million, or 11.5%, to $92.5 million for the year ended December 31, 2018 from $83.0 million for the year ended December 31, 2017, primarily due to an increase in warranty and customer service revenue driven by the growth of our installed, serviceable base and focused sales initiatives in all of our segments, partially offset by the GSA cumulative sales adjustment. Foreign exchange rates had a positive impact on sales of $2.5 million, increasing our overall sales growth by approximately 0.7 percentage points, primarily due to the strengthening of the Euro, Japanese Yen and Chinese Yuan relative to the U.S. dollar.

Gross profit. Gross profit increased by $23.7 million, or 11.6%, to $228.3 million for the year ended December 31, 2018 from $204.6 million for the year ended December 31, 2017. Gross margin decreased to 56.6% for the year ended December 31, 2018 from 56.7% in the prior year period. Gross margin from product revenue decreased by 0.5 percentage points to 59.9% for the year ended December 31, 2018 from 60.4% in the prior year period. This decrease in gross margin from product revenue was primarily due to the GSA cumulative sales adjustment recorded in the

fourth quarter of 2018 and a $4.7 million inventory reserve charge recorded during the third quarter of 2018 resulting from an analysis of our inventory reserves in connection with

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our new product introductions and acquisitions, increasing our reserve for excess and obsolete inventory, partially offset by higher average selling prices in our 3D Manufacturing segment and improved manufacturing efficiencies. Gross margin from service revenue increased by 1.0 percentage points to 45.4% for the year ended December 31, 2018 from 44.4% for the prior year period, primarily due to higher warranty and customer service revenue, partially offset by an increase in cost of sales for service revenue and the effects of the GSA cumulative sales adjustment.

Selling and marketing expenses. Selling and marketing expenses increased by $13.4 million, or 12.9%, to $116.9 million, for the year ended December 31, 2018 from $103.5 million for the year ended December 31, 2017. This increase was driven primarily by our investment in increased selling headcount as part of our global initiatives to drive sales growth and the related compensation cost, as well as an increase in commission expense driven by our increased sales. Selling and marketing expenses as a percentage of sales were 29.0% for the year ended December 31, 2018 compared with 28.7% for the year ended December 31, 2017. Our worldwide period-ending selling headcount increased by 102, or 16.2%, to 733 at December 31, 2018 from 631 at December 31, 2017.

General and administrative expenses. General and administrative expenses increased by $3.9 million, or 8.8%, to $47.7 million for the year ended December 31, 2018 from $43.8 million for the year ended December 31, 2017. This increase in general and administrative expenses was primarily driven by higher compensation and professional services spending related to our business acquisitions, as well as costs associated with implementing the European Union's General Data Protection Regulation. General and administrative expenses decreased to 11.8% of sales for the year ended December 31, 2018 compared to 12.1% of sales in the prior year, primarily due to the leveraging effect of increased sales.

Depreciation and amortization expenses. Depreciation and amortization expenses increased by $1.7 million, or 10.4%, to $18.3 million for the year ended December 31, 2018 from $16.6 million for the year ended December 31, 2017. This increase in depreciation and amortization expenses was primarily due to higher amortization of intangible assets related to acquisitions and new production tooling for the manufacture of our new products.

Research and development expenses. Research and development expenses increased $4.3 million, or 12.2%, to $39.7 million for the year ended December 31, 2018 from $35.4 million for the year ended December 31, 2017. This increase in research and development expenses was mainly due to increased engineering headcount and the related compensation expense. The increased engineering headcount was partly due to our recent acquisitions and was also in connection with our activities to accelerate new product development for both hardware and software platforms in all of our segments. Research and development expenses as a percentage of sales remained flat at 9.8% for the years ended December 31, 2018 and December 31, 2017.

Other expense (income). Other expense was $1.2 million for the year ended December 31, 2018 compared to other income of $0.5 million for the year ended December 31, 2017. This change was primarily driven by the $0.5 million of imputed interest expense recorded in the fourth quarter of 2018 related to the GSA cumulative sales adjustment and the effect of foreign exchange rates on the value of the current intercompany account balances of our subsidiaries denominated in other currencies.

Income tax (benefit) expense. Income tax benefit for the year ended December 31, 2018 was $0.4 million compared with income tax expense of $20.3 million for the year ended December 31, 2017. This change was primarily due to the higher income tax expense for the year ended December 31, 2017 related to the U.S. Tax Cuts and Jobs Act of 2017 (the "U.S. Tax Reform").

On December 22, 2017, the United States enacted the U.S. Tax Reform, resulting in significant modifications to existing law. We followed the guidance in Securities and Exchange Commission Staff Accounting Bulletin 118 ("SAB 118"), which provided additional clarification regarding the application of Financial Accounting Standards Board ("FASB") Accounting Standards Codification ("ASC") Topic 740, *Income Taxes* ("FASB ASC Topic 740"), if a company did not have the necessary information available, prepared or analyzed in reasonable detail to complete the accounting for certain income tax effects of the U.S. Tax Reform for the reporting period in which the U.S. Tax Reform was enacted. As a result, in accordance with the U.S. Tax Reform, we recorded a provisional amount of $19.4 million of additional income tax expense in the fourth quarter of 2017, the period in which the legislation was enacted. The portion of this $19.4 million provisional amount that related to the transition tax on the mandatory deemed repatriation

of foreign earnings was $17.4 million based on our best estimate and guidance available at that time.

As additional guidance was released during the SAB 118 remeasurement period, we completed our transition tax analysis, which resulted in an income tax benefit of $1.0 million and a $1.8 million decrease of our deferred tax assets recorded in the fourth quarter of 2018 related to adjustments to the transition tax on mandatory deemed repatriation of foreign earnings.

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Net income (loss). Net income was $4.9 million for the year ended December 31, 2018 compared with a net loss of $14.5 million for the year ended December 31, 2017, reflecting the impact of the factors described above.

Segment Results

We use segment profit to evaluate the performance of our reporting segments, which are 3D Manufacturing, Construction BIM and Emerging Verticals. Segment profit is calculated as gross profit less selling and marketing expenses for the reporting segment. The discussion of segment results for the years ended December 31, 2018 and 2017 presented below is based on segment profit, as described above, and segment profit as a percent of sales, which is calculated as segment profit divided by total sales for such reporting segment, which we believe will aid investors in understanding and analyzing our operating results. Our definition of segment profit may not be comparable to similarly-titled measures reported by other companies. For additional information, including a reconciliation of total segment profit to income from operations, see Note 18 to the "Notes to Consolidated Financial Statements" included in Part II, Item 8 of this Annual Report on Form 10-K. During 2018, the following changes were made to our verticals and reporting segments:

- In the first quarter of 2018, we combined our historical Factory Metrology and 3D Machine Vision verticals under a single reporting segment, 3D Factory, which replaced our Factory Metrology reporting segment, due to the linkage between the two historical verticals related to the type or class of customers served, the nature of the products and services provided, and the nature of the production processes. The 3D Machine Vision vertical was previously reported in our Other reporting segment.
- In the first quarter of 2018, we renamed our Construction BIM-CIM vertical and reporting segment "Construction BIM."
- In the first quarter of 2018, we renamed our Other reporting segment "Emerging Verticals."
- In the third quarter of 2018, we merged the historical Factory Metrology and 3D Machine Vision verticals into one vertical named "3D Factory" for greater consistency with our realigned reporting segments.
- In the third quarter of 2018, we segregated the operations of our acquisitions of Laser Control Systems and Lanmark, along with the operations resulting from our acquisition of substantially all of the assets of Instrument Associates, LLC d/b/a Nutfield Technology ("Nutfield"), into a vertical that we named "Photonics." The creation of this vertical enables us to better focus on our product range directed at laser steering. These operations were historically reported in the 3D Factory reporting segment in the first six months of 2018 and the historical Factory Metrology reporting segment in 2017 and are now included in the Emerging Verticals (formerly known as "Other") reporting segment. Due to this change, we performed a qualitative goodwill impairment analysis in the third quarter of 2018, and management concluded there was no goodwill impairment at the time of this vertical reporting change.
- In the third quarter of 2018, we renamed our Product Design vertical "3D Design."
- In the fourth quarter of 2018, we renamed our 3D Factory vertical and reporting segment "3D Manufacturing."

There were no changes in our total consolidated financial condition or results of operations previously reported as a result of the changes in our verticals and reporting segments. The amounts related to our reporting segment information for the year ended December 31, 2017 have been restated throughout this Annual Report on Form 10-K to reflect the above changes in our reporting segments. The amounts related to our reporting segment information for the year ended December 31, 2016 were restated but were not impacted by the above changes in our reporting segments. Each of our reporting segments continue to employ consistent accounting policies.

3D Manufacturing	Years ended December 31,	
(dollars in millions)	2018	2017
Total sales	$264.4	$243.5
Segment profit	$80.8	$77.5
Segment profit as a % of 3D Manufacturing segment sales	30.5 %	31.8 %

Sales. Sales in our 3D Manufacturing segment increased $20.9 million, or 8.6%, to $264.4 million for the year ended December 31, 2018 from $243.5 million in the prior year, primarily driven by higher average selling prices and

continued growth in service revenue. These increases were partially offset by a $3.0 million sales reduction in the fourth quarter of 2018 related to the GSA cumulative sales adjustment.

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Segment profit. Segment profit in our 3D Manufacturing segment increased $3.3 million, or 4.2%, to $80.8 million for the year ended December 31, 2018 from $77.5 million in the prior year. This increase was primarily due to higher sales, partially offset by our investment in increased selling headcount as part of our global initiatives to drive sales growth and the related compensation cost, as well as an increase in commission expense driven by our increased sales and an increase in our inventory reserve. During the third quarter of 2018, we performed an analysis of our inventory reserves in connection with our new product introductions and acquisitions and recorded a charge of $3.9 million, increasing our reserve for excess and obsolete inventory primarily based on the determination that quantities on-hand for certain legacy products exceeded our revised sales projections.

Construction BIM	Years ended December 31,	
(dollars in millions)	2018	2017
Total sales	$96.2	$86.3
Segment profit	$27.5	$21.1
Segment profit as a % of Construction BIM segment sales	28.6 %	24.4 %

Sales. Sales in our Construction BIM segment increased $9.9 million, or 11.4%, to $96.2 million for the year ended December 31, 2018 from $86.3 million in the prior year, primarily reflecting an increase in product unit sales and service revenue. These increases were partially offset by a $0.2 million sales reduction in the fourth quarter of 2018 related to the GSA cumulative sales adjustment.

Segment profit. Segment profit in our Construction BIM segment increased $6.4 million, or 30.5%, to $27.5 million for the year ended December 31, 2018 from $21.1 million in the prior year. This increase was primarily due to the increase in product unit sales and higher service revenue, partially offset by our investment in increased selling headcount as part of our global initiatives to drive sales growth and the related compensation cost, as well as an increase in commission expense driven by our increased sales and an increase in our inventory reserve. During the third quarter of 2018, we performed an analysis of our inventory reserves in connection with our new product introductions and acquisitions and recorded a charge of $0.8 million, increasing our reserve for excess and obsolete inventory primarily based on the determination that quantities on-hand for certain legacy products exceeded our revised sales projections.

Emerging Verticals	Years ended December 31,	
(dollars in millions)	2018	2017
Total sales	$43.0	$31.1
Segment profit	$3.1	$2.5
Segment profit as a % of Emerging Vertical segment sales	7.3 %	8.0 %

Sales. Sales in our Emerging Verticals segment increased $11.9 million, or 38.3%, to $43.0 million for the year ended December 31, 2018 from $31.1 million in the prior year, primarily due to higher product unit sales in our Public Safety Forensics, Photonics and 3D Design verticals as we continue to strategically invest in new markets both organically and through acquisitions. These increases were partially offset by a $1.6 million sales reduction in the fourth quarter of 2018 related to the GSA cumulative sales adjustment.

Segment profit. Segment profit in our Emerging Verticals segment increased $0.6 million, or 26.5%, to $3.1 million for the year ended December 31, 2018 from $2.5 million in the prior year. This increase was primarily due to higher sales in all verticals, partially offset by our investment in increased selling headcount as part of our global initiatives to drive sales growth and the related compensation cost, as well as an increase in commission expense driven by our increased sales.

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2017 Compared to 2016

	Years ended December 31,								
	2017			2016			Change		
(dollars in millions)		% of Sales			% of Sales		2017 vs 2016		
Product sales	$277.9	77.0	%	$256.0	78.6	%	$21.9		
Service sales	83.0	23.0	%	69.6	21.4	%	13.4		
Total sales	360.9	100.0	%	325.6	100.0	%	35.3		
Product cost of sales	110.1	30.5	%	108.0	33.2	%	2.2		
Service cost of sales	46.1	12.8	%	39.7	12.2	%	6.5		
Total cost of sales	156.3	43.3	%	147.6	45.3	%	8.7		
Gross profit	204.6	56.7	%	178.0	54.7	%	26.7		
Operating expenses									
Selling and marketing	103.5	28.7	%	79.9	24.5	%	23.6		
General and administrative	43.8	12.1	%	40.8	12.5	%	3.0		
Depreciation and amortization	16.6	4.6	%	13.9	4.3	%	2.7		
Research and development	35.4	9.8	%	30.1	9.3	%	5.3		
Total operating expenses	199.3	55.2	%	164.7	50.6	%	34.6		
Other (income) expense	(0.5	) (0.1	) %	0.7	0.2	%	(1.2	)	
Income tax expense	20.3	5.6	%	1.5	0.5	%	18.8		
Net (loss) income	$(14.5	) (4.0	) %	$11.1	3.4	%	$(25.6)		

Consolidated Results

Sales. Total sales increased by $35.3 million, or 10.9%, to $360.9 million for the year ended December 31, 2017 from $325.6 million for the year ended December 31, 2016. Our sales increase was primarily driven by a strong increase in our Construction BIM segment, growth in warranty revenue, and a modest increase in average selling prices. Total product sales increased by $21.9 million, or 8.6%, to $277.9 million for the year ended December 31, 2017 from $256.0 million for the year ended December 31, 2016. Our product sales increase reflected an increase in unit sales within our Construction BIM segment, as well as higher average selling prices attributable to technological advances. Service revenue increased by $13.4 million, or 19.3%, to $83.0 million for the year ended December 31, 2017 from $69.6 million for the year ended December 31, 2016, primarily due to an increase in warranty and customer service revenue driven by the growth of our installed, serviceable base and focused sales initiatives. Foreign exchange rates had a slightly positive impact on sales of $1.9 million, increasing our overall sales growth by 0.6 percentage points, primarily due to the strengthening of the Euro relative to the U.S. dollar offset partly by the weakening of the Japanese Yen relative to the U.S. dollar.

Gross profit. Gross profit increased by $26.6 million, or 15.0%, to $204.6 million for the year ended December 31, 2017 from $178.0 million for the year ended December 31, 2016. Gross margin increased to 56.7% for the year ended December 31, 2017 from 54.7% in the prior year period. Gross margin from product revenue increased by 2.6 percentage points to 60.4% for the year ended December 31, 2017 from 57.8% in the prior year period. This increase was primarily due to higher average selling prices in our products attributable to our new product introductions and improved manufacturing efficiencies. Gross margin from service revenue increased by 1.4 percentage points to 44.4% for the year ended December 31, 2017 from 43.0% for the prior year period, primarily due to higher warranty and customer service revenue.

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Selling and marketing expenses. Selling and marketing expenses increased by $23.6 million, or 29.6%, to $103.5 million, for the year ended December 31, 2017 from $79.9 million for the year ended December 31, 2016. This increase was driven primarily by higher compensation expense, reflecting our investment in selling headcount as part of our global strategic initiatives to drive sales growth. Selling and marketing expenses as a percentage of sales were 28.7% for the year ended December 31, 2017 compared with 24.5% for the year ended December 31, 2016. Our worldwide period-ending selling headcount increased by 95, or 17.7%, to 631 at December 31, 2017 from 536 at December 31, 2016.

General and administrative expenses. General and administrative expenses increased by $3.0 million, or 7.3%, to $43.8 million for the year ended December 31, 2017 from $40.8 million for the year ended December 31, 2016. This increase in general and administrative expenses was primarily driven by higher compensation and global system expenses. The higher global system expenses resulted from our strategic initiative to harmonize global verticals through the implementation of entity-wide systems, such as our human resource information system. General and administrative expenses were 12.1% of sales for the year ended December 31, 2017 compared to 12.5% of sales in the prior year.

Depreciation and amortization expenses. Depreciation and amortization expenses increased by $2.7 million, or 19.6%, to $16.6 million for the year ended December 31, 2017 from $13.9 million for the year ended December 31, 2016. This increase in depreciation and amortization expenses was primarily due to higher amortization of intangible assets related to acquisitions and new production tooling for the manufacture of our new products.

Research and development expenses. Research and development expenses increased $5.3 million, or 17.4%, to $35.4 million for the year ended December 31, 2017 from $30.1 million for the year ended December 31, 2016. This increase in research and development expenses was mainly due to higher compensation expense resulting from increased headcount in connection with our acquisitions. Research and development expenses as a percentage of sales increased to 9.8% for the year ended December 31, 2017 from 9.3% for the year ended December 31, 2016.

Other (income) expense. Other income was $0.5 million for the year ended December 31, 2017 compared to Other expense of $0.7 million for the year ended December 31, 2016. The change was primarily driven by foreign exchange transaction gains resulting from the positive impact of changes in foreign exchange rates on the value of the current intercompany account balances of our subsidiaries denominated in other currencies during the year ended December 31, 2017 compared to losses resulting from the negative impact of changes in foreign exchange rates during the year ended December 31, 2016.

Income tax expense. Income tax expense for the year ended December 31, 2017 was $20.3 million compared with income tax expense of $1.5 million for the year ended December 31, 2016. The increase was primarily related to tax expense of $19.4 million recorded in the fourth quarter of 2017 pursuant to the U.S. Tax Reform. $17.4 million of this expense related to the provisional transition tax expense on the mandatory deemed repatriation of foreign earnings. $2.0 million of this expense related to the remeasurement of our deferred tax assets and liabilities that we expect to utilize in the future as a result of the U.S. Tax Reform decreasing the United States statutory corporate tax rate from 35% to 21% for tax years beginning January 1, 2018.

Net (loss) income. Net loss was $14.5 million for the year ended December 31, 2017 compared with net income of $11.1 million for the year ended December 31, 2016, reflecting the impact of the factors described above.

Segment Results

3D Manufacturing

(dollars in millions)	Years ended December 31, 2017	2016
Total sales	$243.5	$236.3
Segment profit	$77.5	$73.7
Segment profit as a % of 3D Manufacturing segment sales	31.8 %	31.2 %

Sales. Sales in our 3D Manufacturing segment increased $7.2 million, or 3.0%, to $243.5 million for the year ended December 31, 2017 from $236.3 million in the prior year, primarily reflecting higher average selling prices and higher service revenue.

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Segment profit. Segment profit in our 3D Manufacturing segment increased $3.8 million, or 5.2%, to $77.5 million for the year ended December 31, 2017 from $73.7 million in the prior year. This increase was primarily due to the increase in average selling prices and service revenue, partially offset by an increase in selling and marketing expenses reflecting higher headcount.

Construction BIM	Years ended December 31,	
(dollars in millions)	2017	2016
Total sales	$86.3	$65.1
Segment profit	$21.1	$14.8
Segment profit as a % of Construction BIM segment sales	24.4 %	22.7 %

Sales. Sales in our Construction BIM segment increased $21.2 million, or 32.6%, to $86.3 million for the year ended December 31, 2017 from $65.1 million in the prior year, primarily reflecting an increase in units sold and higher service revenue.

Segment profit. Segment profit in our Construction BIM segment increased $6.3 million, or 42.4%, to $21.1 million for the year ended December 31, 2017 from $14.8 million in the prior year. This increase was primarily due to the increase in units sold and higher service revenue, partially offset by an increase in selling and marketing expenses reflecting higher headcount.

Emerging Verticals	Years ended December 31,	
(dollars in millions)	2017	2016
Total sales	$31.1	$24.2
Segment profit	$2.5	$9.6
Segment profit as a % of Emerging Vertical segment sales	8.0 %	39.8 %

Sales. Sales in our Emerging Verticals segment increased $6.9 million, or 28.5%, to $31.1 million for the year ended December 31, 2017 from $24.2 million in the prior year, primarily reflecting an increase in unit sales and higher service revenue.

Segment profit. Segment profit in our Emerging Verticals segment decreased $7.1 million, or 73.7%, to $2.5 million for the year ended December 31, 2017 from $9.6 million in the prior year. This decrease was primarily due to an increase in selling and marketing expenses reflecting higher headcount as part of our long-term initiatives to grow these emerging verticals, partially offset by an increase in unit sales and higher service revenue.

Liquidity and Capital Resources

Cash and cash equivalents decreased by $32.2 million to $108.8 million at December 31, 2018 from $141.0 million at December 31, 2017. The decrease was primarily driven by cash paid for acquisitions of $27.1 million and for our $1.8 million equity investment in Present4D, our investment of $14.0 million in U.S. Treasury Bills, and property and equipment purchases of $11.0 million. These decreases were partially offset by $20.9 million in proceeds received from the exercise of stock options and $6.3 million of net cash provided by operations during the twelve months ended December 31, 2018.

