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COGNEX CORPORATION
 ANNUAL REPORT ON FORM 10-K
 FOR THE YEAR ENDED DECEMBER 31, 2018
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PART I

This Annual Report on Form 10-K contains forward-looking statements within the meaning of the Federal Securities Laws. Readers can identify these forward-looking statements by our use of the words “expects,” “anticipates,” “estimates,” “believes,” “projects,” “intends,” “plans,” “will,” “may,” “shall,” “could,” “should,” and similar words and other statements of sense. Our future results may differ materially from current results and from those projected in the forward-looking statements as a result of known and unknown risks and uncertainties. Readers should pay particular attention to considerations described in the section captioned “Risk Factors,” appearing in Part I - Item 1A of this Annual Report on Form 10-K. We caution readers not to place undue reliance upon any such forward-looking statements, which speak only as of the date made. We disclaim any obligation to subsequently revise forward-looking statements to reflect the occurrence of anticipated or unanticipated events or circumstances after the date such statements are made.

Unless the context otherwise requires, the words “Cognex®,” the “Company,” “we,” “our,” “us,” and “our company” refer to Cognex Corporation and its consolidated subsidiaries.

ITEM 1: BUSINESS

Corporate Profile

Cognex Corporation was incorporated in Massachusetts in 1981. Our corporate headquarters are located at One Vision Drive, Natick, Massachusetts 01760 and our telephone number is (508) 650-3000.

Cognex is a leading worldwide provider of machine vision products that capture and analyze visual information in order to automate tasks, primarily in manufacturing processes, where vision is required. Machine vision products are used to automate the manufacture and tracking of discrete items, such as mobile phones, aspirin bottles, and automobile tires, by locating, identifying, inspecting, and measuring them during the manufacturing or distribution process. Machine vision is important for applications in which human vision is inadequate to meet requirements for size, accuracy, or speed, or in instances where substantial cost savings are obtained through the reduction of labor or improved product quality. Today, many types of manufacturing equipment require machine vision because of the increasing demands for speed and accuracy in manufacturing processes, as well as the decreasing size of items being manufactured.

What is Machine Vision?

Since the beginning of the Industrial Revolution, human vision has played an indispensable role in the process of manufacturing products. Human eyes did what no machines could do themselves: locating and positioning work, tracking the flow of parts, and inspecting output for quality and consistency. Today, however, the requirements of many manufacturing processes have surpassed the limits of human eyesight. Manufactured items often are produced too quickly or with tolerances too small to be analyzed by the human eye. In response to manufacturers’ needs, “machine vision” technology emerged, providing manufacturing equipment with the gift of sight. Machine vision systems were first widely embraced by manufacturers of electronic components who needed this technology to produce computer chips with decreasing geometries. However, advances in technology and ease-of-use, combined with the decreasing cost of implementing vision applications, have made machine vision available to a broader range of users.

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Machine vision products combine cameras with innovative software to collect images and then answer questions about these images, such as:

Question	Description	Example
GUIDANCE		
Where is it?	Determining the exact physical location and orientation of an object.	Determining the position of a printed circuit board so that a robot can automatically be guided to place electronic components.
IDENTIFICATION		
What is it?	Identifying an object by analyzing its physical appearance or by reading a serial number or symbol.	Reading a two-dimensional barcode directly marked on an automotive airbag so that it can be tracked and processed correctly through manufacturing.
INSPECTION		
How good is it?	Inspecting an object for flaws or defects.	Checking for debris to ensure that foreign objects are not present in a product before shipping to consumers.
GAUGING		
What size is it?	Determining the dimensions of an object.	Determining the diameter of a bearing prior to final assembly.

Machine Vision Market

Cognex machine vision is primarily used to automate manufacturing and distribution processes in a variety of industries, where the technology is widely recognized as an important component of automated production and quality assurance. Virtually every manufacturer can achieve better quality and manufacturing efficiency by using machine vision, and therefore, Cognex products are used by a broad base of customers across a variety of industries, including consumer electronics, automotive, consumer products, food and beverage, pharmaceuticals, and medical devices. Cognex products are also used outside of the manufacturing sector to automate distribution processes in the logistics industry for applications in retail distribution and ecommerce to scan, track, and sort goods through distribution centers.

The Company operates in one segment, machine vision technology. We offer a variety of machine vision products that have similar economic characteristics, have the same production processes, and are distributed by the same sales channels to the same types of customers. Information about segments may be found in Note 19 to the Consolidated Financial Statements, appearing in Part II - Item 8 of this Annual Report on Form 10-K.

In 2018, 2017, and 2016, direct and indirect revenue from Apple Inc. accounted for 15%, 20%, and 17% of total revenue, respectively.