Cash flows from operating activities provide our primary source of liquidity. We generated positive cash flows from operations of $6.3 million during the year ended December 31, 2018 compared to $10.4 million during the year ended December 31, 2017. The decrease was mainly due to changes in working capital, primarily driven by increases in our Accounts receivable, net, Inventories, and Prepaid expenses and other assets.

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Cash flows used in investing activities during the year ended December 31, 2018 were $55.8 million compared with cash flows provided by investing activities of $15.1 million during the year ended December 31, 2017. The change was primarily due to cash paid for acquisitions of $27.1 million, for our $1.8 million equity investment in Present4D, and for our investment of $14.0 million in U.S. Treasury Bills during the year ended December 31, 2018, compared to the maturity of $32.0 million in U.S. Treasury Bills in 2017 that were not re-invested and cash paid for acquisitions of $5.6 million during the year ended December 31, 2017.

Cash flows provided by financing activities during the years ended December 31, 2018 and December 31, 2017 were $19.8 million and $3.0 million, respectively. The increase was primarily driven by increased proceeds from the issuance of stock relating to the exercise of stock options during the year ended December 31, 2018.

Of our cash and cash equivalents, $77.5 million was held by foreign subsidiaries as of December 31, 2018. On December 22, 2017, the United States enacted the U.S. Tax Reform, resulting in significant modifications to existing law, which included a transition tax on the mandatory deemed repatriation of foreign earnings. Despite the changes in US tax law, our current intent is to indefinitely reinvest these funds in our foreign operations, as the cash is needed to fund ongoing operations.

On November 24, 2008, our Board of Directors approved a $30.0 million share repurchase program. Subsequently, in October 2015, our Board of Directors authorized an increase to the existing share repurchase program from $30.0 million to $50.0 million. In December 2018, our Board of Directors authorized management to utilize the share repurchase program, beginning January 1, 2019, to maintain the number of our issued and outstanding shares to address the dilutive impact of stock options exercises and the settlement of restricted stock units. Acquisitions for the share repurchase program may be made from time to time at prevailing prices as permitted by securities laws and other legal requirements and subject to market conditions and other factors under this program. The share repurchase program may be discontinued at any time. There is no expiration date or other restriction governing the period over which we can repurchase shares under the program. We made no stock repurchases during the years ended December 31, 2018 and 2017 under this program. As of December 31, 2018, we had authorization to repurchase $18.3 million of the $50.0 million authorized by our Board of Directors under the existing share repurchase program.

We believe that our working capital and anticipated cash flow from operations will be sufficient to fund our long-term liquidity operating requirements for at least the next 12 months.

We have no off balance sheet arrangements.

Contractual Obligations and Commercial Commitments

We are party to capital leases on equipment with an initial term of 36 to 60 months and other non-cancellable operating leases. These obligations are presented below as of December 31, 2018 (dollars in thousands):

	Payments Due by Period				
Contractual Obligations	**Total**	**< 1 Year**	**1-3 Years**	**3-5 Years**	**> 5 Years**
Operating lease obligations	$19,628	$7,474	$6,403	$2,583	$3,168
Capital lease obligations	360	117	243	—	$—
Purchase obligations	59,168	56,852	2,316	—	—
Transition tax liability	13,413	1,166	2,333	3,353	6,561
Other obligations	5,531	5,531	—	—	—
Total	$98,100	$71,140	$11,295	$5,936	$9,729

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We enter into purchase commitments for products and services in the ordinary course of business. These purchases generally cover production requirements for 60 to 120 days as well as materials necessary to service customer units through the product lifecycle and for warranty commitments. As of December 31, 2018, we had approximately $56.9 million in purchase commitments that are expected to be delivered within the next 12 months. To ensure adequate component availability in preparation for new product introductions, we also had $2.3 million in long-term commitments for purchases to be delivered after 12 months. During the fourth quarter of 2017, we recorded a provisional amount of $17.4 million related to the increase to our taxes payable pursuant to the U.S. Tax Reform associated with the mandatory deemed repatriation of the earnings of our foreign subsidiaries, or transition tax. During the fourth quarter of 2018, we decreased the provisional estimate of the one-time transition tax by $2.8 million upon completing our analysis of earnings and profits of our foreign subsidiaries and utilization of foreign tax credits. $1.8 million of the decrease related to a change in our deferred tax assets, and $1.0 million was an income tax benefit recorded in the fourth quarter of 2018. We made our first transition tax payment in 2018 and will pay the remaining liability over the next seven years. Other obligations included in the table primarily represent estimated payments due for acquisition related earn-outs.

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Inflation

Inflation did not have a material impact on our results of operations in recent years, and we do not expect inflation to have a material impact on our operations in 2019.

Critical Accounting Policies

The preparation of our consolidated financial statements requires our management to make estimates and assumptions that affect the reported amounts of assets, liabilities, revenues, and expenses, as well as disclosure of contingent assets and liabilities. We base our estimates on historical experience, along with various other factors believed to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying value of assets and liabilities that are not readily apparent from other sources. Some of these judgments can be subjective and complex and, consequently, actual results may differ from these estimates under different assumptions or conditions. While for any given estimate or assumption made by our management there may be other estimates or assumptions that are reasonable, we believe that, given the current facts and circumstances, it is unlikely that applying any such other reasonable estimate or assumption would materially impact the financial statements.

In response to the Securities and Exchange Commission's financial reporting release, FR-60, “Cautionary Advice Regarding Disclosure About Critical Accounting Policies,” we have selected our critical accounting policies for purposes of explaining the methodology used in our calculation, in addition to any inherent uncertainties pertaining to the possible effects on our financial condition. The critical policies discussed below are our processes of recognizing revenue, the reserve for excess and obsolete inventory, income taxes, the reserve for warranties, goodwill impairment, business combinations and stock-based compensation. These policies affect current assets, current liabilities and operating results and are therefore critical in assessing our financial and operating status. These policies involve certain assumptions that, if incorrect, could have an adverse impact on our operating results and financial position.

Revenue Recognition

For arrangements with multiple performance obligations, which represent promises within an arrangement that are capable of being distinct, we allocate revenue to all distinct performance obligations based on their relative standalone selling prices (“SSP”). When available, we use observable prices to determine the SSP. When observable prices are not available, SSPs are established that reflect our best estimates of what the selling prices of the performance obligations would be if they were sold regularly on a standalone basis.

Revenue related to our measurement and imaging equipment and related software is generally recognized upon shipment from our facilities or when delivered to the customer location, as determined by the agreed upon shipping terms, at which time we are entitled to payment and title and control has passed to the customer. Fees billed to customers associated with the distribution of products are classified as revenue. We warrant our products against defects in design, materials and workmanship for one year. A provision for estimated future costs relating to warranty expense is recorded when products are shipped. We separately sell extended warranties. Extended warranty revenues are recognized on a straight-line basis over the term of the warranty. Costs relating to extended warranties are recognized as incurred. Revenue from sales of software only is recognized when no further significant production, modification or customization of the software is required and when the risks and rewards of ownership have passed to the customer. These software arrangements generally include short-term maintenance that is considered post-contract support (“PCS”), which is considered to be a separate performance obligation. We generally establish standalone sales price for this PCS component based on our maintenance renewal rate. Maintenance renewals, when sold, are recognized on a straight-line basis over the term of the maintenance agreement. Revenues resulting from sales of comprehensive support, training and technology consulting services are recognized as such services are performed and are deferred when billed in advance of the performance of services. Payment for products and services is collected within a short period of time following transfer of control or commencement of delivery of services, as applicable. Revenues are presented net of sales-related taxes.

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Reserve for Excess and Obsolete Inventory

Because the value of inventory that will ultimately be realized cannot be known with exact certainty, we rely upon both past sales history and future sales forecasts to provide a basis for the determination of the reserve. Inventory is considered potentially obsolete if we have withdrawn those products from the market or had no sales of the product for the past 12 months and have no sales forecasted for the next 12 months. Inventory is considered potentially excess if the quantity on hand exceeds 12 months of expected remaining usage. The resulting obsolete and excess parts are then reviewed to determine if a substitute usage or a future need exists. Items without an identified current or future usage are reserved in an amount equal to 100% of the first-in first-out cost of such inventory. Our products are subject to changes in technologies that may make certain of our products or their components obsolete or less competitive, which may increase our historical provisions to the reserve.

Income Taxes

We review our deferred tax assets on a regular basis to evaluate their recoverability based upon expected future reversals of deferred tax liabilities, projections of future taxable income, and tax planning strategies that we might employ to utilize such assets, including net operating loss carryforwards. Based on the positive and negative evidence of recoverability, we establish a valuation allowance against the net deferred assets of a taxing jurisdiction in which we operate, unless it is “more likely than not” that we will recover such assets through the above means. Our evaluation of the need for the valuation allowance is significantly influenced by our ability to achieve profitability and our ability to predict and achieve future projections of taxable income.

Significant judgment is required in determining our worldwide provision for income taxes. In the ordinary course of operating a global business, there are many transactions for which the ultimate tax outcome is uncertain. We establish provisions for income taxes when, despite the belief that tax positions are fully supportable, there remain certain positions that do not meet the minimum probability threshold as described by FASB ASC Topic 740, which is a tax position that is more likely than not to be sustained upon examination by the applicable taxing authority. In the ordinary course of business, we are examined by various federal, state, and foreign tax authorities. We regularly assess the potential outcome of these examinations and any future examinations for the current or prior years in determining the adequacy of our provision for income taxes. We assess the likelihood and amount of potential adjustments and adjust the income tax provision, the current tax liability and deferred taxes in the period in which the facts that gave rise to a revision become known.

Reserve for Warranties

We establish at the time of sale a liability for the one-year warranty included with the initial purchase price of our products, based upon an estimate of the repair expenses likely to be incurred for the warranty period. The warranty period is measured in installation-months for each major product group. The warranty reserve is included in accrued liabilities in the accompanying consolidated balance sheets. The warranty expense is estimated by applying the actual total repair expenses for each product group in the prior period and determining a rate of repair expense per installation-month. This repair rate is multiplied by the number of installation-months of warranty for each product group to determine the provision for warranty expenses for the period. We evaluate our exposure to warranty costs at the end of each period using the estimated expense per installation-month for each major product group, the number of units remaining under warranty, and the remaining number of months each unit will be under warranty. We have a history of new product introductions and enhancements to existing products, which may result in unforeseen issues that increase our warranty costs. While such expenses have historically been within expectations, we cannot guarantee this will continue in the future.

Goodwill Impairment

Goodwill represents the excess cost of a business acquisition over the fair value of the net assets acquired. We do not amortize goodwill; however, we perform an annual review each year, or more frequently if indicators of potential impairment exist, to determine if the carrying value of the recorded goodwill or indefinite lived intangible assets is impaired. We evaluate goodwill for impairment annually as of October 1, or when an indicator of impairment exists. If an asset is impaired, the difference between the carrying value of the asset reflected in the financial statements and its current fair value is recognized as an expense in the period in which the impairment occurs.

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Each period, and for any of our reporting units, we can elect to perform a qualitative assessment to determine whether it is necessary to perform the two-step quantitative goodwill impairment test. If we believe, as a result of our qualitative assessment, that it is not more likely than not that the fair value of a reporting unit containing goodwill is less than its carrying amount, then the first and second steps of the quantitative goodwill impairment test are unnecessary. If we elect to bypass the qualitative assessment option, or if the qualitative assessment was performed and resulted in the Company being unable to conclude that it is not more likely than not that the fair value of a reporting unit containing goodwill is greater than its carrying amount, we will perform the two-step quantitative goodwill impairment test. We perform the first step of the two-step quantitative goodwill impairment test by calculating the fair value of the reporting unit using a discounted cash flow method and market approach method, and then comparing the respective fair value with the carrying amount of the reporting unit. If the carrying amount of the reporting unit exceeds its fair value, we perform the second step of the quantitative goodwill impairment test to measure the amount of the impairment loss, if any. Management has concluded there was no goodwill impairment for the years ended December 31, 2018, 2017, and 2016.

Business Combinations

We allocate the fair value of purchase consideration to the assets acquired and liabilities assumed based on their fair values at the acquisition date. The excess of the fair value of purchase consideration over the fair value of the assets acquired and liabilities assumed is recorded as goodwill. When determining the fair values of assets acquired and liabilities assumed, management makes significant estimates and assumptions, especially with respect to intangible assets. Critical estimates in valuing intangible assets include, but are not limited to, expected future cash flows, which include consideration of future growth rates and margins, customer attrition rates, future changes in technology and brand awareness, loyalty and position, and discount rates. Fair value estimates are based on the assumptions management believes a market participant would use in pricing the asset or liability. Amounts recorded in a business combination may change during the measurement period, which is a period not to exceed one year from the date of acquisition, as additional information about conditions existing at the acquisition date becomes available.

Stock-Based Compensation

We measure and record compensation expense using the applicable accounting guidance for share-based payments related to stock options, restricted stock, and performance-based awards granted to our directors and employees. The fair value of stock options, including performance awards, without a market condition is determined by using the Black-Scholes option valuation model. The fair value of restricted stock awards and stock options with a market condition is estimated, at the date of grant, using the Monte Carlo Simulation valuation model. The Black-Scholes and Monte Carlo Simulation valuation models incorporate assumptions as to stock price volatility, the expected life of options or awards, a risk-free interest rate and dividend yield. In valuing our stock options, significant judgment is required in determining the expected volatility of our common stock and the expected life that individuals will hold their stock options prior to exercising. Expected volatility for stock options is based on the historical and implied volatility of our own common stock while the volatility for our restricted stock units with a market condition is based on the historical volatility of our own stock and the stock of companies within our defined peer group. The expected life of stock options is derived from the historical actual term of option grants and an estimate of future exercises during the remaining contractual period of the option. While volatility and estimated life are assumptions that do not bear the risk of change subsequent to the grant date of stock options, these assumptions may be difficult to measure as they represent future expectations based on historical experience. Further, our expected volatility and expected life may change in the future, which could substantially change the grant-date fair value of future awards of stock options and, ultimately, the expense we record. The fair value of restricted stock, including performance awards, without a market condition is estimated using the current market price of our common stock on the date of grant. To the extent of which forfeitures occur, such amounts are recorded as a cumulative adjustment to the previously recorded amounts. We expense stock-based compensation for stock options, restricted stock awards, and performance awards over the requisite service period. For awards with only a service condition, we expense stock-based compensation using the straight-line method over the requisite service period for the entire award. For awards with both performance and service conditions, we expense the stock-based compensation on a straight-line basis over the requisite service period for each separately vesting portion of the award, taking into account the probability that we will satisfy the

performance condition. Furthermore, we expense awards with a market condition over the three-year vesting period regardless of the value that the award recipients ultimately receive.

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Also, beginning in October 2018, our non-employee directors may elect to have their annual cash retainers and annual equity retainers paid in the form of deferred stock units pursuant to the 2014 Equity Incentive Plan and the 2018 Non-Employee Director Deferred Compensation Plan. Each deferred stock unit represents the right to receive one share of our common stock upon the non-employee director's separation of service from the Company. We record compensation cost associated with our deferred stock units over the period of service.

Impact of Recently Adopted Accounting Standards

In January 2017, the FASB issued Accounting Standards Update ("ASU") No. 2017-01, *Business Combinations (Topic 805): Clarifying the Definition of a Business* ("ASU 2017-01") in order to clarify the definition of a business and provide additional guidance to assist entities with evaluating whether transactions should be accounted for as acquisitions (or disposals) of assets or businesses. FASB ASC Topic 805 recognized three elements of a business: inputs, processes, and outputs. While an integrated set of assets and activities (collectively referred to as a "set") that is a business usually has outputs, outputs are not required to be present. Additionally, all the inputs and processes that a seller used in operating a set were not required if market participants could acquire the set and continue to produce outputs. ASU 2017-01 provides a screen to determine when a set is not a business. The screen requires that when substantially all of the fair value of the gross assets acquired (or disposed of) is concentrated in a single identifiable asset or a group of similar identifiable assets, the set is not a business. If the screen is not met, the new guidance (1) requires that to be considered a business, a set must include, at a minimum, an input and a substantive process that together significantly contribute to the ability to create output and (2) removes the evaluation of whether a market participant could replace missing elements. The new guidance provides a framework to assist entities in evaluating whether both an input and a substantive process are present. This framework includes two sets of criteria to consider that depend on whether a set has outputs. Although outputs are not required for a set to be a business, outputs generally are a key element of a business. ASU 2017-01 provides more stringent criteria for sets without outputs and more narrowly defines the term output. ASU 2017-01 became effective for us on January 1, 2018 and was applied prospectively. Our adoption of the new guidance did not have a material impact on our consolidated financial statements.

In October 2016, the FASB issued ASU No. 2016-16, *Income Taxes (Topic 740): Intra-Entity Transfers of Assets Other than Inventory* ("ASU 2016-16"), which removes the prohibition in FASB ASC Topic 740 against the immediate recognition of the current and deferred income tax effects of intra-entity transfers of assets other than inventory. This ASU requires the tax effects of intercompany transactions, other than sales of inventory, to be recognized when the transfer occurs, instead of deferred until the transferred asset is sold to a third party or otherwise recovered through use of the asset. The new guidance must be applied on a modified retrospective basis through a cumulative-effect adjustment directly to retained earnings as of the beginning of the period of adoption. ASU 2016-16 became effective for us on January 1, 2018 and was applied on a modified retrospective basis. Our adoption of the new guidance did not have a material impact on our consolidated financial statements.

In August 2016, the FASB issued ASU No. 2016-15, *Statement of Cash Flows (Topic 230): Classification of Certain Cash Receipts and Cash Payments* ("ASU 2016-15"), which clarifies how companies present and classify certain cash receipts and cash payments in the statement of cash flows. ASU 2016-15 became effective for us on January 1, 2018 and was applied on a modified retrospective basis. Our adoption of the new guidance did not have a material impact on our consolidated financial statements.

In May 2014, the FASB issued ASU No. 2014-09, *Revenue from Contracts with Customers: (Topic 606)* ("ASU 2014-09"), amending its accounting guidance related to revenue recognition. Under this ASU and subsequently issued amendments, revenue is recognized to depict the transfer of goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. Additional disclosures are required to provide the nature, amount, timing and uncertainty of revenue and cash flows arising from customer contracts, including significant judgments and changes in judgments and assets recognized from costs incurred to obtain or fulfill a contract. The following is a summary of impacts by significant revenue stream:

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• Measurement equipment and related software: Under the prior accounting guidance, FASB ASC Topic 605, which is applicable to reporting periods before January 1, 2018, sales of measurement and imaging equipment and related software sales were generally recognized upon shipment, as we considered the earnings process complete as of the shipping date. The related software sold with our measurement and imaging equipment functions together with such equipment to deliver the tangible product's essential functionality. Further, customers frequently purchase extended warranties with the purchase of measurement equipment and related software. Under the new adopted guidance, FASB ASC Topic 606, which is applicable to reporting periods beginning on or after January 1, 2018, we allocate the contract price to performance obligations based on our best estimate of the standalone selling price. We make this allocation estimate utilizing data from the sale of our applicable products and services to customers separately in similar circumstances, with the exception of software licenses. With respect to software licenses, we use the residual method for allocating the contract price to performance obligations relating to software licenses. Revenue related to our measurement and imaging equipment and related software is generally recognized upon shipment from our facilities or when delivered to the customer location, as determined by the agreed upon shipping terms, at which time we are entitled to payment and title and control has passed to the customer. Our adoption of the new guidance did not result in material changes to our accounting for revenue related to our measurement and imaging equipment and related software.

• Extended warranties: Under the prior accounting guidance, FASB ASC Topic 605, which is applicable to reporting periods before January 1, 2018, extended warranty sales were recognized on a straight-line basis over the term of the warranty. Extended warranty sales include contract periods that extend between one month and three years. The unearned service revenues reported in current and noncurrent liabilities on our consolidated balance sheets appropriately reflect the remaining performance obligations related to these contracts. Our adoption of the new guidance, FASB ASC Topic 606, which is applicable to reporting periods beginning on or after January 1, 2018, did not result in material changes to our accounting for revenue related to extended warranties.

• Software: Under the prior accounting guidance, FASB ASC Topic 605, which is applicable to reporting periods before January 1, 2018, software-only sales were recognized when no further significant production, modification or customization of the software was required and when the following criteria were met: persuasive evidence of a sales agreement existed, delivery had occurred, and the sales price was fixed or determinable and deemed collectible. These software arrangements generally include short-term maintenance that is considered post-contract support. Maintenance renewals, when sold, were recognized on a straight-line basis over the term of the maintenance agreement. Our adoption of the new guidance, FASB ASC Topic 606, which is applicable to reporting periods beginning on or after January 1, 2018, did not result in material changes to our accounting for revenue related to software-only sales and maintenance renewals.

The unearned service revenue liabilities reported on our consolidated balance sheets reflect the contract liabilities to satisfy the remaining performance obligations for extended warranties and software maintenance. The current portion of unearned service revenues on our consolidated balance sheets is what we expect to recognize to revenue within twelve months after the applicable balance sheet date relating to extended warranty and software maintenance contract liabilities. The Unearned service revenues - less current portion on our consolidated balance sheets is what we expect to recognize to revenue extending beyond twelve months after the applicable balance sheet date relating to extended warranty and software maintenance contract liabilities. Customer deposits on our consolidated balance sheets represent customer prepayments on contracts for performance obligations that we must satisfy in the future to recognize the related contract revenue. These amounts are generally related to performance obligations which are delivered in less than 12 months. During the year ended December 31, 2018, we recognized $25.0 million of service revenue that was deferred on our consolidated balance sheet as of December 31, 2017.

Under the prior accounting guidance, FASB ASC Topic 605, which is applicable to reporting periods before January 1, 2018, we recognized sales commission expense as incurred. Under the new guidance, FASB ASC Topic 606, which is applicable to reporting periods beginning on or after January 1, 2018, we must capitalize the commission expense and amortize such costs ratably over the term of the contract. In accordance with the practical expedient and modified retrospective method of adoption, we recorded a net increase to opening retained earnings as of January 1, 2018 of $1.8 million and recognized an associated $2.4 million deferred cost asset due to the cumulative impact of adopting

the new guidance. As of December 31, 2018, the deferred cost asset related to deferred commissions was approximately $2.7 million. For classification purposes, $1.8 million and $0.9 million are comprised within the Prepaid expenses and other current assets and Other long-term assets, respectively, on our consolidated balance sheet as of December 31, 2018.

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We have elected the practical expedient to account for shipping and handling as activities to fulfill the promise to transfer the good. As such, shipping and handling fees billed to customers in a sales transaction are recorded in Product Sales and shipping and handling costs incurred are recorded in Cost of Sales. Additionally, we have elected the practical expedient to exclude from Sales any value added, sales and other taxes that we collect concurrently with revenue-producing activities. These accounting policy elections are consistent with the manner in which we have historically recorded shipping and handling fees and taxes.

The nature of certain of our contracts gives rise to variable consideration, which may be constrained, primarily related to an allowance for sales returns. In accordance with the adoption of the new guidance, we are required to estimate the contract asset related to sales returns and record a corresponding adjustment to Cost of Sales. Historically, our allowance for sales returns has not been material and was approximately $0.1 million as of December 31, 2018. As such, our adoption of the new guidance did not result in material changes to our accounting for variable consideration related to sales returns, and the corresponding contract asset related to such returns. See Note 3 to the "Notes to Consolidated Financial Statements" included in Part II, Item 8 of this Annual Report on Form 10-K for further information.

Impact of Recently Issued Accounting Standards

In January 2017, the FASB issued ASU No. 2017-04, *Intangible - Goodwill and Other (Topic 350): Simplifying the Test for Goodwill Impairment* ("ASU 2017-04"), which is intended to simplify the subsequent measurement of goodwill by eliminating Step 2 from the goodwill impairment test. Under the current guidance, performance of Step 2 requires us to calculate the implied fair value of goodwill by following procedures that would be required to determine the fair value of assets acquired and liabilities assumed in a business combination. Under the new guidance, we will perform our goodwill impairment test by comparing the fair value of a reporting unit with its carrying amount. An impairment charge will be recognized for the amount by which the carrying amount exceeds the reporting unit's fair value up to the amount of the goodwill allocated to the reporting unit. The new guidance also eliminates the requirements for any reporting unit with a zero or negative carrying amount to perform Step 2 of the goodwill impairment test if it fails the qualitative assessment. As a result, all reporting units will be subject to the same impairment assessment. We will still have the option to perform the qualitative assessment for a reporting unit to determine if the quantitative impairment test is necessary. ASU 2017-04 becomes effective for annual or any interim goodwill impairment tests in fiscal years beginning after December 15, 2019, with early adoption permitted for annual or any interim goodwill impairment tests after January 1, 2017. The amendments in this ASU will be applied on a prospective basis. Disclosure of the nature and reason for the change in accounting principle is required upon transition. This disclosure is required in the first annual period and in the interim period within the first annual period when we initially adopt the amendments in this ASU. We plan to adopt this guidance for our fiscal year ending December 31, 2020. We do not expect that the adoption of this guidance will have a material impact on our consolidated financial statements.

In February 2016, the FASB issued ASU 2016-02, *Leases (Topic 842)* ("ASU 2016-02"), which is intended to increase transparency and comparability among organizations by recognizing lease assets and lease liabilities on the balance sheet and disclosing key information about leasing arrangements to enable users of financial statements to assess the amount, timing and uncertainty of cash flows arising from leases. ASU 2018-11, *Lease Topic 842: Targeted Improvements*, was issued by the FASB in July 2018 and allows for a cumulative-effect adjustment transition method of adoption. The new guidance is effective for fiscal years beginning after December 15, 2018 and interim periods within those years. We plan to adopt ASU 2016-02 in the first quarter of 2019 with a cumulative-effect adjustment made on January 1, 2019. We are in the process of calculating the impact of adoption of this ASU on our consolidated financial statements, and are currently finalizing the implementation of a lease management software to assist in this task. We believe the most significant changes will be related to the recognition of new right-of-use assets and lease liabilities on our balance sheet for operating leases where we function as a lessee. We estimate the impact of the adoption of ASU 2016-02 will be between a $14 million to $17 million increase in right-of use assets and lease liabilities. We plan to elect certain practical expedients available under the transition provisions to (i) allow aggregation of non-lease components with the related lease components when evaluating accounting treatment, (ii) apply the modified retrospective adoption method, utilizing the simplified transition option, which allows entities to

continue to apply the legacy guidance in FASB ASC Topic 840, including its disclosure requirements, in the comparative periods presented in the year of adoption, and (iii) use hindsight in determining the lease term (that is, when considering lessee options to extend or terminate the lease and to purchase the underlying asset) and in assessing impairment of the entity's right-of-use assets. The adoption of ASU 2016-02 will also require any initial direct costs, which are incremental costs that would not have been incurred had the lease not been obtained, to be included in the right-of-use assets. We do not expect the recognition of these costs upon adoption to have a material impact on the right-of-use assets or on our consolidated financial statements.

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ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

Foreign Exchange Exposure

We conduct a significant portion of our business outside the United States. In 2018, 61% of our revenue was invoiced, and a significant portion of our operating expenses were paid, in foreign currencies. At December 31, 2018, 52% of our assets were denominated in foreign currencies. Fluctuations in exchange rates between the U.S. dollar and such foreign currencies may have a material adverse effect on our results of operations and financial condition and could specifically result in foreign exchange gains and losses. The impact of future exchange rate fluctuations on the results of our operations cannot be accurately predicted due to the constantly changing exposure to various currencies, the fact that all foreign currencies do not react in the same manner in relation to the U.S. dollar and the number of currencies involved, although our most significant exposures are to the Euro, Swiss franc, Japanese yen, and Brazilian real. To the extent that the percentage of our non-U.S. dollar revenues derived from international sales increases in the future, our exposure to risks associated with fluctuations in foreign exchange rates may increase. We are aware of the availability of off-balance sheet financial instruments to hedge exposure to foreign currency exchange rates, including cross-currency swaps, forward contracts and foreign currency options. However, we have not used such instruments in the past, and none were utilized in 2018, 2017 or 2016.

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ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

Board of Directors and Shareholders
FARO Technologies, Inc.

Opinion on the financial statements

We have audited the accompanying consolidated balance sheets of FARO Technologies, Inc. (a Florida corporation) and subsidiaries (the "Company") as of December 31, 2018 and 2017, the related consolidated statements of operations, comprehensive income (loss), shareholders' equity, and cash flows for each of the three years in the period ended December 31, 2018, and the related notes (collectively referred to as the "financial statements"). In our opinion, the financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2018 and 2017, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2018, in conformity with accounting principles generally accepted in the United States of America.
We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) ("PCAOB"), the Company's internal control over financial reporting as of December 31, 2018, based on criteria established in the 2013 *Internal Control-Integrated Framework* issued by the Committee of Sponsoring Organizations of the Treadway Commission ("COSO"), and our report dated February 20, 2019 expressed an unqualified opinion.

Basis for opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.
We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ GRANT THORNTON LLP

We have served as the Company's auditor since 2004.

Orlando, Florida
February 20, 2019

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FARO TECHNOLOGIES, INC. AND SUBSIDIARIES
CONSOLIDATED BALANCE SHEETS

(in thousands, except share and per share data)	December 31, 2018	December 31, 2017
ASSETS		
Current assets:		
Cash and cash equivalents	$108,783	$140,960
Short-term investments	24,793	10,997
Accounts receivable, net	88,927	72,105
Inventories, net	65,444	53,786
Prepaid expenses and other current assets	28,795	16,311
Total current assets	316,742	294,159
Property and equipment:		
Machinery and equipment	76,048	66,514
Furniture and fixtures	6,749	6,945
Leasehold improvements	20,304	19,872
Property and equipment at cost	103,101	93,331
Less: accumulated depreciation and amortization	(72,684)	(61,452)
Property and equipment, net	30,417	31,879
Goodwill	67,274	52,750
Intangible assets, net	33,054	22,540
Service and sales demonstration inventory, net	39,563	39,614
Deferred income tax assets, net	14,719	15,606
Other long-term assets	4,475	2,030
Total assets	$506,244	$458,578
LIABILITIES AND SHAREHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	$20,093	$11,569
Accrued liabilities	36,327	27,362
Income taxes payable	5,081	4,676
Current portion of unearned service revenues	32,878	29,674
Customer deposits	3,144	2,604
Total current liabilities	97,523	75,885
Unearned service revenues - less current portion	15,505	11,815
Deferred income tax liabilities	736	695
Income taxes payable - less current portion	12,247	15,952
Other long-term liabilities	3,624	2,165
Total liabilities	129,635	106,512
Commitments and contingencies - See Note 13		
Shareholders' equity:		
Preferred stock - par value $0.01, 10,000,000 shares authorized; none issued	—	—
Common stock - par value $.001, 50,000,000 shares authorized; 18,676,059 and 18,277,142 issued; 17,253,011 and 16,796,884 outstanding, respectively	19	18
Additional paid-in capital	251,329	223,055
Retained earnings	175,353	168,624
Accumulated other comprehensive loss	(18,483)	(7,822)
Common stock in treasury, at cost - 1,423,048 shares and 1,480,258, respectively	(31,609)	(31,809)
Total shareholders' equity	376,609	352,066
Total liabilities and shareholders' equity	$506,244	$458,578

The accompanying notes are an integral part of these consolidated financial statements.

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FARO TECHNOLOGIES, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF OPERATIONS

(in thousands, except share and per share data)	Years ended December 31, 2018	2017	2016
SALES			
Product	$311,102	$277,922	$256,010
Service	92,525	82,995	69,574
Total sales	403,627	360,917	325,584
COST OF SALES			
Product	124,802	110,143	107,965
Service	50,480	46,137	39,659
Total cost of sales (exclusive of depreciation and amortization, shown separately below)	175,282	156,280	147,624
GROSS PROFIT	228,345	204,637	177,960
OPERATING EXPENSES			
Selling and marketing	116,920	103,544	79,870
General and administrative	47,652	43,807	40,813
Depreciation and amortization	18,313	16,588	13,868
Research and development	39,706	35,376	30,125
Total operating expenses	222,591	199,315	1164,676
INCOME FROM OPERATIONS	5,754	5,322	13,284
OTHER EXPENSE (INCOME)			
Interest income	(429)	(319)	(212)
Other expense (income), net	1,139	(190)	822
Interest expense	486	4	48
INCOME BEFORE INCOME TAX (BENEFIT) EXPENSE	4,558	5,827	12,626
INCOME TAX (BENEFIT) EXPENSE	(372)	20,343	1,519
NET INCOME (LOSS)	$4,930	$(14,516)	$11,107
NET INCOME (LOSS) PER SHARE - BASIC	$0.29	$(0.87)	$0.67
NET INCOME (LOSS) PER SHARE - DILUTED	$0.29	$(0.87)	$0.67
Weighted average shares - Basic	17,043,167	16,711,534	16,654,786
Weighted average shares - Diluted	17,348,456	16,711,534	16,681,710

The accompanying notes are an integral part of these consolidated financial statements.

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FARO TECHNOLOGIES, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF COMPREHENSIVE (LOSS) INCOME

	Years ended December 31,		
(in thousands)	2018	2017	2016
Net income (loss)	$4,930	$(14,516)	$11,107
Currency translation adjustments	(10,661)	16,739	(4,700)
Comprehensive (loss) income	$(5,731)	$2,223	$6,407

The accompanying notes are an integral part of these consolidated financial statements.

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FARO TECHNOLOGIES, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF SHAREHOLDERS' EQUITY
FOR THE YEARS ENDED DECEMBER 31, 2018, 2017, AND 2016

(in thousands, except share data)	Common Stock Shares	Common Stock Amounts	Additional Paid-in Capital	Retained Earnings	Accumulated Other Comprehensive Income (Loss)	Common Stock in Treasury	Total
BALANCE JANUARY 1, 2016	16,588,118	$ 18	$206,996	$172,329	$ (19,861)	$(31,838)	$327,644
Net income				11,107			11,107
Currency translation adjustment, net of income tax					(4,700)		(4,700)
Restricted stock issued and stock based compensation under incentive plans	20,925		5,374				5,374
Stock options exercised	71,748		674				674
Tax impact from restricted stock and stock options			(442)				(442)
BALANCE DECEMBER 31, 2016	16,680,791	$ 18	$212,602	$183,436	$ (24,561)	$(31,838)	$339,657
Net loss				(14,516)			(14,516)
Currency translation adjustment, net of income tax					16,739		16,739
Restricted stock issued and stock based compensation under incentive plans	19,881		6,450				6,450
Stock options exercised, net of shares withheld for employee taxes	86,994		3,284				3,284
Reissuance of treasury shares	9,218		281			29	310
Cumulative effect of the adoption of ASU 2016-09			438	$(296)			142
BALANCE DECEMBER 31, 2017	16,796,884	$ 18	$223,055	$168,624	$ (7,822)	$(31,809)	$352,066
Net income				4,930			4,930
Currency translation adjustment, net of income tax					(10,661)		(10,661)
Restricted stock issued and stock based compensation under incentive plans	15,960		7,620				7,620
Stock options exercised, net of shares withheld for employee taxes	382,957	1	17,027				17,028
Reissuance of treasury shares	57,210		3,627			200	3,827
Cumulative effect of the adoption of ASU 2014-09				1,799			1,799
BALANCE DECEMBER 31, 2018	17,253,011	$ 19	$251,329	$175,353	$ (18,483)	$(31,609)	$376,609

The accompanying notes are an integral part of these consolidated financial statements.

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FARO TECHNOLOGIES, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF CASH FLOWS

(in thousands)	Years Ended December 31, 2018	2017	2016
CASH FLOWS FROM:			
OPERATING ACTIVITIES:			
Net income (loss)	$4,930	$(14,516)	$11,107
Adjustments to reconcile net income (loss) to net cash provided by operating activities:			
Depreciation and amortization	18,313	16,588	13,868
Compensation for stock options and restricted stock units	7,620	6,450	5,374
Provision for bad debts	907	370	898
Loss on disposal of assets	192	451	860
Provision for excess and obsolete inventory	5,757	1,734	4,134
Deferred income tax benefit	689	(1,740)	(2,002)
Income tax benefit from exercise of stock options	—	—	(357)
Change in operating assets and liabilities:			
(Increase) decrease in:			
Accounts receivable, net	(15,995)	(6,766)	6,727
Inventories	(20,532)	(10,926)	(6,729)
Prepaid expenses and other assets	(11,310)	(253)	3,588
Increase (decrease) in:			
Accounts payable and accrued liabilities	11,195	1,103	534
Income taxes payable	(3,286)	20,011	618
Customer deposits	513	(461)	(1,310)
Unearned service revenues	7,330	(1,690)	273
Net cash provided by operating activities	6,323	10,355	37,583
INVESTING ACTIVITIES:			
(Purchases of) Proceeds from sale of investments	(14,000)	32,000	—
Purchases of property and equipment	(11,021)	(8,970)	(7,720)
Payments for intangible assets	(1,900)	(2,377)	(1,657)
Acquisition of business, net of cash received	(27,067)	(5,596)	(27,708)
Equity investments	(1,786)	—	—
Net cash (used in) provided by investing activities	(55,774)	15,057	(37,085)
FINANCING ACTIVITIES:			
Payments on capital leases	(157)	(108)	(8)
Payments of contingent consideration for acquisitions	(888)	(521)	(774)
Income tax benefit from exercise of stock options	—	—	357
Proceeds from issuance of stock related to stock option exercises	20,855	3,594	674
Net cash provided by financing activities	19,810	2,965	249
EFFECT OF EXCHANGE RATE CHANGES ON CASH AND CASH EQUIVALENTS	(2,536)	6,414	(1,934)
(DECREASE) INCREASE IN CASH AND CASH EQUIVALENTS	(32,177)	34,791	(1,187)
CASH AND CASH EQUIVALENTS, BEGINNING OF YEAR	140,960	106,169	107,356
CASH AND CASH EQUIVALENTS, END OF YEAR	$108,783	$140,960	$106,169

The accompanying notes are an integral part of these consolidated financial statements.

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FARO TECHNOLOGIES, INC. AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
YEARS ENDED DECEMBER 31, 2018, 2017 and 2016
(in thousands, except share and per share data or as otherwise noted)

1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Description of Business—FARO Technologies, Inc. and its subsidiaries (collectively "FARO," the "Company," "us," "we" or "our") design, develop, manufacture, market and support software driven, three-dimensional ("3D") measurement and imaging solutions. This technology permits high-precision 3D measurement, imaging and comparison of parts and complex structures within production and quality assurance processes. Our devices are used for inspection of components and assemblies, rapid prototyping, reverse engineering, documenting large volume or structures in 3D, surveying and construction as well as for investigation and reconstruction of accident sites or crime scenes. We sell the majority of our products through a direct sales force across a broad number of customers in a range of manufacturing, industrial, architecture, surveying, building information modeling, construction, public safety forensics, cultural heritage, dental and other applications. Our FaroArm®, FARO ScanArm®, FARO Laser Tracker™, FARO Cobalt Array Imager, FARO Laser Projector, and their companion CAM2®, BuildIT, and BuildIT Projector software solutions, provide for Computer-Aided Design ("CAD") based inspection, factory-level statistical process control, high-density surveying and laser-guided assembly and production. Together, these products integrate the measurement, quality inspection, and reverse engineering functions with CAD and 3D software to improve productivity, enhance product quality, and decrease rework and scrap in the manufacturing process, mainly supporting applications in our 3D Manufacturing (formerly known as "Factory Metrology" and "3D Factory") vertical. Our FARO Focus, FARO ScanPlan and FARO Scanner Freestyle^{3D} X laser scanners, and their companion FARO SCENE, BuildIT, FARO As-Built™, and FARO Zone public safety forensics software offerings, are utilized for a wide variety of 3D modeling, documentation and high-density surveying applications in our Construction Building Information Modeling ("Construction BIM," formerly known as "Construction BIM-CIM") and Public Safety Forensics verticals. Our FARO ScanArm®, FARO Cobalt Array Imager, FARO Scanner Freestyle^{3D} X laser scanners and their companion SCENE software, and other 3D structured light scanning solutions specific to the dental industry, also enable a fully digital workflow used to capture real world geometry for the purpose of empowering design, enabling innovation, and speeding up the design cycle, supporting our 3D Design (formerly known as "Product Design") vertical. Our line of galvanometer-based scan heads and laser scan controllers are used in a variety of laser applications and are integrated into larger components and systems, supporting our Photonics vertical.

Reporting Segments—In 2016, we evaluated our reporting segment structure based on our new management organization and the changes implemented in connection with our initiatives to reorganize our business around certain vertical markets. We report our segment information in accordance with the provisions of Financial Accounting Standards Board ("FASB") Accounting Standards Codification ("ASC") Topic 280, *Segment Reporting* ("FASB ASC Topic 280"). We evaluate business performance based upon several metrics, using revenue growth and segment profit as the primary financial measures. During 2018, the following changes were made to our verticals and reporting segments:

- In the first quarter of 2018, we combined our historical Factory Metrology and 3D Machine Vision verticals under a single reporting segment, 3D Factory, which replaced our Factory Metrology reporting segment, due to the linkage between the two historical verticals related to the type or class of customers served, the nature of the products and services provided, and the nature of the production processes. The 3D Machine Vision vertical was previously reported in our Other reporting segment.
- In the first quarter of 2018, we renamed our Construction BIM-CIM vertical and reporting segment "Construction BIM."
- In the first quarter of 2018, we renamed our Other reporting segment "Emerging Verticals."
- In the third quarter of 2018, we merged the historical Factory Metrology and 3D Machine Vision verticals into one vertical named "3D Factory" for greater consistency with our realigned reporting segments.

In the third quarter of 2018, we segregated the operations of our acquisitions of Laser Control Systems Limited ("Laser Control Systems") and Lanmark Controls, Inc. ("Lanmark"), along with the operations resulting from our acquisition of substantially all of the assets of Instrument Associates, LLC d/b/a Nutfield Technology ("Nutfield"), into a vertical that we named "Photonics." The creation of this vertical enables us to better focus on our product range directed at laser steering. These operations were historically reported in the 3D Factory reporting segment in the first six months of 2018 and the historical Factory Metrology reporting segment in 2017 and are now included in the Emerging Verticals (formerly known as "Other") reporting segment. Due to this change, we performed a qualitative goodwill impairment analysis in the third quarter of 2018, and management concluded there was no goodwill impairment at the time of this vertical reporting change.

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- In the third quarter of 2018, we renamed our Product Design vertical "3D Design."
- In the fourth quarter of 2018, we renamed our 3D Factory vertical and reporting segment "3D Manufacturing."

There were no changes in our total consolidated financial condition or results of operations previously reported as a result of the changes in our verticals and reporting segments. The amounts related to our reporting segment information for the year ended December 31, 2017 have been restated throughout this Annual Report on Form 10-K to reflect the above changes in our reporting segments. The amounts related to our reporting segment information for the year ended December 31, 2016 were restated but were not impacted by the above changes in our reporting segments.

Each of our reporting segments continue to employ consistent accounting policies. As a result of our assessments of our reporting segments, we now report our activities in the following three reporting segments:

- The 3D Manufacturing reporting segment contains solely our 3D Manufacturing vertical, which provides both standardized and customized solutions for 3D measurement and inspection in an industrial or manufacturing environment. Applications include alignment, part inspection, dimensional analysis, first article inspection, incoming and in-process inspection, machine calibration, non-contact inspection, robot calibration, tool building and set-up, and assembly guidance.
- The Construction BIM reporting segment contains solely our Construction BIM vertical and provides solutions for as-built data capturing and 3D visualization in building information modeling applications, allowing our customers in our architecture, engineering and construction markets to quickly and accurately extract two-dimensional ("2D") and 3D measurement points. Applications include as-built documentation, construction monitoring, surveying, asset and facility management, and heritage preservation.
- The Emerging Verticals reporting segment includes our 3D Design, Public Safety Forensics and Photonics verticals. Our 3D Design vertical provides advanced 3D solutions to capture and edit 3D shapes of products, people, and/or environments for design purposes in product development, computer graphics, and dental and medical applications. Our Public Safety Forensics vertical provides solutions to public safety officials and professionals to capture environmental or situational scenes in 2D and 3D for crime, crash and fire scene investigations and environmental safety evaluations. Our Photonics vertical develops and markets galvanometer-based laser measurement products and solutions.

All operating segments that do not meet the criteria to be reporting segments are aggregated in the Emerging Verticals reporting segment and have been combined based on the aggregation criteria and quantitative thresholds in accordance with the provisions of FASB ASC Topic 280. Our reporting segments have been determined in accordance with our internal management structure, which is based on operating activities. Each segment is responsible for its own product management, sales, strategy and profitability.

See Note 18, "Segment Reporting" for further information.

Principles of Consolidation—Our consolidated financial statements include the accounts of FARO Technologies, Inc. and its subsidiaries, all of which are wholly owned. All intercompany transactions and balances have been eliminated. The financial statements of our foreign subsidiaries are translated into U.S. dollars using exchange rates in effect at period-end for assets and liabilities and average exchange rates during each reporting period for results of operations. Adjustments resulting from financial statement translations are reflected as a separate component of accumulated other comprehensive loss. Foreign currency transaction gains and losses are included in net income (loss).

Variable Interest Entity—We do not invest in any investees over which we exert significant influence or have effective control. As such, our investee is currently accounted for using the equity method of accounting. Our equity in the net income (loss) from our equity method investment is recorded as income (loss) with a corresponding increase (decrease) in the investment. Distributions received from the equity investee reduce the investment. Distributions from the equity investee representing our share of the equity investee's earnings are treated as cash proceeds from operations, while distributions in excess of the equity investee's earnings are considered a return of capital and treated as cash proceeds from investing activities in our consolidated statements of cash flows.

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Revenue Recognition, Product Warranty and Extended Warranty Contracts—Revenue is recognized as performance obligations within a contract are satisfied in an amount that reflects the consideration we expect to receive in exchange for satisfaction of those performance obligations, or standalone selling price. Our contracts with customers may include multiple performance obligations. For such arrangements, we allocate revenues to each performance obligation based on its relative standalone selling price. We make this allocation estimate utilizing data from the sale of our applicable products and services to customers separately in similar circumstances, with the exception of software licenses. With respect to software licenses, we use the residual method for allocating the contract price to performance obligations relating to software licenses. Revenue related to our measurement and imaging equipment and related software is generally recognized upon shipment from our facilities or when delivered to the customer location, as determined by the agreed upon shipping terms, at which time we are entitled to payment and title and control has passed to the customer. Fees billed to customers associated with the distribution of products are classified as revenue. We warrant our products against defects in design, materials and workmanship for one year. A provision for estimated future costs relating to warranty expense is recorded when products are shipped. We separately sell extended warranties. Extended warranty revenues are recognized on a straight-line basis over the term of the warranty. Costs relating to extended warranties are recognized as incurred. Revenue from sales of software only is recognized when no further significant production, modification or customization of the software is required and when the risks and rewards of ownership have passed to the customer. These software arrangements generally include short-term maintenance that is considered post-contract support ("PCS"), which is considered to be a separate performance obligation. We generally establish standalone sales price for this PCS component based on our maintenance renewal rate. Maintenance renewals, when sold, are recognized on a straight-line basis over the term of the maintenance agreement. Revenues resulting from sales of comprehensive support, training and technology consulting services are recognized as such services are performed and are deferred when billed in advance of the performance of services. Payment for products and services is collected within a short period of time following transfer of control or commencement of delivery of services, as applicable. Revenues are presented net of sales-related taxes.

Cash and Cash Equivalents—We consider cash on hand and amounts on deposit with financial institutions with maturities of three months or less when purchased to be cash and cash equivalents. We have deposits with foreign banks totaling $77.5 million and $98.8 million as of December 31, 2018 and 2017, respectively.

Accounts Receivable and Related Allowance for Doubtful Accounts—Credit is extended to customers based on an evaluation of a customer's financial condition and, generally, collateral is not required. Accounts receivable are generally due within 30 to 90 days and are stated at amounts due from customers, net of an allowance for doubtful accounts. Accounts outstanding longer than the contractual payment terms are considered past due. We make judgments as to the collectability of accounts receivable based on historical trends and future expectations. Management estimates an allowance for doubtful accounts, which adjusts gross trade accounts receivable to their net realizable value. The allowance for doubtful accounts is based on an analysis of all receivables for possible impairment issues and historical write-off percentages. We write off accounts receivable when they become uncollectible, and payments subsequently received on such receivables are credited to the allowance for doubtful accounts. We do not generally charge interest on past due receivables.

Inventories—Inventories are stated at the lower of cost or net realizable value using the first-in first-out ("FIFO") method. Shipping and handling costs are classified as a component of cost of sales in the consolidated statements of operations. Sales demonstration inventory is comprised of measuring and imaging devices utilized by sales representatives to present our products to customers. Management expects sales demonstration inventory to be held by our sales representatives for up to three years, at which time it is refurbished and transferred to finished goods as used equipment, stated at the lower of cost or net realizable value. Management expects these refurbished units to remain in finished goods inventory and be sold within 12 months at prices that produce reduced gross margins. Sales demonstration inventory remains classified as inventory, as it is available for sale and any required refurbishment prior to sale is minimal.

Service inventory is typically used to provide a temporary replacement product to a customer covered by a premium warranty when the customer's unit requires service or repair and as training equipment. Service inventory is available for sale; however, management does not expect service inventory to be sold within 12 months and, as such, classifies

this inventory as a long-term asset. Service inventory that we utilize for training or repairs which we deem as no longer available for sale is transferred to fixed assets at the lower of cost or net realizable value and depreciated over its remaining useful life, typically three years. See Note 6, “Inventories” for further information regarding inventories.

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Reserve for Excess and Obsolete Inventory—Since the value of inventory that will ultimately be realized cannot be known with exact certainty, we rely upon both past sales history and future sales forecasts to provide a basis for the determination of the reserve. Inventory is considered potentially obsolete if we have withdrawn those products from the market or had no sales of the product for the past 12 months and have no sales forecasted for the next 12 months. Inventory is considered potentially excess if the quantity on hand exceeds 12 months of expected remaining usage. The resulting potentially obsolete and excess parts are then reviewed to determine if a substitute usage or a future need exists. Items without an identified current or future usage are reserved in an amount equal to 100% of the FIFO cost of such inventory. Our products are subject to changes in technologies that may make certain of our products or their components obsolete or less competitive, which may increase our historical provisions to the reserve.

Property and Equipment—Property and equipment purchases exceeding a thousand dollars are capitalized and recorded at cost. Depreciation is computed beginning on the date that the asset is placed into service using the straight-line method over the estimated useful lives of the various classes of assets as follows:

Machinery, equipment and software	2 to 5 years
Furniture and fixtures	3 to 10 years

Leasehold improvements are amortized on a straight-line basis over the lesser of the life of the asset or the remaining term of the lease.

Depreciation expense was $12.9 million, $12.3 million and $10.9 million in 2018, 2017 and 2016, respectively. Accelerated methods of depreciation are used for income tax purposes in contrast to book purposes, and as a result, appropriate provisions are made for the related deferred income taxes.

Business Combinations—We allocate the fair value of purchase consideration to the assets acquired and liabilities assumed based on their fair values at the acquisition date. The excess of the fair value of purchase consideration over the fair value of these assets acquired and liabilities assumed is recorded as goodwill. When determining the fair values of assets acquired and liabilities assumed, management makes significant estimates and assumptions, especially with respect to intangible assets. Critical estimates in valuing intangible assets include, but are not limited to, expected future cash flows, which includes consideration of future growth rates and margins, customer attrition rates, future changes in technology and brand awareness, loyalty and position, and discount rates. Critical estimates are also made in valuing earn-outs, which represent arrangements to pay former owners based on the satisfaction of performance criteria. Fair value estimates are based on the assumptions management believes a market participant would use in pricing the asset or liability. Amounts recorded in a business combination may change during the measurement period, which is a period not to exceed one year from the date of acquisition, as additional information about conditions existing at the acquisition date becomes available.

Goodwill and Intangible Assets—Goodwill represents the excess cost of a business acquisition over the fair value of the net assets acquired. We do not amortize goodwill; however, we perform an annual review each year, or more frequently if indicators of potential impairment exist, to determine if the carrying value of the recorded goodwill or indefinite lived intangible assets is impaired. We evaluate goodwill for impairment annually as of October 1, or when an indicator of impairment exists. If an asset is impaired, the difference between the carrying value of the asset reflected in the financial statements and its current fair value is recognized as an expense in the period in which the impairment occurs. See Note 7, “Goodwill” and Note 8, “Intangible Assets” for further information regarding goodwill and intangible assets, respectively.

Each period, and for any of our reporting units, we can elect to perform a qualitative assessment to determine whether it is necessary to perform the two-step quantitative goodwill impairment test. If we believe, as a result of our qualitative assessment, that it is not more likely than not that the fair value of a reporting unit containing goodwill is less than its carrying amount, then the first and second steps of the quantitative goodwill impairment test are unnecessary. If we elect to bypass the qualitative assessment option, or if the qualitative assessment was performed and resulted in the Company being unable to conclude that it is not more likely than not that the fair value of a reporting unit containing goodwill is greater than its carrying amount, we will perform the two-step quantitative goodwill impairment test. We perform the first step of the two-step quantitative goodwill impairment test by calculating the fair value of the reporting unit using a discounted cash flow method and market approach method, and

then comparing the respective fair value with the carrying amount of the reporting unit. If the carrying amount of the reporting unit exceeds its fair value, we perform the second step of the quantitative goodwill impairment test to measure the amount of the impairment loss, if any. Management has concluded there was no goodwill impairment for the years ended December 31, 2018, 2017, and 2016.

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Other intangible assets principally include patents, existing product technology and customer relationships that arose in connection with our acquisitions. Other intangible assets are recorded at fair value at the date of acquisition and are amortized over their estimated useful lives of 3 to 20 years. As of December 31, 2018 and 2017, there were no indefinite-lived intangible assets.

Product technology and patents are recorded at cost. Amortization expense is computed using the straight-line method over the lives of the product technology and patents of 7 to 20 years.

The remaining weighted-average amortization period for all our intangible assets is eight years.

Long-Lived Assets—Long-lived assets, other than goodwill, are evaluated for impairment when events or changes in business circumstances indicate that the carrying amount of an asset group may not be fully recoverable, comparing projected undiscounted future cash flows to the carrying value of the asset group. Management has concluded that there were no indicators of impairment of these assets during the years ended December 31, 2018, 2017 and 2016.

Research and Development—Research and development costs incurred in the discovery of new knowledge and the resulting translation of this new knowledge into plans and designs for new products prior to the attainment of the related products' technological feasibility are recorded as expenses in the period incurred. To date, the time incurred between the attainment of the related products' technological feasibility and general release to customers has been short.

Reserve for Warranties—We establish at the time of sale a liability for the one-year warranty included with the initial purchase price of our products, based upon an estimate of the repair expenses likely to be incurred for the warranty period. The warranty period is measured in installation-months for each major product group. The warranty reserve is included in accrued liabilities in the accompanying consolidated balance sheets. The warranty expense is estimated by applying the actual total repair expenses for each product group in the prior period and determining a rate of repair expense per installation-month. This repair rate is multiplied by the number of installation-months of warranty for each product group to determine the provision for warranty expenses for the period. We evaluate our exposure to warranty costs at the end of each period using the estimated expense per installation-month for each major product group, the number of units remaining under warranty, and the remaining number of months each unit will be under warranty. We have a history of new product introductions and enhancements to existing products, which may result in unforeseen issues that increase our warranty costs. While such expenses have historically been within expectations, we cannot guarantee this will continue in the future.

Income Taxes—We review our deferred tax assets on a regular basis to evaluate their recoverability based upon expected future reversals of deferred tax assets and liabilities, projections of future taxable income, and tax planning strategies that we might employ to utilize such assets, including net operating loss carryforwards. Based on the positive and negative evidence for recoverability, we establish a valuation allowance against the net deferred tax assets of a taxing jurisdiction in which we operate unless it is "more likely than not" that we will recover such assets through the above means. Our evaluation of the need for the valuation allowance is significantly influenced by our ability to maintain profitability and our ability to predict and achieve future projections of taxable income.

We recognize tax benefits related to uncertain tax positions only if it is more likely than not that the tax position will be sustained upon examination by taxing authorities. For those positions where it is not more likely than not that a tax benefit will be sustained, no tax benefit has been recognized in the financial statements. In the ordinary course of business, we are examined by various federal, state, and foreign tax authorities. We regularly assess the potential outcomes of these examinations and any future examinations for the current or prior years in determining the adequacy of our provision for income taxes. See Note 12, "Income Taxes" for further information regarding income taxes.

Earnings (Loss) Per Share ("EPS")—Basic earnings (loss) per share is computed by dividing net income (loss) by the weighted average number of shares outstanding. Diluted earnings per share is computed by also considering the impact of potential common stock on both net income and the weighted average number of shares outstanding. Our potential common stock consists of employee stock options, restricted stock, restricted stock units and performance-based awards. Our potential common stock is excluded from the basic earnings per share calculation and

is included in the diluted earnings per share calculation when doing so would not be anti-dilutive. Performance-based awards are included in the computation of diluted earnings per share only to the extent that the underlying performance conditions (and any applicable market condition) (i) are satisfied as of the end of the reporting period or (ii) would be considered satisfied if the end of the reporting period were the end of the related contingency period and the result would be dilutive under the treasury stock method. When we report a loss for the period presented, the diluted loss per share calculation does not include our potential common stock, as the inclusion of these shares in the calculation would have an anti-dilutive effect. A reconciliation of the number of common shares used in the calculation of basic and diluted EPS is presented in Note 15, “Earnings (Loss) Per Share.”

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Accounting for Stock-Based Compensation—We have two stock-based employee and director compensation plans, which are described more fully in Note 14, "Stock Compensation Plans."

We measure and record compensation expense using the applicable accounting guidance for share-based payments related to stock options, restricted stock, and performance-based awards granted to our directors and employees. The fair value of stock options, including performance awards, without a market condition is estimated, at the date of grant, using the Black-Scholes option-pricing model. The fair value of restricted stock awards and stock options with a market condition is estimated, at the date of grant, using the Monte Carlo Simulation model. The Black-Scholes and Monte Carlo Simulation valuation models incorporate assumptions as to stock price volatility, the expected life of options or awards, a risk-free interest rate and dividend yield. In valuing our stock options, significant judgment is required in determining the expected volatility of our common stock and the expected life that individuals will hold their stock options prior to exercising. Expected volatility for stock options is based on the historical and implied volatility of our own common stock while the volatility for our restricted stock units with a market condition is based on the historical volatility of our own stock and the stock of companies within our defined peer group. The expected life of stock options is derived from the historical actual term of option grants and an estimate of future exercises during the remaining contractual period of the option. While volatility and estimated life are assumptions that do not bear the risk of change subsequent to the grant date of stock options, these assumptions may be difficult to measure as they represent future expectations based on historical experience. Further, our expected volatility and expected life may change in the future, which could substantially change the grant-date fair value of future awards of stock options and, ultimately, the expense we record. The fair value of restricted stock, including performance awards, without a market condition is estimated using the current market price of our common stock on the date of grant.

We expense stock-based compensation for stock options, restricted stock awards, and performance awards over the requisite service period. For awards with only a service condition, we expense stock-based compensation using the straight-line method over the requisite service period for the entire award. For awards with both performance and service conditions, we expense the stock-based compensation on a straight-line basis over the requisite service period for each separately vesting portion of the award, taking into account the probability that we will satisfy the performance conditions. Furthermore, we expense awards with a market condition over the three-year vesting period regardless of the value that the award recipients ultimately receive. All tax-related cash flows resulting from share-based payments are reported as operating activities in the statement of cash flows in the deferred income tax benefit line item. We elect to account for forfeitures related to the service condition-based awards as they occur.

Concentration of Credit Risk—Financial instruments that expose us to concentrations of credit risk consist principally of short-term investments and operating demand deposit accounts. Our policy is to place our operating demand deposit accounts with high credit quality financial institutions, the balances of which at times may exceed federally insured limits. We continually monitor our banking relationships and believe we are not exposed to any significant credit risk on our operating demand deposit accounts.

Estimates—The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates.

Impact of Recently Adopted Accounting Standards—In January 2017, the FASB issued ASU No. 2017-01, *Business Combinations (Topic 805): Clarifying the Definition of a Business* ("ASU 2017-01") in order to clarify the definition of a business and provide additional guidance to assist entities with evaluating whether transactions should be accounted for as acquisitions (or disposals) of assets or businesses. FASB ASC Topic 805 recognized three elements of a business: inputs, processes, and outputs. While an integrated set of assets and activities (collectively referred to as a "set") that is a business usually has outputs, outputs are not required to be present. Additionally, all the inputs and processes that a seller used in operating a set were not required if market participants could acquire the set and continue to produce outputs. ASU 2017-01 provides a screen to determine when a set is not a business. The screen requires that when substantially all of the fair value of the gross assets acquired (or disposed of) is concentrated in a single identifiable asset or a group of similar identifiable assets, the set is not a business. If the screen is not met, the

new guidance (1) requires that to be considered a business, a set must include, at a minimum, an input and a substantive process that together significantly contribute to the ability to create output and (2) removes the evaluation of whether a market participant could replace missing elements. The new guidance provides a framework to assist entities in evaluating whether both an input and a substantive process are present. This framework includes two sets of criteria to consider that depend on whether a set has outputs. Although outputs are not required for a set to be a business, outputs generally are a key element of a business. ASU 2017-01 provides more stringent criteria for sets without outputs and more narrowly defines the term output. ASU 2017-01 became effective for us on January 1, 2018 and was applied prospectively. Our adoption of the new guidance did not have a material impact on our consolidated financial statements.

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In October 2016, the FASB issued ASU No. 2016-16, *Income Taxes (Topic 740): Intra-Entity Transfers of Assets Other than Inventory* ("ASU 2016-16"), which removes the prohibition in FASB ASC Topic 740 against the immediate recognition of the current and deferred income tax effects of intra-entity transfers of assets other than inventory. This ASU requires the tax effects of intercompany transactions, other than sales of inventory, to be recognized when the transfer occurs, instead of deferred until the transferred asset is sold to a third party or otherwise recovered through use of the asset. The new guidance must be applied on a modified retrospective basis through a cumulative-effect adjustment directly to retained earnings as of the beginning of the period of adoption. ASU 2016-16 became effective for us on January 1, 2018 and was applied on a modified retrospective basis. Our adoption of the new guidance did not have a material impact on our consolidated financial statements.

In August 2016, the FASB issued ASU No. 2016-15, *Statement of Cash Flows (Topic 230)*: *Classification of Certain Cash Receipts and Cash Payments* ("ASU 2016-15"), which clarifies how companies present and classify certain cash receipts and cash payments in the statement of cash flows. ASU 2016-15 became effective for us on January 1, 2018 and was applied on a modified retrospective basis. Our adoption of the new guidance did not have a material impact on our consolidated financial statements.

In May 2014, the FASB issued ASU No. 2014-09, *Revenue from Contracts with Customers: (Topic 606)* ("ASU 2014-09"), amending its accounting guidance related to revenue recognition. Under this ASU and subsequently issued amendments, revenue is recognized to depict the transfer of goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. Additional disclosures are required to provide the nature, amount, timing and uncertainty of revenue and cash flows arising from customer contracts, including significant judgments and changes in judgments and assets recognized from costs incurred to obtain or fulfill a contract. We adopted ASU 2014-09 effective January 1, 2018 using the modified retrospective method of adoption. The following is a summary of impacts by significant revenue stream:

• Measurement equipment and related software: Under the prior accounting guidance, FASB ASC Topic 605, which is applicable to reporting periods before January 1, 2018, sales of measurement and imaging equipment and related software sales were generally recognized upon shipment, as we considered the earnings process complete as of the shipping date. The related software sold with our measurement and imaging equipment functions together with such equipment to deliver the tangible product's essential functionality. Further, customers frequently purchase extended warranties with the purchase of measurement equipment and related software. Under the new adopted guidance, FASB ASC Topic 606, which is applicable to reporting periods beginning on or after January 1, 2018, we allocate the contract price to performance obligations based on our best estimate of the standalone selling price. We make this allocation estimate utilizing data from the sale of our applicable products and services to customers separately in similar circumstances, with the exception of software licenses. With respect to software licenses, we use the residual method for allocating the contract price to performance obligations relating to software licenses. Revenue related to our measurement and imaging equipment and related software is generally recognized upon shipment from our facilities or when delivered to the customer location, as determined by the agreed upon shipping terms, at which time we are entitled to payment and title and control has passed to the customer. Our adoption of the new guidance did not result in material changes to our accounting for revenue related to our measurement and imaging equipment and related software.

• Extended warranties: Under the prior accounting guidance, FASB ASC Topic 605, which is applicable to reporting periods before January 1, 2018, extended warranty sales were recognized on a straight-line basis over the term of the warranty. Extended warranty sales include contract periods that extend between one month and three years. The unearned service revenues reported in current and noncurrent liabilities on our consolidated balance sheets appropriately reflect the remaining performance obligations related to these contracts. Our adoption of the new guidance, FASB ASC Topic 606, which is applicable to reporting periods beginning on or after January 1, 2018, did not result in material changes to our accounting for revenue related to extended warranties.

• Software: Under the prior accounting guidance, FASB ASC Topic 605, which is applicable to reporting periods before January 1, 2018, software-only sales were recognized when no further significant production, modification or customization of the software was required and when the following criteria were met: persuasive evidence of a sales

agreement existed, delivery had occurred, and the sales price was fixed or determinable and deemed collectible. These software arrangements generally include short-term maintenance that is considered post-contract support. Maintenance renewals, when sold, were recognized on a straight-line basis over the term of the maintenance agreement. Our adoption of the new guidance, FASB ASC Topic 606, which is applicable to reporting periods beginning on or after January 1, 2018, did not result in material changes to our accounting for revenue related to software-only sales and maintenance renewals.

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The unearned service revenue liabilities reported on our consolidated balance sheets reflect the contract liabilities to satisfy the remaining performance obligations for extended warranties and software maintenance. The current portion of unearned service revenues on our consolidated balance sheets is what we expect to recognize to revenue within twelve months after the applicable balance sheet date relating to extended warranty and software maintenance contract liabilities. The Unearned service revenues - less current portion on our consolidated balance sheets is what we expect to recognize to revenue extending beyond twelve months after the applicable balance sheet date relating to extended warranty and software maintenance contract liabilities. Customer deposits on our consolidated balance sheets represent customer prepayments on contracts for performance obligations that we must satisfy in the future to recognize the related contract revenue. These amounts are generally related to performance obligations which are delivered in less than 12 months. During the year ended December 31, 2018, we recognized $25.0 million of service revenue that was deferred on our consolidated balance sheet as of December 31, 2017.

Under the prior accounting guidance, FASB ASC Topic 605, which is applicable to reporting periods before January 1, 2018, we recognized sales commission expense as incurred. Under the new guidance, FASB ASC Topic 606, which is applicable to reporting periods beginning on or after January 1, 2018, we must capitalize the commission expense and amortize such costs ratably over the term of the contract. In accordance with the practical expedient and modified retrospective method of adoption, we recorded a net increase to opening retained earnings as of January 1, 2018 of $1.8 million and recognized an associated $2.4 million deferred cost asset due to the cumulative impact of adopting the new guidance. As of December 31, 2018, the deferred cost asset related to deferred commissions was approximately $2.7 million. For classification purposes, $1.8 million and $0.9 million are comprised within the Prepaid expenses and other current assets and Other long-term assets, respectively, on our consolidated balance sheet as of December 31, 2018.

We have elected the practical expedient to account for shipping and handling as activities to fulfill the promise to transfer the good. As such, shipping and handling fees billed to customers in a sales transaction are recorded in Product Sales and shipping and handling costs incurred are recorded in Cost of Sales. Additionally, we have elected the practical expedient to exclude from Sales any value added, sales and other taxes that we collect concurrently with revenue-producing activities. These accounting policy elections are consistent with the manner in which we have historically recorded shipping and handling fees and taxes.

The nature of certain of our contracts gives rise to variable consideration, which may be constrained, primarily related to an allowance for sales returns. In accordance with the adoption of the new guidance, we are required to estimate the contract asset related to sales returns and record a corresponding adjustment to Cost of Sales. Historically, our allowance for sales returns has not been material and was approximately $0.1 million as of December 31, 2018. As such, our adoption of the new guidance did not result in material changes to our accounting for variable consideration related to sales returns, and the corresponding contract asset related to such returns. See Note 3 “Revenues” for further information.

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Impact of Recently Issued Accounting Standards—In January 2017, the FASB issued ASU No. 2017-04, *Intangible - Goodwill and Other (Topic 350): Simplifying the Test for Goodwill Impairment* ("ASU 2017-04"), which is intended to simplify the subsequent measurement of goodwill by eliminating Step 2 from the goodwill impairment test. Under the current guidance, performance of Step 2 requires us to calculate the implied fair value of goodwill by following procedures that would be required to determine the fair value of assets acquired and liabilities assumed in a business combination. Under the new guidance, we will perform our goodwill impairment test by comparing the fair value of a reporting unit with its carrying amount. An impairment charge will be recognized for the amount by which the carrying amount exceeds the reporting unit's fair value up to the amount of the goodwill allocated to the reporting unit. The new guidance also eliminates the requirements for any reporting unit with a zero or negative carrying amount to perform Step 2 of the goodwill impairment test if it fails the qualitative assessment. As a result, all reporting units will be subject to the same impairment assessment. We will still have the option to perform the qualitative assessment for a reporting unit to determine if the quantitative impairment test is necessary. ASU 2017-04 becomes effective for annual or any interim goodwill impairment tests in fiscal years beginning after December 15, 2019, with early adoption permitted for annual or any interim goodwill impairment tests after January 1, 2017. The amendments in this ASU will be applied on a prospective basis. Disclosure of the nature and reason for the change in accounting principle is required upon transition. This disclosure is required in the first annual period and in the interim period within the first annual period when we initially adopt the amendments in this ASU. We plan to adopt this guidance for our fiscal year ending December 31, 2020. We do not expect that the adoption of this guidance will have a material impact on our consolidated financial statements.

In February 2016, the FASB issued ASU 2016-02, *Leases (Topic 842)* ("ASU 2016-02"), which is intended to increase transparency and comparability among organizations by recognizing lease assets and lease liabilities on the balance sheet and disclosing key information about leasing arrangements to enable users of financial statements to assess the amount, timing and uncertainty of cash flows arising from leases. ASU 2018-11, *Lease Topic 842: Targeted Improvements*, was issued by the FASB in July 2018 and allows for a cumulative-effect adjustment transition method of adoption. The new guidance is effective for fiscal years beginning after December 15, 2018 and interim periods within those years. We plan to adopt ASU 2016-02 in the first quarter of 2019 with a cumulative-effect adjustment made on January 1, 2019. We are in the process of calculating the impact of adoption of this ASU on our consolidated financial statements, and are currently finalizing the implementation of a lease management software to assist in this task. We believe the most significant changes will be related to the recognition of new right-of-use assets and lease liabilities on our balance sheet for operating leases where we function as a lessee. We estimate the impact of the adoption of ASU 2016-02 will be between a $14 million to $17 million increase in right-of use assets and lease liabilities. We plan to elect certain practical expedients available under the transition provisions to (i) allow aggregation of non-lease components with the related lease components when evaluating accounting treatment, (ii) apply the modified retrospective adoption method, utilizing the simplified transition option, which allows entities to continue to apply the legacy guidance in FASB ASC Topic 840, including its disclosure requirements, in the comparative periods presented in the year of adoption, and (iii) use hindsight in determining the lease term (that is, when considering lessee options to extend or terminate the lease and to purchase the underlying asset) and in assessing impairment of the entity's right-of-use assets. The adoption of ASU 2016-02 will also require any initial direct costs, which are incremental costs that would not have been incurred had the lease not been obtained, to be included in the right-of-use assets. We do not expect the recognition of these costs upon adoption to have a material impact on the right-of-use assets or on our consolidated financial statements.

Reclassifications—Certain prior year amounts have been reclassified in the accompanying consolidated financial statements to conform to the current period presentation:

- Certain reclassifications were made between reporting segments for segment profit during the year ended December 31, 2016 in Note 18, "Segment Reporting" as a result of changes to our methodology for allocating manufacturing variances to our segments. These reclassifications only impacted our segment reporting footnote disclosure.
- In the first quarter of 2018, we combined our historical Factory Metrology and 3D Machine Vision verticals under a single reporting segment, 3D Factory, which replaced our Factory Metrology reporting segment, due to the linkage between the two historical verticals related to the type or class of customers served, the nature of the products and

services provided, and the nature of the production processes. The 3D Machine Vision vertical was previously reported in our Other reporting segment.

- In the first quarter of 2018, we renamed our Construction BIM-CIM vertical and reporting segment "Construction BIM."
- In the first quarter of 2018, we renamed our Other reporting segment "Emerging Verticals."
- In the third quarter of 2018, we merged the historical Factory Metrology and 3D Machine Vision verticals into one vertical named "3D Factory" for greater consistency with our realigned reporting segments.

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- In the third quarter of 2018, we segregated the operations of our acquisitions of Laser Control Systems and Lanmark, along with the operations resulting from our acquisition of substantially all of the assets of Nutfield, into a vertical that we named "Photonics." The creation of this vertical enables us to better focus on our product range directed at laser steering. These operations were historically reported in the 3D Factory reporting segment in the first six months of 2018 and the historical Factory Metrology reporting segment in 2017 and are now included in the Emerging Verticals (formerly known as "Other") reporting segment. Due to this change, we performed a qualitative goodwill impairment analysis in the third quarter of 2018, and management concluded there was no goodwill impairment at the time of this vertical reporting change.
- In the third quarter of 2018, we renamed our Product Design vertical "3D Design."
- In the fourth quarter of 2018, we renamed our 3D Factory vertical and reporting segment "3D Manufacturing."

The amounts related to our reporting segment information for the year ended December 31, 2017 have been restated throughout this Annual Report on Form 10-K to reflect the above changes in our reporting segments. The amounts related to our reporting segment information for the year ended December 31, 2016 were restated but were not impacted by the above changes in our reporting segments. Each of our reporting segments continue to employ consistent accounting policies.

2. SUPPLEMENTAL CASH FLOW INFORMATION

Selected cash payments and non-cash activities were as follows:

	Years ended December 31,		
	2018	2017	2016
Supplemental cash flow information:			
Cash paid for interest	$4	$9	$28
Cash paid for income taxes	$5,813	$2,488	$2,576
Supplemental noncash investing and financing activities:			
Transfer of service and sales demonstration inventory to fixed assets	$964	$2,844	$511

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3. REVENUES

The following tables present our revenues by Sales type as presented in our consolidated statements of operations disaggregated by the timing of transfer of goods or services (in thousands):

	Years ended December 31,		
	2018	2017	2016
Product Sales			
Products transferred to a customer at a point in time	$311,102	$277,922	$256,010
Products transferred to a customer over time	—	—	—
	$311,102	$277,922	$256,010

	Years ended December 31,		
	2018	2017	2016
Service Sales			
Service transferred to a customer at a point in time	$42,932	$36,164	$31,529
Service transferred to a customer over time	49,593	46,831	38,045
	$92,525	$82,995	$69,574

The following table presents our revenues disaggregated by geography, based on the billing addresses of our customers (in thousands):

	Years ended December 31,		
	2018	2017	2016
Total Sales to External Customers			
United States	$156,242	$141,595	$133,924
EMEA [1]	127,261	115,061	101,751
APAC [1]	105,038	90,730	78,094
Other Americas [1]	15,086	13,531	11,815
	$403,627	$360,917	$325,584

[1] Regions represent Europe, the Middle East, and Africa (EMEA); Asia-Pacific (APAC); and Canada, Mexico, and Brazil (Other Americas).

For revenue related to our measurement and imaging equipment and related software, we allocate the contract price to performance obligations based on our best estimate of the standalone selling price. We make this allocation estimate utilizing data from the sale of our applicable products and services to customers separately in similar circumstances, with the exception of software licenses. With respect to software licenses, we use the residual method for allocating the contract price to performance obligations relating to software licenses. Revenue related to our measurement and imaging equipment and related software is generally recognized upon shipment from our facilities or when delivered to the customer location, as determined by the agreed upon shipping terms, at which time we are entitled to payment and title and control has passed to the customer. Software arrangements generally include short-term maintenance that is considered post-contract support (“PCS”), which is considered to be a separate performance obligation. We generally establish standalone sales price for this PCS component based on our maintenance renewal rate. Maintenance renewals, when sold, are recognized on a straight-line basis over the term of the maintenance agreement. Payment for products and services is collected within a short period of time following transfer of control or commencement of delivery of services, as applicable.

Further, customers frequently purchase extended warranties with the purchase of measurement equipment and related software. Warranties are considered a performance obligation when services are transferred to a customer over time and as such, we recognize revenue on a straight-line basis over the warranty term. Extended warranty sales include

contract periods that extend between one month and three years.

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We capitalize commission expenses related to deliverables transferred to a customer over time and amortize such costs ratably over the term of the contract. As of December 31, 2018, the deferred cost asset related to deferred commissions was approximately $2.7 million. For classification purposes, $1.8 million and $0.9 million are comprised within the Prepaid expenses and other current assets and Other long-term assets, respectively, on our consolidated balance sheet as of December 31, 2018.

The unearned service revenue liabilities reported on our consolidated balance sheets reflect the contract liabilities to satisfy the remaining performance obligations for extended warranties and software maintenance. The current portion of unearned service revenues on our consolidated balance sheets is what we expect to recognize to revenue within twelve months after the applicable balance sheet date relating to extended warranty and software maintenance contract liabilities. The Unearned service revenues - less current portion on our consolidated balance sheets is what we expect to recognize to revenue extending beyond twelve months after the applicable balance sheet date relating to extended warranty and software maintenance contract liabilities. Customer deposits on our consolidated balance sheets represent customer prepayments on contracts for performance obligations that we must satisfy in the future to recognize the related contract revenue. These amounts are generally related to performance obligations which are delivered in less than 12 months. During the year ended December 31, 2018, we recognized $25.0 million of service revenue that was deferred on our consolidated balance sheet as of December 31, 2017.

The nature of certain of our contracts gives rise to variable consideration, which may be constrained, primarily related to an allowance for sales returns. We are required to estimate the contract asset related to sales returns and record a corresponding adjustment to Cost of Sales. Our allowance for sales returns was approximately $0.1 million as of December 31, 2018.

Shipping and handling fees billed to customers in a sales transaction are recorded in Product Sales and shipping and handling costs incurred are recorded in Cost of Sales. We exclude from Sales, any value added, sales and other taxes that we collect concurrently with revenue-producing activities.

4. ALLOWANCE FOR DOUBTFUL ACCOUNTS

Activity in the allowance for doubtful accounts was as follows:

	Years ended December 31,		
	2018	2017	2016
Balance, beginning of year	$1,957	$1,829	$1,417
Provision (net of recovery)	907	370	898
Amounts written off, net of recoveries	(1,116)	(242)	(486)
Balance, end of year	$1,748	$1,957	$1,829

5. SHORT-TERM INVESTMENTS

Short-term investments at December 31, 2018 consisted of U.S. Treasury Bills totaling $24.8 million, consisting of $9.0 million maturing on March 14, 2019, $10.9 million maturing on June 6, 2019, and $4.9 million maturing on June 20, 2019. Short-term investments at December 31, 2017 consisted of U.S. Treasury Bills totaling $11.0 million that matured on January 11, 2018. The interest rates on the U.S. Treasury Bills held on December 31, 2018 and maturing on March 14, 2019, June 6, 2019, and June 20, 2019 were 2.2%, 2.4%, and 2.3%, respectively, and were less than one percent for the U.S. Treasury Bills held as of December 31, 2017. The investments are classified as held-to-maturity and recorded at cost plus accrued interest, which approximates fair value.

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6. INVENTORIES

Inventories are stated at the lower of cost or net realizable value using the first-in first-out method. We have three principal categories of inventory: 1) manufactured product to be sold; 2) sales demonstration inventory - completed product used to support our sales force, for demonstrations and held for sale; and 3) service inventory - completed product and parts used to support our service department and held for sale. Shipping and handling costs are classified as a component of cost of sales in our consolidated statements of operations. Sales demonstration inventory is held by our sales representatives for up to three years, at which time it is refurbished and transferred to finished goods as used equipment, stated at the lower of cost or net realizable value. We expect these refurbished units to remain in finished goods inventory and to be sold within 12 months at prices that produce reduced gross margins. Service inventory is used to provide a temporary replacement product to a customer covered by a premium warranty when the customer's unit requires service or repair and as training equipment. Service inventory is available for sale; however, management does not expect service inventory to be sold within 12 months and, as such, classifies this inventory as a long-term asset. Service inventory that we utilize for training or repairs and which we deem as no longer available for sale is transferred to fixed assets at the lower of cost or net realizable value and depreciated over the remaining life, typically three years.

Inventories consist of the following:

	December 31, 2018	December 31, 2017
Raw materials	$ 39,859	$ 36,328
Finished goods	25,585	17,458
Inventories, net	$ 65,444	$ 53,786
Service and sales demonstration inventory, net	$ 39,563	$ 39,614

7. GOODWILL

Our goodwill at December 31, 2018 and 2017 is related to our acquisitions. We evaluate each reporting unit's fair value as compared to its carrying value on October 1st of each year or more frequently if events or changes in circumstances indicate that the carrying value may exceed the fair value. As of December 31, 2017, we evaluated each reporting unit's fair value as compared to its carrying value, and used step 1 of the quantitative goodwill impairment test, where the fair value of the reporting units was measured using a discounted cash flow model and incorporated discount rates commensurate with the risks involved for each reporting unit and a market approach. The key assumptions used in this discounted cash flow model include discount rates, growth rates, cash flow projections and terminal value rates. These rates were susceptible to change and required significant management judgment. The market approach relied on an analysis of publicly-traded companies similar to us and derived a range of revenue and profit multiples. The publicly-traded companies used in the market approach were selected based on our defined peer group. The resulting multiples were then applied to each reporting unit to determine fair value. As of October 1, 2018, we performed a qualitative assessment, on a reporting unit level, to determine whether the existence of events or circumstances lead to a determination that it is more likely than not that the fair value of a reporting unit is less than its carrying amount. We did not identify any such event or circumstance at that time. Impairments to goodwill are charged against earnings in the period the impairment is identified.

We focus on five operating segments: 3D Manufacturing, Construction BIM, Public Safety Forensics, 3D Design, and Photonics. As of December 31, 2018 and 2017, we did not have any goodwill that was identified as impaired. The increase in goodwill during 2018 and 2017 reflected the acquisitions completed in those periods and changes in foreign exchange rates.

December 31, 2018	Additions

	Beginning Balance		Foreign Currency Translation	Ending Balance
3D Manufacturing	$40,802	$—	$(1,316)	$39,486
Construction BIM	6,521	1,010	(226)	7,305
Public Safety Forensics	3,070	—	(107)	2,963
3D Design	—	9,130	(180)	8,950
Photonics	2,357	6,283	(70)	8,570
Total	$52,750	$16,423	$(1,899)	$67,274

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December 31, 2017	Beginning Balance	Additions	Foreign Currency Translation	Ending Balance
3D Manufacturing	$37,861	$—	$ 2,941	$40,802
Construction BIM	6,078	—	443	6,521
Public Safety Forensics	2,805	55	210	3,070
3D Design	—	—	—	—
Photonics	—	2,357	—	2,357
Total	$46,744	$2,412	$ 3,594	$52,750

8. INTANGIBLE ASSETS

Intangible assets consist of the following:

	As of December 31, 2018		
	Carrying Value	Accumulated Amortization	Net Intangible
Amortizable intangible assets:			
Product technology	$26,588	$ 12,332	$ 14,256
Patents and trademarks	14,647	6,601	8,046
Customer relationships	12,027	2,588	9,439
Other	8,693	7,380	1,313
Total	$61,955	$ 28,901	$ 33,054

	As of December 31, 2017		
	Carrying Value	Accumulated Amortization	Net Intangible
Amortizable intangible assets:			
Product technology	$19,459	$ 10,885	$ 8,574
Patents and trademarks	13,948	5,720	8,228
Customer relationships	5,889	1,685	4,204
Other	7,443	5,909	1,534
Total	$46,739	$ 24,199	$ 22,540

Amortization expense was $5.4 million, $4.5 million and $2.9 million in 2018, 2017 and 2016, respectively. The estimated amortization expense for each of the years 2019 through 2023 and thereafter is as follows:

Years ending December 31,	**Amount**
2019	$5,333
2020	4,886
2021	4,717
2022	4,231
2023	3,804
Thereafter	10,083
	$33,054

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9. ACCRUED LIABILITIES

Accrued liabilities consist of the following:

	As of December 31,	
	2018	2017
Accrued compensation and benefits	$17,745	$16,144
Accrued warranties	2,571	2,628
Professional and legal fees	2,154	1,541
Taxes other than income	3,550	3,787
General services administration contract contingent liability (see Note 13)	5,267	—
Other accrued liabilities	5,040	3,262
	$36,327	$27,362

Activity related to accrued warranties was as follows:

	Years ended December 31,		
	2018	2017	2016
Balance, beginning of year	$2,628	$2,594	$2,309
Provision for warranty expense	4,096	4,045	3,544
Fulfillment of warranty obligations	(4,153)	(4,011)	(3,259)
Balance, end of year	$2,571	$2,628	$2,594

10. FAIR VALUE MEASUREMENTS

The guidance on fair value measurements and disclosures defines fair value, establishes a framework for measuring fair value, and requires enhanced disclosures about assets and liabilities measured at fair value. Fair value is defined as the price at which an asset could be exchanged in a current transaction between knowledgeable, willing parties. A liability's fair value is defined as the amount that would be paid to transfer the liability to a new obligor, not the amount that would be paid to settle the liability with the creditor. Where available, fair value is based on observable market prices or parameters or derived from such prices or parameters. Where observable prices or inputs are not available, valuation models are used to determine fair value. These models employ valuation techniques that involve some level of management estimation and judgment, the degree of which is dependent on the price transparency for the instruments or market and the instruments' complexity.

Assets and liabilities recorded at fair value on a recurring basis in our consolidated balance sheets are categorized based upon the level of judgment associated with the inputs used to measure their fair value. Hierarchical levels, defined by the guidance on fair value measurements, are directly related to the amount of subjectivity associated with the inputs to fair valuation of these assets and liabilities and are as follows:

Level 1 - Valuation is based upon quoted market price for identical instruments traded in active markets.

Level 2 - Valuation is based on quoted market prices for similar instruments in active markets, quoted prices for identical or similar instruments in markets that are not active, and model-based valuation techniques for which all significant assumptions are observable in the market.

Level 3 - Valuation is generated from model-based techniques that use significant assumptions not observable in the market. Valuation techniques include use of discounted cash flow models and similar techniques.

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Fair Value on a Recurring Basis

Assets and liabilities measured at fair value on a recurring basis are categorized in the tables below based upon the lowest level of significant input to the valuations. Historically, we have presented short-term investments in the fair value table presented below. As our short-term investments in the accompanying consolidated balance sheets are comprised of U.S. Treasury Bills, these investments are classified as held-to-maturity investments and are not recorded at fair value on a recurring basis in our consolidated balance sheets. As such, we have removed short-term investments from the table below.

	December 31, 2018		
	Level 1	Level 2	Level 3
Liabilities:			
Contingent consideration [1]	$—	$—	$5,531
Total	$—	$—	$5,531

	December 31, 2017		
	Level 1	Level 2	Level 3
Liabilities:			
Contingent consideration [1]	$—	$—	$412
Total	$—	$—	$412

(1) Contingent consideration liability represents arrangements to pay the former owners of certain companies we acquired based on the former owners attaining future product release milestones. We use a probability-weighted discounted cash flow model to estimate the fair value of contingent consideration liabilities. These probability weightings are developed internally and assessed on a quarterly basis. For the year ended December 31, 2018, we paid $0.9 million as part of these arrangements. For the year ended December 31, 2017, we paid $0.5 million as part of these arrangements. The remaining change in the fair value of the contingent consideration from December 31, 2017 to December 31, 2018 was related to various business acquisitions we made during the year ended December 31, 2018, which included Laser Controls System, Lanmark and Opto-Tech SRL and its subsidiary Open Technologies SRL (collectively, “Open Technologies”), as well as changes in foreign currency exchange rates. The undiscounted maximum payment as of December 31, 2018 under the arrangements was $6.0 million, based on certain milestones.

11. OTHER EXPENSE (INCOME), NET

Other expense (income), net consists of the following:

	Years ended December 31,		
	2018	2017	2016
Foreign exchange transaction losses (gains)	$1,386	$(162)	$1,356
Other	(247)	(28)	(534)
Total other expense (income), net	$1,139	$(190)	$822

12. INCOME TAXES

Income (loss) before income tax (benefit) expense consists of the following:

	Years ended December 31,		
	2018	2017	2016
Domestic	$(1,723)	$2,468	$(1,527)
Foreign	6,281	3,359	14,153

Income before income taxes	$4,558	$5,827	$12,626

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The components of the income tax (benefit) expense for income taxes are as follows:

	Years ended December 31,		
	2018	2017	2016
Current:			
Federal	$(1,694)	$18,951	$409
State	120	507	40
Foreign	1,394	2,072	3,482
Current income tax (benefit) expense	(180)	21,530	3,931
Deferred:			
Federal	(486)	1,038	(2,357)
State	(153)	(580)	(229)
Foreign	447	(1,645)	174
Deferred income tax benefit	(192)	(1,187)	(2,412)
Income tax (benefit) expense	$(372)	$20,343	$1,519

Reconciliations of the income tax expense at the U.S. federal statutory income tax rate compared to our actual income tax (benefit) expense are summarized below:

	Years ended December 31,		
	2018	2017	2016
Tax expense at statutory rate	$956	$1,981	$4,427
State income taxes, net of federal benefit	(195)	81	(50)
Foreign tax rate difference	(1,003)	(2,057)	(1,939)
Research and development credit	(919)	(1,037)	(917)
Change in valuation allowance	464	678	162
Equity based compensation	(198)	33	(255)
Manufacturing credit	—	(191)	(61)
Permanent impact of non-deductible cost	1,120	766	412
Provision to return adjustments	345	777	(61)
Impact of Tax Cuts and Jobs Act of 2017	(1,000)	19,355	—
Other	58	(43)	(199)
Income tax (benefit) expense	$(372)	$20,343	$1,519

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The components of our net deferred income tax asset and liabilities are as follows:

	As of December 31,	
	2018	2017
Net deferred income tax asset - Non-current		
Warranty cost	$533	$695
Inventory reserve	1,559	419
Unearned service revenue	6,684	5,364
Employee stock options	4,222	4,366
Tax Credits	485	1,785
Loss carryforwards	7,038	8,782
Other, net	759	1,479
Total deferred tax assets	21,280	22,890
Valuation Allowance	(1,924)	(1,631)
Total deferred tax assets net of valuation allowance	19,356	21,259
Net deferred income tax liability - Non-current		
Bad debt reserve	(116)	(2)
Depreciation	(2,996)	(3,675)
Goodwill	(1,612)	(1,574)
Intangible assets	(649)	(1,097)
Total deferred tax liabilities	(5,373)	(6,348)
Net deferred tax assets	$13,983	$14,911

On December 22, 2017, the United States enacted the U.S. Tax Cuts and Jobs Act of 2017 (the “U.S. Tax Reform”), resulting in significant modifications to existing law. Under the U.S. Tax Reform, changes include lowering the statutory corporate tax rate from 35% to 21%, eliminating certain deductions, imposing a mandatory tax on accumulated earnings in foreign subsidiaries, introducing new tax regimes, and changing how foreign earnings are subject to United States taxation. The statutory corporate tax rate reduction is effective for tax years beginning on or after January 1, 2018. In accordance with the U.S. Tax Reform, we recorded a provisional amount of $19.4 million of additional income tax expense in the fourth quarter of 2017, the period in which the legislation was enacted. The portion of this $19.4 million provisional amount that related to the transition tax on the mandatory deemed repatriation of foreign earnings was $17.4 million based on our best estimate and guidance available at that time. The portion of the $19.4 million that related to the remeasurement of certain deferred tax assets and liabilities based on the rates at which they are expected to reverse in the future was $2.0 million at that time. Securities and Exchange Commission Staff Accounting Bulletin 118 (“SAB 118”) was issued and provided additional clarification regarding the application of FASB ASC Topic 740 if a company did not have the necessary information available, prepared or analyzed in reasonable detail to complete the accounting for certain income tax effects of the U.S. Tax Reform. December 22, 2018 marked the end of the measurement period for SAB 118. As additional guidance was released during the SAB 118 remeasurement period, we completed our transition tax analysis, which resulted in an income tax benefit of $1.0 million and a $1.8 million decrease of our deferred tax assets recorded in the fourth quarter of 2018 related to adjustments to the transition tax on mandatory deemed repatriation of foreign earnings.

Our domestic entities had deferred income tax assets in the amount of $7.2 million and $7.7 million as of December 31, 2018 and December 31, 2017, respectively. At December 31, 2018 and 2017, our foreign subsidiaries had deferred tax assets primarily relating to net operating losses of $6.5 million and $7.9 million, respectively, some of which expire in the next 1 to 9 years and others which can be carried forward indefinitely. The valuation allowance for deferred tax assets as of December 31, 2018 and 2017 was $1.9 million and $1.6 million, respectively. The net change in the total valuation allowance for each of the years ended December 31, 2018, 2017 and 2016 was a $0.3 million, a $0.7 million and a $0.1 million increase, respectively.

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The valuation allowance as of December 31, 2018 and 2017 was primarily related to foreign net operating loss carryforwards that, in the judgment of management, were not more likely than not to be realized. In assessing the realizability of deferred tax assets, management considers whether it is more likely than not that some or all of the deferred tax assets will not be realized. The ultimate realization of deferred tax assets depends on the generation of future taxable income during the periods in which those temporary differences are deductible. Management considers the scheduled reversal of deferred tax liabilities (including the impact of available carryback and carryforward periods), projected taxable income, and tax-planning strategies in making this assessment.

Significant judgment is required in determining our worldwide provision for income taxes. In the ordinary course of a global business, there are many transactions for which the ultimate tax outcome is uncertain. We review our tax contingencies on a regular basis and make appropriate accruals as necessary.

We file income tax returns in the U.S. federal jurisdiction and various state and foreign jurisdictions. The table below summarizes the open tax years and ongoing tax examinations in major jurisdictions as of December 31, 2018:

Jurisdiction	Open Years	Examination in Process
United States - Federal Income Tax	2015-2018	N/A
United States - various states	2014-2018	N/A
Germany	2014-2018	N/A
Switzerland	2018	N/A
Singapore	2014-2018	N/A

We recognize accrued interest and penalties related to unrecognized tax benefits in income tax expense. The total amount of unrecognized tax benefits that, if recognized, would affect the effective tax rate is not material. We do not currently anticipate that the total amount of unrecognized tax benefits will result in material changes to our financial position. We are subject to income taxes at the federal, state and foreign country level. Our tax returns are subject to examination at the U.S. federal level from 2015 forward and at the state level are subject to a three to four year statute of limitations depending on the state.

13. COMMITMENTS AND CONTINGENCIES

Leases — We lease buildings and equipment under non-cancellable operating leases through 2026. Some of these leases include cost-escalation clauses. Such cost-escalation clauses are recognized on a straight-line basis over the lease term. The following is a schedule of future minimum lease payments required under non-cancellable operating leases with initial terms in excess of one year, in effect at December 31, 2018:

Years ending December 31,	Amount
2019	$7,474
2020	4,679
2021	1,724
2022	1,313
2023	1,270
Thereafter	3,168
Total future minimum lease payments	$19,628

Rent expense for 2018, 2017, and 2016 was $8.6 million, $7.5 million and $7.7 million, respectively.

Purchase Commitments — We enter into purchase commitments for products and services in the ordinary course of business. These purchases generally cover production requirements for 60 to 120 days as well as materials necessary to service customer units through the product lifecycle and for warranty commitments. As of December 31, 2018, we had approximately $56.9 million in purchase commitments that are expected to be delivered within the next 12 months. To ensure adequate component availability in preparation for new product introductions, as of December 31,

2018, we also had $2.3 million in long-term commitments for purchases to be delivered after 12 months.

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Legal Proceedings — We are not involved in any legal proceedings other than routine litigation arising in the normal course of business, none of which we believe will have a material adverse effect on our business, financial condition or results of operations.

U.S. Government Contracting Matter — We have sold our products and related services to the U.S. Government (the "Government") under General Services Administration ("GSA") Federal Supply Schedule contracts (the "GSA Contracts") since 2002 and are currently selling our products and related services to the Government under two such GSA Contracts. Each GSA Contract is subject to extensive legal and regulatory requirements and includes, among other provisions, a price reduction clause (the "Price Reduction Clause"), which generally requires us to reduce the prices billed to the Government under the GSA Contracts to correspond to the lowest prices billed to certain benchmark customers.

Late in the fourth quarter of 2018, during an internal review we preliminarily determined that certain of our pricing practices may have resulted in the Government being overcharged under the Price Reduction Clauses of the GSA Contracts (the "GSA Matter"). As a result, we have begun remediation efforts, including but not limited to, the identification of additional controls and procedures to ensure future compliance with the pricing and other requirements of the GSA Contracts. We have also retained outside legal counsel to assist with these efforts and to conduct a review of our pricing and other practices under the GSA Contracts (the "Review"). On February 14, 2019, we reported the GSA Matter to the GSA and its Office of Inspector General.

Over the six-year period ended December 31, 2018, our sales to the Government under the GSA Contracts were approximately $53.5 million in the aggregate. Our sales to the Government under the GSA Contracts represented approximately 3.5% of our total sales for the year ended December 31, 2018. As a result of the GSA Matter, for fourth quarter 2018, we reduced our total sales by a $4.8 million estimated cumulative sales adjustment, representative of the last six years of estimated overcharges to the Government under the GSA Contracts. In addition, for the fourth quarter of 2018, we recorded $0.5 million of imputed interest related to the estimated cumulative sales adjustment, which increased other expense and resulted in an estimated total liability of $5.3 million for the GSA Matter. This estimate is based on our preliminary review as of the date of this Annual Report on Form 10-K and is subject to change based on the results of the Review being conducted by our outside legal counsel and discussions with the Government.

While we have reported this matter to the GSA, the Government may conduct its own investigation or review (including an audit). We intend to cooperate fully with any Government inquiry. The Government's review of, or investigation into, this matter could result in civil and criminal penalties, administrative sanctions, and contract remedies being imposed on us, including but not limited to, termination of the GSA Contracts, repayments of amounts already received under the GSA Contracts, forfeiture of profits, damages, suspension of payments, fines, and suspension or debarment from doing business with the Government and possibly U.S. state and local governments. We may also be subject to litigation and recovery under the federal False Claims Act and possibly similar state laws, which could include claims for treble damages, penalties, fees and costs. As a result, we cannot reasonably predict the outcome of the Government's review of, or investigation into, this matter at this time or the resulting future financial impact on us. Any of these outcomes could have a material adverse effect on our reputation, our sales, results of operations, cash flows and financial condition, and the trading price of our common stock. In addition, we have incurred, and will continue to incur, legal and related costs in connection with the Review and the Government's response to this matter.

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14. STOCK COMPENSATION PLANS

We have two compensation plans that provide for the granting of stock options and other share-based awards to key employees and non-employee members of the Board of Directors. The 2009 Equity Incentive Plan ("2009 Plan"), and the 2014 Equity Incentive Plan ("2014 Plan") provide for granting options, restricted stock, restricted stock units or stock appreciation rights to employees and non-employee directors.

We were authorized to grant awards for up to 1,781,546 shares of common stock under the 2009 Plan, as well as any shares underlying awards outstanding under our 2004 Equity Incentive Plan (the "2004 Plan") as of the effective date of the 2009 Plan that thereafter terminated or expired unexercised or were canceled, forfeited or lapsed for any reason. There were 122,943 options outstanding at December 31, 2018 under the 2009 Plan at exercise prices between $43.33 and $57.54. The options outstanding under the 2009 Plan have a 10-year term (7 years on grants beginning in 2010) and vest over a 3-year period.

In May 2014, our shareholders approved the 2014 Plan authorizing us to grant awards for up to 1,974,543 shares of common stock, as well as any shares underlying awards outstanding under the 2004 Plan and 2009 Plan as of the effective date of the 2014 Plan that thereafter terminate or expire unexercised or are canceled, forfeited or lapse for any reason. In May 2018, our shareholders approved an amendment to the 2014 Plan, which increased the number of shares available for issuance under the 2014 Plan by 1,000,000 shares. A maximum of 2,974,543 shares are available for issuance under the 2014 Plan, as amended, plus the number of shares (not to exceed 891,960) underlying awards outstanding under the 2004 Plan and the 2009 Plan as of May 29, 2014 that thereafter terminate or expire unexercised or are canceled, forfeited or lapse for any reason. There were 670,047 options outstanding at December 31, 2018 under the 2014 Plan at exercise prices between $29.98 and $61.30. The options outstanding under the 2014 Plan have a 7-year term and generally vest over a 3-year period. No awards were outstanding under the 2004 Plan as of December 31, 2018, and we will not make any further grants under the 2004 Plan or the 2009 Plan.

Upon election to the Board, each non-employee director receives an initial equity grant of shares of restricted common stock with a value equal to $100,000, calculated using the closing share price on the date of the non-employee director's election to the Board. The initial restricted stock grant vests on the third anniversary of the grant date, subject to the non-employee director's continued membership on the Board. Annually, the non-employee directors are granted restricted shares equal to 50% of their compensation on the first business day following the annual meeting of shareholders, calculated using the closing price of our common stock on that day. In addition, the Lead Director is annually granted restricted shares with a value equal to $40,000 on the first business day following the annual meeting of shareholders, calculated using the closing price of our common stock on that day. The shares of restricted stock granted annually to our non-employee directors and our Lead Director vest on the day prior to the following year's annual meeting date, subject to a non-employee director's continued membership on the Board. We record compensation cost associated with our restricted stock grants on a straight-line basis over the vesting term. Also, beginning in October 2018, our non-employee directors may elect to have their annual cash retainers and annual equity retainers paid in the form of deferred stock units pursuant to the 2014 Plan and the 2018 Non-Employee Director Deferred Compensation Plan. Each deferred stock unit represents the right to receive one share of our common stock upon the non-employee director's separation of service from the Company. We record compensation cost associated with our deferred stock units over the period of service.

Annually, upon approval by our Compensation Committee, we grant stock options and restricted stock units to certain employees. We also grant stock options and restricted stock units to certain new employees throughout the year. Prior to 2016, these awards vested in three equal annual installments beginning one year after the grant date. The fair value of these stock-based awards is determined by using (a) the current market price of our common stock on the grant date in the case of restricted stock units or (b) the Black-Scholes option valuation model in the case of stock options.

In 2015, we granted performance-based stock options and restricted stock units to certain executives. These awards vested in three annual installments beginning one year after the grant date if the applicable performance measures or strategic objectives were achieved. The related stock-based compensation expense was recognized over the requisite service period, taking into account the probability that we would satisfy the performance measures or strategic objectives. In addition to certain strategic objectives, the performance-based stock options and restricted stock units

granted in 2015 were earned and vested based on (1) our achievement of specified revenue and EPS targets, and (2) our total shareholder return ("TSR") relative to the TSR attained by companies within our defined peer group.

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Due to the TSR presence in certain performance-based grants, the fair value of these awards was determined using the Monte Carlo Simulation valuation model. We expensed these market condition awards over the three-year vesting period regardless of the value that the award recipients ultimately receive. In March 2018, our Compensation Committee determined that 7,743 performance-based stock options and 266 restricted stock units were earned and vested for the 2017 performance period and 17,160 stock options and 640 restricted stock units were determined to be unearned, as the required metrics were not achieved. As of December 31, 2018, all performance-based stock options and restricted stock units granted in 2015 were either vested or were forfeited because they were not earned.

We did not grant performance-based stock options and restricted stock units to our employees during 2018. Instead, our annual grant in March 2018 consisted of stock options and restricted stock units that are subject to only time-based vesting. The number of stock options and restricted stock units granted was based on the employee's individual objectives, performance against operational metrics assigned to the employee, and overall contribution to the Company over the last year. The restricted stock unit awards vest in full on the three-year anniversary of the grant date. The stock options vest in three equal annual installments beginning one year after the grant date. The fair value of these stock-based awards is determined by using (a) the current market price of our common stock on the grant date in the case of restricted stock units or (b) the Black-Scholes option valuation model in the case of stock options.

The Black-Scholes option valuation model incorporates assumptions as to stock price volatility, the expected life of options or awards, a risk-free interest rate and dividend yield. The weighted-average grant-date fair value of the stock options that were granted during the years ended December 31, 2018, 2017, and 2016 and valued using the Black-Scholes option valuation model was $23.43, $14.51 and $12.90 per option, respectively. For stock options granted during the years ended December 31, 2018, 2017, and 2016 valued using the Black-Scholes option valuation model, we used the following assumptions:

	Years ended December 31,		
	2018	2017	2016
Risk-free interest rate	2.65%	1.88% - 2.02%	1.06% - 1.57%
Expected dividend yield	—%	—%	—%
Expected option life	4 years	5 years	4 years
Expected volatility	45%	45.2%	45.0% - 47.0%
Weighted-average expected volatility	45.0%	45.2%	46.1%

Historical information was the primary basis for the selection of the expected dividend yield, expected volatility and the expected lives of the options. The risk-free interest rate was based on the yields of U.S. zero coupon issues and U.S. Treasury issues, with a term equal to the expected life of the option being valued.

There were no market condition awards granted during the years ended December 31, 2018, 2017 and 2016 and, as such, the Monte Carlo Simulation valuation model was not used to determine the fair value of the stock options and restricted stock units granted during 2018.

A summary of stock option activity and weighted average exercise prices follows:

	Options	Weighted-Average Exercise Price	Weighted-Average Remaining Contractual Term (Years)	Aggregate Intrinsic Value as of December 31, 2018
Outstanding at January 1, 2018	1,156,763	$ 45.93		
Granted	174,439	61.30		
Forfeited	(81,222)	51.66		
Exercised	(439,877)	47.21		
Unearned performance-based options	(17,160)	59.97		
Outstanding at December 31, 2018	792,943	$ 47.59	4.4	$ 2,160
Options exercisable at December 31, 2018	427,006	$ 48.84	2.1	$ 862

The aggregate intrinsic value of stock options exercised during the years ended December 31, 2018, 2017, and 2016 was $7.5 million, $1.2 million and $1.7 million, respectively. The total fair value of stock options vested during the years ended December 31, 2018, 2017, and 2016 was $3.7 million, $4.1 million and $3.8 million, respectively.

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The following table summarizes the restricted stock and restricted stock unit activity and weighted average grant-date fair values for the year ended December 31, 2018:

	Shares	Weighted-Average Grant Date Fair Value
Non-vested at January 1, 2018	257,492	$ 34.75
Granted	102,458	60.26
Forfeited	(29,692)	39.36
Vested	(18,618)	35.03
Unearned performance-based awards	(640)	51.15
Non-vested at December 31, 2018	311,000	$ 42.66

We recorded total stock-based compensation expense associated with our stock incentive plans of $7.6 million, $6.5 million and $5.4 million in 2018, 2017 and 2016, respectively.
As of December 31, 2018, there was $10.3 million in total unrecognized stock-based compensation expense related to non-vested stock-based compensation arrangements. The expense is expected to be recognized over a weighted average period of 1.8 years.

15. EARNINGS (LOSS) PER SHARE

Basic earnings (loss) per share is computed by dividing net income (loss) by the weighted average number of shares outstanding. Diluted earnings per share is computed by also considering the impact of potential common stock on both net income and the weighted average number of shares outstanding. Our potential common stock consists of employee stock options, restricted stock, restricted stock units and performance-based awards. Our potential common stock is excluded from the basic earnings per share calculation and is included in the diluted earnings per share calculation when doing so would not be anti-dilutive. Performance-based awards are included in the computation of diluted earnings per share only to the extent that the underlying performance conditions (and any applicable market condition) (i) are satisfied as of the end of the reporting period or (ii) would be considered satisfied if the end of the reporting period were the end of the related contingency period and the result would be dilutive under the treasury stock method. When we report a net loss for the period presented, the diluted loss per share calculation does not include our potential common stock, as the inclusion of these shares in the calculation would have an anti-dilutive effect. A reconciliation of the number of common shares used in the calculation of basic and diluted earnings (loss) per share is presented below:

	Years Ended December 31,					
	2018		2017		2016	
	Shares	Per-Share Amount	Shares	Per-Share Amount	Shares	Per-Share Amount
Basic earnings (loss) per share	17,043,167	$ 0.29	16,711,534	$(0.87)	16,654,786	$ 0.67
Effect of dilutive securities	305,289	—	—	—	26,924	—
Diluted earnings (loss) per share	17,348,456	$ 0.29	16,711,534	$(0.87)	16,681,710	$ 0.67
Securities excluded from the determination of weighted average shares for the calculation of diluted earnings (loss) per share, as they were potentially antidilutive	393,970		1,049,563		1,046,947	

16. EMPLOYEE RETIREMENT BENEFIT PLAN

We maintain a 401(k) defined contribution retirement plan for our eligible U.S. employees. Costs charged to operations in connection with the 401(k) plan during 2018, 2017 and 2016 aggregated $2.1 million, $1.7 million, and $1.4 million, respectively.

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17. VARIABLE INTEREST ENTITY

A variable interest entity ("VIE") is an entity that has one of three characteristics: (1) it is controlled by someone other than its shareowners or partners, (2) its shareowners or partners are not economically exposed to the entity's earnings (for example, they are protected against losses), or (3) it lacks sufficient equity to permit the entity to finance its activities without additional subordinated financial support from other parties.

On April 27, 2018, we invested $1.8 million in Present4D GmbH ("Present4D"), a software solutions provider for professional virtual reality presentations and training environments, in the form of an equity capital contribution. This contribution represents a minority investment in Present4D. This investment's business purpose is to coordinate the design and development of modules supporting compatibility with virtual reality for our existing software offerings.

As of our investment date, Present4D was thinly capitalized and lacked the sufficient equity to finance its activities without additional subordinated financial support and is classified as a VIE. We do not have power over decisions that significantly affect Present4D's economic performance and do not represent its primary beneficiary. After April 27, 2020, Present4D may request additional equity financing of up to $1.8 million from us in exchange for additional share capital, which additional equity financing would be at our discretion. We have not provided support to Present4D during the periods presented outside of our initial investment of $1.8 million. We do not intend to provide future support to Present4D, and we will continue to evaluate whether we intend to obtain the aforementioned additional share capital in the future. Our 16.5% portion of Present4D's net loss for the year ended December 31, 2018 was approximately $0.1 million. Present4D is currently accounted for using the equity method of accounting. Our equity in the net loss from this equity method investment is recorded as loss with a corresponding decrease in the investment. Our investment in this unconsolidated VIE at December 31, 2018 was $1.7 million and is included in Other long-term assets in our consolidated balance sheet as of December 31, 2018. $1.8 million represents our maximum exposure to loss for our involvement with Present4D. We had no VIE investments as of December 31, 2017.

18. SEGMENT REPORTING

We have three reporting segments: 3D Manufacturing, Construction BIM, and Emerging Verticals. These segments are based upon the vertical markets that we currently serve. Business activities that do not meet the criteria to be reporting segments are aggregated in the Emerging Verticals category.

We develop, manufacture, market, support and sell CAD-based quality assurance products integrated with CAD-based inspection and statistical process control software and 3D documentation systems in each of these reporting segments. These activities represent more than 99% of consolidated sales.

Our Chief Operating Decision Maker (CODM), our Chief Executive Officer, evaluates segment performance and allocates resources based upon profitable growth. We use segment profit to evaluate the performance of our reporting segments. Segment profit is calculated as gross profit, net of selling and marketing expenses, for the reporting segment. Our definition of segment profit may not be comparable to similarly-titled measures reported by other companies.

Our segment structure presented below represents a change from the prior year as further described in Note 1 "Summary of Significant Accounting Policies". The amounts related to our reporting segment information for the year ended December 31, 2017 have been restated throughout this Annual Report on Form 10-K to reflect such changes in our reporting segments. The amounts related to our reporting segment information for the year ended December 31, 2016 were restated but were not impacted by such changes in our reporting segments. Each of our reporting segments continue to employ consistent accounting policies.

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The following tables present information about our reporting segments, including a reconciliation of total segment profit to income (loss) from continuing operations included in the consolidated statements of operations for the years ended 2018, 2017, and 2016:

	3D Manufacturing	Construction BIM	Emerging Verticals	Total
2018				
Total sales to external customers	$ 264,430	$ 96,185	$43,012	$403,627
Segment profit	$ 80,775	$ 27,513	$3,137	$111,425
General and administrative				47,652
Depreciation and amortization				18,313
Research and development				39,706
Income from operations				**$5,754**

	3D Manufacturing	Construction BIM	Emerging Verticals	Total
2017				
Total sales to external customers	$ 243,464	$ 86,349	$31,104	$360,917
Segment profit	$ 77,537	$ 21,077	$2,479	$101,093
General and administrative				43,807
Depreciation and amortization				16,588
Research and development				35,376
Income from operations				**$5,322**

	3D Manufacturing	Construction BIM	Emerging Verticals	Total
2016				
Total sales to external customers	$ 236,313	$ 65,056	$24,215	$325,584
Segment profit	$ 73,656	$ 14,799	$9,635	$98,090
General and administrative				40,813
Depreciation and amortization				13,868
Research and development				30,125
Income from operations				**$13,284**

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Total sales to external customers is based upon the geographic location of the customer.

	For the Years Ended December 31,		
	2018	2017	2016
Total sales to external customers			
United States	$156,242	$141,595	$133,924
Americas-Other	15,086	13,531	11,815
Germany	53,251	49,860	44,041
Europe-Other	74,010	65,201	57,710
Japan	37,607	35,270	32,530
Asia-Other	67,431	55,460	45,564
	$403,627	$360,917	$325,584

Long-lived assets consist primarily of property, plant, and equipment, goodwill, and intangible assets, and are attributed to the geographic area in which they are located or originated, as applicable.

	As of December 31,		
	2018	2017	2016
Long-Lived Assets			
United States	$61,557	$54,703	$54,157
Americas-Other	10,702	13,834	13,486
Germany	30,154	26,611	23,734
Europe-Other	24,935	9,124	6,949
Japan	1,039	558	460
Asia-Other	2,358	2,246	1,915
	$130,745	$107,076	$100,701

19. BUSINESS COMBINATIONS

In April 2017, we completed the acquisition of substantially all of the assets of Nutfield, a component technology business located in Hudson, New Hampshire, which specializes in the design and manufacture of advanced galvanometer-based optical scanners, scan heads and laser kits, for a total purchase price of approximately $5.5 million. This acquisition supports our long-term strategy to expand our presence in key markets and improve our existing product lines with innovative technology. The results of the acquired business' operations as of and after the date of acquisition have been included in our consolidated financial statements as of and for the years ended December 31, 2018 and December 31, 2017.

On March 9, 2018, we acquired all of the outstanding shares of Laser Control Systems, a laser component technology business located in Bedfordshire, United Kingdom, which specializes in the design and manufacture of advanced digital scan heads and laser software, for a purchase price of $1.7 million. An additional $0.7 million in contingent consideration may be earned by the former owners if certain milestones are met. This acquisition supports our Photonics vertical and our long-term strategy to expand our presence and product portfolio in Photonics applications. The results of Laser Control Systems' operations as of and after the date of acquisition have been included in our consolidated financial statements as of and for the year ended December 31, 2018.

On March 16, 2018, we acquired all of the outstanding shares of Photocore AG, a vision-based 3D measurement application and software developer in Zurich, Switzerland, for a total purchase price of $2.4 million. This acquisition supports our Construction BIM vertical and our long-term strategy to improve our existing software offerings with

innovative technology in photogrammetry. The results of PhotoCore AG's operations as of and after the date of acquisition have been included in our consolidated financial statements as of and for the year ended December 31, 2018.

On July 6, 2018, we acquired all of the outstanding shares of Lanmark, a high-speed laser marking control boards and laser marking software provider located in Acton, Massachusetts, for a purchase price of $6.3 million. An additional $1.0 million in contingent consideration may be earned by the former owners if certain milestones are met. This acquisition supports the development of components used in new 3D laser inspection product development in order to further expand the product portfolio of our Photonics vertical. The results of Lanmark's operations as of and after the date of acquisition have been included in our consolidated financial statements as of and for the year ended, December 31, 2018.

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On July 13, 2018, we acquired all of the issued and outstanding corporate capital of Open Technologies, a 3D structured light scanning solution company located in Brescia, Italy, for an aggregate purchase price of up to €18.5 million ($21.6 million), subject to post-closing adjustments based on actual net working capital, net financial position and transaction expenses. The aggregate purchase price includes up to €4.0 million ($4.7 million) in contingent consideration that may be earned by the former owners if certain product development milestones are met. The U.S. Dollar amounts have been converted from Euros based on the foreign exchange rate in effect on the closing date of the acquisition. This acquisition supports our 3D Design vertical and our long-term strategy to establish a presence in 3D measurement technology used in other industries and applications, especially dental and medical. The results of Open Technologies' operations as of and after the date of acquisition have been included in our consolidated financial statements as of and for the year ended, December 31, 2018.

The acquisitions of Nutfield, Laser Control Systems, Photocore AG, Lanmark and Open Technologies constitute business combinations as defined by FASB ASC Topic 805, *Business Combinations*. Accordingly, the assets acquired and liabilities assumed were recorded at their fair values on the date of acquisition. The purchase price allocation marked as "Preliminary" below is based on the information that was available to make estimates of the fair value and may change as further information becomes available and additional analyses are completed. While we believe such information provides a reasonable basis for estimating the fair values, we may obtain more information and evidence during the measurement period that result in changes to the estimated fair value amounts. The measurement period ends on the earlier of one year after the acquisition date or the date we receive the information about the facts and circumstances that existed at the acquisition date. Subsequent adjustments, if necessary, will be recognized during the period in which the amounts are determined. These refinements include: (1) changes in the estimated fair value of certain intangible assets acquired; and (2) changes in deferred tax assets and liabilities related to the fair value estimates. The purchase price allocations marked as "Final" below represent our final determination of the fair value of the assets acquired and liabilities assumed for such acquisitions.

Following is a summary of our allocations of the purchase price to the fair values of the assets acquired and liabilities assumed as of the date of each acquisition:

	Nutfield (Final)	Laser Controls Systems (Final)	Photocore AG (Final)	Lanmark (Final)	Open Technologies [3] (Preliminary)
Accounts receivable	$160	$—	$ —	$610	$ 2,735
Inventory	539	—	—	299	1,852
Other assets	96	—	—	76	634
Deferred income tax assets	131	—	—	—	—
Intangible assets	2,329	1,400	1,435	1,366	10,388
Goodwill [1]	2,357	928	1,010	5,355	9,130
Accounts payable and accrued liabilities	(12)	—	—	(159)	(2,926)
Other liabilities [2]	(104)	(579)	—	(971)	(5,201)
Deferred income tax liabilities	—	—	—	(325)	—
Total purchase price, net of cash acquired	$5,496	$1,749	$ 2,445	$6,251	$ 16,612

(1) The goodwill arising from the acquisitions consists largely of the expected synergies from combining operations as well as the value of the workforce. A portion of the goodwill is expected to be tax deductible for Nutfield.

(2) For Laser Control Systems, Lanmark and Open Technologies, this total consists primarily of the fair value of the projected contingent consideration.

(3)

Amounts converted from Euros to U.S. Dollars based on the foreign exchange rate on the closing date of the acquisition.

Following are the details of the purchase price allocated to the intangible assets acquired for the acquisitions noted above:

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	Nutfield (Final)		Laser Control Systems (Final)		Photocore AG (Final)		Lanmark (Final)		Open Technologies (Preliminary)	
	Amount	Weighted Average Life (Years)	Amount	Weighted Average Life (Years)	Amount	Weighted Average Life (Years)	Amount	Weighted Average Life (Years)	Amount	Weighted Average Life (Years)
Trade name	$29	1	$—	0	$—	0	$—	0	$—	0
Brand	—	0	26	1	22	1	26	1	103	1
Non-competition agreement	144	5	29	3	9	3	—	0	—	0
Technology	1,970	10	1,319	7	1,343	7	760	7	4,441	7
Customer relationships	95	10	26	10	61	10	580	10	5,844	10
Favorable in-place lease	91	12	—	0	—	0	—	0	—	0
Fair value of intangible assets acquired	$2,329	10	$1,400	7	$1,435	7	$1,366	8	$10,388	8

The goodwill for the Nutfield, Laser Control Systems, Lanmark and Open Technologies acquisitions has been allocated to the Emerging Verticals reporting segment. The goodwill for the Photocore AG acquisition has been allocated to the Construction BIM reporting segment.

Acquisition and integration costs are not included as components of consideration transferred, but are recorded as expense in the period in which such costs are incurred. To date, we have incurred approximately $0.9 million in acquisition and integration costs for the Nutfield, Laser Control Systems, Photocore AG, Lanmark and Open Technologies acquisitions. Pro forma financial results for Nutfield, Laser Control Systems, Photocore AG, Lanmark, and Open Technologies have not been presented because the effects of these transactions, individually and in the aggregate, were not material to our consolidated results of operations.

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20. SUBSEQUENT EVENTS

On January 9, 2019, we entered into a letter agreement (the "Letter Agreement") with Dr. Simon Raab, setting forth the terms of Dr. Raab's retirement as our President and Chief Executive Officer and as a member of our Board of Directors. Dr. Raab will continue as our President and Chief Executive Officer and will remain on the Board of Directors until his successor is appointed. The Letter Agreement provides for the following compensation arrangements with Dr. Raab as an incentive to retain his services through the transition period:

- *Base salary* - Dr. Raab's base salary of $775,000 will continue until his retirement date.
- *Short-term incentive plan* - Dr. Raab will be eligible to participate in our short-term incentive plan for 2019 with a target payout of 100% of his base salary conditioned upon our achievement of the 2019 financial targets approved by our Compensation Committee. In the event Dr. Raab's retirement occurs prior to the end of 2019, he will be eligible to receive this incentive without pro ration. The payout to Dr. Raab under our short-term incentive plan could range from 0% to 200% of his base salary depending upon our achievement of our 2019 financial targets.
- *Long-term incentives* - In lieu of an annual grant of stock options and in consideration for Dr. Raab's commitment to provide transition assistance to his successor for a period of six months following his retirement date, on January 9, 2019, Dr. Raab received a grant of 24,606 restricted stock units, which will vest six months following his retirement date. In addition, all of Dr. Raab's outstanding unvested stock options will fully vest as of his retirement date, and he will be permitted to exercise such options over the full term of each option grant.

On January 29, 2019, we entered into a Second Amendment to Amended and Restated Lease Agreement (the "Second Amendment") with Emma Investments, LLC ("Landlord") with respect to our facility located at 125 Technology Park, Lake Mary, Florida (the "Building"). Pursuant to the Second Amendment, we have agreed to, among other items, extend the initial term of the lease for the approximately 35,000 square feet of production, research and development, service operations and manufacturing space in the Building leased under the original Amended and Restated Lease Agreement effective October 12, 2009, from June 30, 2019 to March 31, 2025.

The Second Amendment also provides us with a tenant improvement allowance of up to $0.1 million toward the design and construction of certain tenant improvements made to the Building on a reimbursement basis subject to the satisfaction of certain conditions. If the tenant improvements are not completed by March 31, 2021, the reimbursement allowance will be deemed waived by us.

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21. QUARTERLY RESULT OF OPERATIONS (UNAUDITED)

Quarter ended	March 31, 2018	June 30, 2018	September 30, 2018	December 31, 2018
Sales[1]	$ 92,834	$ 98,244	$ 99,705	$ 112,844
Gross profit[2]	53,786	57,691	52,317	64,551
Net income (loss)[3]	455	1,205	(2,488)	5,758
Net income (loss) per share:				
Basic	$ 0.03	$ 0.07	$ (0.15)	$ 0.33
Diluted	$ 0.03	$ 0.07	$ (0.15)	$ 0.33

(1) For the fourth quarter of 2018, sales were reduced by a $4.8 million estimated cumulative sales adjustment, representative of the last six years of estimated overcharges to the Government under the GSA Contracts.

(2) For the third quarter of 2018, gross profit was reduced by a $4.7 million inventory reserve charge resulting from an analysis of our inventory reserves in connection with our new product introductions and acquisitions, which increased our reserve for excess and obsolete inventory.

(3) For the fourth quarter of 2018, as additional guidance was released during the SAB 118 remeasurement period related to the U.S. Tax Reform, we completed our transition tax analysis, which resulted in an income tax benefit of $1.0 million.

Quarter ended	March 31, 2017	June 30, 2017	September 30, 2017	December 31, 2017
Sales	$ 81,562	$ 82,682	$ 90,250	$ 106,423
Gross profit	43,749	46,760	52,034	62,094
Net (loss) income[1]	(1,461)	(3,625)	1,628	(11,058)
Net (loss) income per share:				
Basic	$ (0.09)	$ (0.22)	$ 0.10	$ (0.66)
Diluted	$ (0.09)	$ (0.22)	$ 0.10	$ (0.66)

(1) For the fourth quarter of 2017, $19.4 million of additional income tax expense was recorded pursuant to the U.S. Tax Reform. $17.4 million of this expense related to a provisional amount of transition tax on the mandatory deemed repatriation of foreign earnings. $2.0 million of this expense related to the remeasurement of our deferred tax assets and liabilities.

ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE

None.

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ITEM 9A. CONTROLS AND PROCEDURES

Evaluation of Disclosure Controls and Procedures

We conducted an evaluation, under the supervision and with the participation of our management, including our Chief Executive Officer and Chief Financial Officer, of the effectiveness of the design and operation of our disclosure controls and procedures as of December 31, 2018. Disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, as amended (the "Exchange Act")) are designed to provide reasonable assurance that information required to be disclosed in our reports filed under the Exchange Act, such as this Annual Report on Form 10-K, is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms. Disclosure controls and procedures also include, without limitation, controls and procedures that are designed to provide reasonable assurance that such information is accumulated and communicated to our management, including our Chief Executive Officer and Chief Financial Officer, as appropriate, to allow timely decisions regarding required disclosure.

The evaluation of our disclosure controls and procedures included a review of the control objectives and design, our implementation of the controls and the effect of the controls on the information generated for use in this Annual Report on Form 10-K. In conducting this evaluation, our Chief Executive Officer and Chief Financial Officer concluded that our disclosure controls and procedures, as defined by Rule 13a-15(e) under the Exchange Act, were effective as of December 31, 2018 to provide reasonable assurance that information required to be disclosed in this Annual Report on Form 10-K was recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms and was accumulated and communicated to our management, including our Chief Executive Officer and Chief Financial Officer, as appropriate, to allow timely decisions regarding required disclosure.

Changes in Internal Control over Financial Reporting

There was no change in our internal control over financial reporting that occurred during the quarter ended December 31, 2018 that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

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Management's Report on Internal Control over Financial Reporting

Management is responsible for establishing and maintaining adequate internal control over financial reporting (as defined in Rule 13a-15(f) of the Exchange Act). Internal control over financial reporting is the process designed under the Chief Executive Officer's and the Chief Financial Officer's supervision, and effected by our Board of Directors, management and other personnel, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles in the United States.

There are inherent limitations in the effectiveness of internal control over financial reporting, including the possibility that misstatements may not be prevented or detected. Accordingly, an effective control system, no matter how well designed and operated, can provide only reasonable assurance of achieving the designed control objectives, and management is required to apply its judgment in evaluating the cost-benefit relationship of possible controls and procedures. Because of the inherent limitations in all control systems, no evaluation of controls can provide absolute assurance that all control issues and instances of fraud, if any, within the Company have been detected. The design of any system of controls is also based in part upon certain assumptions about the likelihood of future events, and there can be no assurance that any design will succeed in achieving its stated goals under all potential future conditions.

Under the supervision and with the participation of our management, including our Chief Executive Officer and Chief Financial Officer, we conducted an evaluation of the effectiveness of our internal control over financial reporting as of December 31, 2018, as required by Exchange Act Rule 13a-15(c). In making this assessment, we used the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission ("COSO") in the 2013 *Internal Control - Integrated Framework*. We have excluded from the scope of our assessment of internal control over financial reporting the operations and related assets of Opto-Tech SRL and its subsidiary, Open Technologies SRL (collectively, "Open Technologies"), which we acquired in 2018. At December 31, 2018 and for the period from acquisition through December 31, 2018, total assets and sales subject to Open Technologies' internal control over financial reporting represented less than one percent of our consolidated total assets and total sales, respectively, as of and for the year ended December 31, 2018. Based on our assessment under the framework in the 2013 *Internal Control - Integrated Framework*, management concluded that our internal control over financial reporting was effective as of December 31, 2018.

Grant Thornton LLP, the independent registered public accounting firm that audited our consolidated financial statements and internal control over financial reporting, has issued an attestation report on our internal control over financial reporting as of December 31, 2018, which appears below.

FARO Technologies, Inc.
Lake Mary, Florida
February 20, 2019

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REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM
Board of Directors and Shareholders
FARO Technologies, Inc.

Opinion on internal control over financial reporting
We have audited the internal control over financial reporting of FARO Technologies, Inc. (a Florida corporation) and subsidiaries (the "Company") as of December 31, 2018, based on criteria established in the 2013 *Internal Control-Integrated Framework* issued by the Committee of Sponsoring Organizations of the Treadway Commission ("COSO"). In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2018, based on criteria established in the 2013 *Internal Control-Integrated Framework* issued by COSO.
We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) ("PCAOB"), the consolidated financial statements of the Company as of and for the year ended December 31, 2018, and our report dated February 20, 2019 expressed an unqualified opinion on those financial statements.

Basis for opinion
The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management's Report on Internal Control over Financial Reporting ("Management's Report"). Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.
We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.
Our audit of, and opinion on, the Company's internal control over financial reporting does not include the internal control over financial reporting of Opto-Tech SRL and its subsidiary Open Technologies SRL (collectively, "Open Technologies"), a wholly-owned subsidiary of the Company, whose financial statements reflect total assets and total sales each constituting less than one percent, respectively, of the related consolidated financial statement amounts as of and for the year ended December 31, 2018. As indicated in Management's Report, Open Technologies was acquired during 2018. Management's assertion on the effectiveness of the Company's internal control over financial reporting excluded internal control over financial reporting of Open Technologies.

Definition and limitations of internal control over financial reporting
A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ GRANT THORNTON LLP
Orlando, Florida
February 20, 2019

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ITEM 9B. OTHER INFORMATION

On February 14, 2019, our Board of Directors adopted the FARO Technologies, Inc. Executive Severance Plan (the "Executive Severance Plan"). The Executive Severance Plan provides eligible employees at the senior vice president level or above who are not otherwise covered by an individual employment agreement that provides severance benefits (each, a "participant"),with benefits in the event they are involuntarily terminated by the Company other than for cause or as a result of the participant's death or disability. The Executive Severance Plan does not apply in the event there is a change in control of the Company and the participant collects severance benefits pursuant to a change in control agreement or any other agreement in place between the Company and the participant.

Severance benefits generally include (1) 12 months of the participant's annual salary, payable in a single lump sum, (2) up to 12 months of the employer portion of any COBRA premiums incurred for any medical, dental and/or vision insurance a participant elects to continue and (3) up to 12 months' use of our employee assistance plan. Payment of severance benefits is conditioned upon a participant's execution of a compete release of claims against the Company that has not been revoked during the applicable rescission period.

The Executive Severance Plan is a severance welfare plan and is subject to the requirements of the Employee Retirement Income Security Act of 1974, as amended. We may amend, modify or terminate the Executive Severance Plan at any time for any reason.

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PART III

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

The information required by this Item with respect to directors and executive officers is incorporated herein by reference to the information under the headings “Election of Directors” and “Executive Officers” contained in our definitive proxy statement for our 2019 Annual Meeting of Shareholders, which we refer to as the Proxy Statement.
The information required by this Item regarding compliance with Section 16(a) of the Exchange Act appears under the heading “Section 16(a) Beneficial Ownership Reporting Compliance” in the Proxy Statement and is incorporated herein by reference.
The information required by this Item with respect to corporate governance and our Code of Ethics is incorporated herein by reference to the information contained in the Proxy Statement under the heading “Corporate Governance and Board Matters.”

ITEM 11. EXECUTIVE COMPENSATION

The information required by this Item regarding executive compensation is incorporated herein by reference to the information contained in the Proxy Statement under the headings “Executive Compensation” and “2018 Director Compensation.”
The information required by this Item regarding Compensation Committee interlocks and insider participation is incorporated herein by reference to the information contained in the Proxy Statement under the heading “Corporate Governance and Board Matters.”

ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS

The information required by this Item regarding security ownership of certain beneficial owners and management and related stockholder matters is incorporated herein by reference to the information contained in the Proxy Statement under the headings “Security Ownership of Certain Beneficial Owners and Management” and “Equity Compensation Plan Information.”

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE

The information required by this Item about certain relationships and related transactions appears under the heading “Certain Relationships and Related Transactions” in the Proxy Statement and is incorporated herein by reference.
The information required by this Item regarding director independence is incorporated herein by reference to the information contained in the Proxy Statement under the heading “Corporate Governance and Board Matters.”

ITEM 14. PRINCIPAL ACCOUNTANT FEES AND SERVICES

The information required by this Item about principal accountant fees and services as well as related pre-approval policies appears under the heading “Independent Public Accountants” in the Proxy Statement and is incorporated herein by reference.

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PART IV

ITEM 15. EXHIBITS AND FINANCIAL STATEMENT SCHEDULES

(a) (1) Financial Statements.

The following consolidated financial statements required by this item are included in Part II, Item 8 of this Annual Report on Form 10-K under the caption “Financial Statements and Supplementary Data”:

Report of Independent Registered Public Accounting Firm
Consolidated Balance Sheets
Consolidated Statements of Operations
Consolidated Statements of Comprehensive (Loss) Income
Consolidated Statements of Shareholders’ Equity
Consolidated Statements of Cash Flows
Notes to Consolidated Financial Statements

(2) Financial Statement Schedules.

All financial statement schedules have been omitted as they are either not required or not applicable, or the required information is otherwise included in our consolidated financial statements or the notes thereto.

(b) Exhibits. The exhibits listed in the accompanying Exhibit Index are filed or incorporated by reference as part of this Annual Report on Form 10-K.

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EXHIBIT INDEX

Exhibit No.	Description
2.1	Stock Purchase Agreement, dated as of August 26, 2016, by and among FARO Technologies, Inc., Laser Projection Technologies, Inc., each of the shareholders of Laser Projection Technologies, Inc. and Steven P. Kaufman in the capacity of the Seller Representative (Filed as Exhibit 2.1 to Registrant's Current Report on Form 8-K filed August 30, 2016, and incorporated herein by reference)**
2.2	Quota Purchase Agreement, dated as of July 13, 2018, by and among FARO Technologies, Inc., Opto-Tech SRL, each of the shareholders of Opto-Tech SRL, and Mr. Gianfranco Chiapparini, in the capacity as the Seller Representative (Filed as Exhibit 2.1 to Registrant's Current Report on Form 8-K, filed July 19, 2018, and incorporated herein by reference)**
3.1	Amended and Restated Articles of Incorporation, as amended (Filed as Exhibit 3.1 to Registrant's Registration Statement on Form S-1/A filed September 10, 1997, No. 333-32983, and incorporated herein by reference)
3.2	Amended and Restated Bylaws (Filed as Exhibit 3.1 to Registrant's Current Report on Form 8-K, filed February 3, 2010, and incorporated herein by reference, SEC File No. 000-23081)
4.1	Specimen Stock Certificate (Filed as Exhibit 4.1 to Registrant's Registration Statement on Form S-1/A , filed September 10, 1997, No. 333-32983, and incorporated herein by reference)
10.1	Amended and Restated 2004 Equity Incentive Plan (Filed as Exhibit 10.1 to Registrant's Form 8-K filed November 24, 2008, and incorporated herein by reference, SEC File No. 000-23081)*
10.2	Amendment to Amended and Restated 2004 Equity Incentive Plan (Filed as Exhibit 10.3 to Registrant's Form 8-K, filed April 8, 2009, and incorporated herein by reference, SEC File No. 000-23081)*
10.3	2009 Equity Incentive Plan (Filed as Appendix A to Registrant's Definitive Proxy Statement on Schedule 14A filed April 15, 2009, and incorporated herein by reference, SEC File No. 000-23081)*
10.4	First Amendment to the 2009 Equity Incentive Plan (Filed as Exhibit 10.1 to Registrant's Current Report on Form 8-K, filed April 15, 2011, and incorporated herein by reference, SEC File No. 000-23081)*
10.5	2014 Incentive Plan (Filed as Exhibit 10.1 to Registrant's Current Report on Form 8-K, filed June 3, 2014, and incorporated herein by reference)*
10.6	2014 Incentive Plan, as amended May 11, 2018 (Filed as Exhibit 10.1 to Registrant's Current Report on Form 8-K filed May 15, 2018, and incorporated herein by reference)*
10.7	Summary of Director Compensation Program (Filed as Exhibit 10.7 to Registrant's Annual Report on Form 10-K for the year ended December 31, 2015, and incorporated herein by reference)*
10.8	Form of Intellectual Property and Confidentiality Agreement between FARO Technologies, Inc. and new employees (Filed as Exhibit 10.8 to Registrant's Annual Report on Form 10-K for the year ended December 31, 2015, and incorporated herein by reference)
10.9	

	Form of Stock Option Award Agreement under the 2004 Equity Incentive Plan (Filed as Exhibit 10.1 to Registrant's Quarterly Report on Form 10-Q for the quarter ended March 29, 2008, and incorporated herein by reference, SEC file No. 000-23081)*
10.10	Form of Stock Option Award Agreement under the 2009 Equity Incentive Plan (Filed as Exhibit 10.10 to Registrant's Annual Report on Form 10-K for the year ended December 31, 2015, and incorporated herein by reference)*
10.11	Form of performance-based Stock Option Award Agreement under the 2014 Incentive Plan (Filed as Exhibit 10.12 to Registrant's Annual Report on Form 10-K for the year ended December 31, 2015, and incorporated herein by reference)*

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10.12	Form of performance-based Restricted Stock Unit Award Agreement under the 2014 Incentive Plan (Filed as Exhibit 10.13 to Registrant's Annual Report on Form 10-K for the year ended December 31, 2015, and incorporated herein by reference)*
10.13	Form of Restricted Stock Unit Award Agreement under the 2014 Incentive Plan (Filed as Exhibit 10.4 to Registrant's Quarterly Report on Form 10-Q for the quarter ended June 30, 2016, and incorporated herein by reference)*
10.14	Form of time-based Stock Option Award Agreement under the 2014 Incentive Plan (Filed as Exhibit 10.15 to Registrant's Annual Report on Form 10-K for the year ended December 31, 2016, and incorporated herein by reference)*
10.15	Form of Restricted Stock Award Agreement under the 2014 Incentive Plan (Filed as Exhibit 10.14 to Registrant's Annual Report on Form 10-K for the year ended December 31, 2017, and incorporated herein by reference)*
10.16	Employment Agreement between FARO Technologies, Inc. and Joseph Arezone, dated as of April 27, 2016 (Filed as Exhibit 10.2 to Registrant's Current Report on Form 8-K, filed April 29, 2016, and incorporated herein by reference)*
10.17	Letter Agreement between FARO Technologies, Inc. and Joseph Arezone dated March 5, 2018 (Filed as Exhibit 10.1 to Registrant's Current Report on Form 8-K filed March 5, 2018, and incorporated herein by reference)*
10.18	Transition and Separation Agreement between FARO Technologies, Inc. and Joseph Arezone effective June 5, 2018 (Filed as Exhibit 10.1 to Registrant's Current Report on Form 8-K filed June 8, 2018, and incorporated herein by reference)*
10.19	Amended and Restated Employment Agreement between FARO Technologies, Inc. and Kathleen J. Hall, dated as of April 27, 2016 (Filed as Exhibit 10.1 to Registrant's Current Report on Form 8-K filed April 29, 2016, and incorporated herein by reference)*
10.20	Amended and Restated Employment Agreement between FARO Technologies, Inc. and Jody S. Gale, dated as of April 27, 2016 (Filed as Exhibit 10.3 to Registrant's Current Report on Form 8-K filed April 29, 2016, and incorporated herein by reference)*
10.21	Employment Agreement between FARO Technologies, Inc. and Robert E. Seidel, dated December 21, 2016 (Filed as Exhibit 10.1 to Registrant's Current Report on Form 8-K filed December 21, 2016, and incorporated herein by reference)*
10.22	Letter Agreement between FARO Technologies, Inc. and Simon Raab dated January 9, 2019 (Filed as Exhibit 10.1 to Registrant's Current Report on Form 8-K filed January 11, 2019, and incorporated herein by reference)*
10.23	FARO Technologies, Inc. Amended and Restated Change in Control Severance Policy, dated as of April 9, 2015 (Filed as Exhibit 10.1 to Registrant's Current Report on Form 8-K, filed April 10, 2015, and incorporated herein by reference)*
10.24	2018 Non-Employee Director Deferred Compensation Plan*
10.25	Form of Deferred Stock Unit Award Agreement under the 2014 Incentive Plan and the 2018 Non-Employee Director Deferred Compensation Plan*

10.26	Form of Restricted Stock Unit Award Agreement under the 2014 Incentive Plan and the 2018 Non-Employee Director Deferred Compensation Plan*
10.27	FARO Technologies, Inc. Executive Severance Plan and Summary Plan Description, dated as of February 14, 2019*
10.28	Office Flex Lease, dated September 26, 2007, by and between FARO Technologies, Inc. and Sun Life Assurance Company of Canada (Filed as Exhibit 10.15 to Registrant's Annual Report on Form 10-K for the year ended December 31, 2007, and incorporated herein by reference, SEC File No. 000-23081)
10.29	First Amendment to Lease Agreement, dated October 1, 2009, by and between FARO Technologies, Inc. and Sun Life Assurance Company of Canada (Filed as Exhibit 10.27 to Registrant's Annual Report on Form 10-K for the year ended December 31, 2009, and incorporated herein by reference, SEC File No. 000-23081)

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10.30	Amended and Restated Lease Agreement, dated October 1, 2009, by and between FARO Technologies, Inc. and Emma Investments, LLC (Filed as Exhibit 10.26 to Registrant's Annual Report on Form 10-K for the year ended December 31, 2009, and incorporated herein by reference, SEC File No. 000-23081)
10.31	First Amendment to Amended and Restated Lease Agreement between Emma Investments, LLC and FARO Technologies, Inc., dated as of May 14, 2014 (Filed as Exhibit 10.1 to Registrant's Current Report on Form 8-K filed May 16, 2014, and incorporated herein by reference)
10.32	Second Amendment to Amended and Restated Lease Agreement, dated as of January 29, 2019, by and between FARO Technologies, Inc. and Emma Investments, LLC (Filed as Exhibit 10.1 to Registrant's Current Report on Form 8-K filed January 31, 2019, and incorporated herein by reference)
10.33	Agreement of Lease (Amendment and Restatement) between 290 National Road Limited Partnership and FARO Technologies, Inc., dated as of September 9, 2014 (Filed as Exhibit 10.1 to Registrant's Current Report on Form 8-K filed September 12, 2014, and incorporated herein by reference)
10.34	Assignment and Assumption of Lease, dated April 21, 2017, by and between FARO Technologies, Inc., Instrument Associates, LLC and Century Park, L.L.C. (Filed as Exhibit 10.27 to Registrant's Annual Report on Form 10-K for the year ended December 31, 2017, and incorporated herein by reference)
10.35	Non-residential Tenancy Agreement, dated July 1, 2017, by and between Eredi Martinelli Marmi E Graniti S.p.A. and Opto-tech S.R.L.
21.1	List of Subsidiaries
23.1	Consent of Grant Thornton LLP
24.1	Power of Attorney relating to subsequent amendments (included on the signature page(s) of this report).
31-A	Certification of the Chief Executive Officer Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002
31-B	Certification of the Chief Financial Officer Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002
32-A	Certification of the Chief Executive Officer Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002
32-B	Certification of the Chief Financial Officer Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002
99.1	Properties
101.INS	XBRL Instance Document
101.SCH	XBRL Taxonomy Extension Schema Document
101.CAL	XBRL Taxonomy Calculation Linkbase
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document
101.LAB	XBRL Taxonomy Labels Linkbase Document

101.PRE XBRL Taxonomy Presentation Linkbase Document

* Indicates management contracts or compensatory plans or arrangements

** Schedules and exhibits are omitted pursuant to Item 601(b)(2) of Regulation S-K. Registrant agrees to furnish supplementally a copy of any omitted schedules or exhibits to the Securities and Exchange Commission upon request.

ITEM 16. FORM 10-K SUMMARY

None.

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SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

FARO TECHNOLOGIES, INC.

Date: February 20, 2019 By: /s/ Robert Seidel
Robert Seidel, Chief Financial Officer
(Duly Authorized Officer)

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the registrant and in the capacities and on the dates indicated. Each person whose signature appears below constitutes and appoints each of SIMON RAAB, ROBERT SEIDEL AND JODY GALE his or her true and lawful attorney-in-fact and agent, with full power of substitution and revocation, for him or her and in his or her name, place and stead, in any and all capacities, to sign any and all amendments to this report and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as he or she might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or any of them, may lawfully do or cause to be done by virtue hereof.

Signature	Title	Date
/s/ Simon Raab Simon Raab	Chairman of the Board, Director, President and Chief Executive Officer (Principal Executive Officer)	February 20, 2019
/s/ Robert Seidel Robert Seidel	Chief Financial Officer (Principal Financial Officer and Principal Accounting Officer)	February 20, 2019
/s/ John Caldwell John Caldwell	Director	February 20, 2019
/s/ Lynn Brubaker Lynn Brubaker	Director	February 20, 2019
/s/ Stephen R. Cole Stephen R. Cole	Director	February 20, 2019
/s/ John Donofrio John Donofrio	Director	February 20, 2019
/s/ Jeffrey A. Graves	Director	February 20, 2019

Jeffrey A. Graves		
/s/ Yuval Wasserman Yuval Wasserman	Director	February 20, 2019

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