Business Strategy

Our goal is to expand our position as a leading worldwide provider of machine vision products. We are selective in choosing growth opportunities that we believe will maintain our historically high gross margin percentages, which have ranged in the mid 70s for the past several years and reflect the value our customers place on our innovative products. Our strong and unique corporate culture reinforces our values of customer first and innovation, and enables us to attract and retain smart, highly-educated, experienced talent who are motivated to solve the most challenging vision tasks.

We invest heavily in research and development in order to maintain our position as a technology leader in machine vision. We invest in technology that makes vision easier to use and more affordable, and therefore, available to a broader base of customers, such as our vision sensor products that enable customers with a lower budget to use machine vision without the help of sophisticated engineers. We also invest in technology that addresses the most challenging vision applications, such as our 3D vision products that solve applications where a height or volume measurement is required. We identify large customers with high-volume applications and offer them collaborative development to deliver solutions to solve their complex vision problems.

We continue to invest in our core markets, such as consumer electronics and automotive, where we are a leading provider of vision and ID products for factory automation, while we seek opportunities to expand into adjacent markets for vision, such as logistics, airport baggage handling, mobile terminals, life sciences, and collaborative

robotics. We invest through internal development, as well as the acquisition of businesses and technologies. We reach a broad base of customers through our worldwide direct sales force that sells to large, strategic customers, as well as through our network of distributors and integrators that sell primarily to smaller customers who may be more geographically remote. We invest in emerging, high-growth regions where many manufacturers can benefit from

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incorporating machine vision into their production processes. This includes investment in China, where rising wages for assembly workers and a greater focus on product quality are driving assembly automation, particularly in the consumer electronics industry.

Acquisitions

Our business strategy includes selective expansion into new machine vision applications and markets through the acquisition of businesses and technologies. In 2017 and 2016, we completed six small business acquisitions, which were not significant individually or in the aggregate. The purchase price for each business ranged from \$2.5 million to \$23 million. In addition to completed technology and customer relationships, these acquisitions included engineering talent expected to help accelerate the development of future products. Management considers business acquisitions to be an important part of our growth strategy, and although we continue to actively seek out acquisition opportunities, we are selective in choosing businesses that we believe will enhance our long-term growth rate and profitability. We plan to continue to seek opportunities to expand our product lines, customer base, distribution network, and technical talent through acquisitions in the machine vision industry.

Products

Cognex offers a full range of vision and ID products designed to meet customer needs at different performance and price points. Our products range from low-cost vision sensors that are easily integrated, to PC-based systems for users with more experience or more complex requirements. Our products also have a variety of physical forms, depending upon the user's needs. For example, customers can purchase vision software to use with their own camera and processor, or they can purchase a standalone unit that combines camera, processor, and software into a single package.

Vision Software

Vision software provides users with the most flexibility by combining the full general-purpose library of Cognex vision tools with the cameras, frame grabbers, and peripheral equipment of their choice. Applications based upon Cognex vision software perform a wide range of vision tasks, including part location, identification, measurement, assembly verification, and robotic guidance. Cognex's VisionPro® software offers an extensive suite of patented vision tools for advanced programming, while Cognex Designer allows customers to build complete vision applications with the simplicity of a graphical, flowchart-based programming environment. Cognex ViDi deep learning-based image analysis software solves complex applications that are too complicated and time-consuming to program and maintain with traditional machine vision rules-based algorithms.

Vision Systems and Sensors

Vision systems combine camera, processor, and vision software into a single, rugged package with a simple and flexible user interface for configuring applications. General-purpose vision systems are designed to be easily programmed to perform a wide range of vision tasks including part location, identification, measurement, assembly verification, and robotic guidance. Unlike general-purpose vision systems, vision sensors are designed to deliver very simple, low-cost, reliable solutions for a limited number of common vision applications such as checking the presence and size of parts. Cognex offers the In-Sight® product line of vision systems in a wide range of models to meet various price and performance requirements. Cognex also offers a series of 3D vision systems for use in highly demanding applications that require surface feature measurements that go beyond the capabilities of 2D vision technology.

ID Products

ID products quickly and reliably read codes (e.g., one-dimensional barcodes or two-dimensional data matrix codes) that have been applied to, or directly marked on, discrete items during the manufacturing process. Manufacturers of goods ranging from automotive parts, pharmaceutical items, aircraft components, and medical devices are increasingly using direct part mark (DPM) identification to ensure that the appropriate manufacturing processes are performed in the correct sequence and on the right parts. In addition, DPM is used to track parts from the beginning of their life to the end, and is also used in supply chain management and repair.

ID products are also used outside of the manufacturing sector to automate distribution processes in the logistics industry for applications in retail distribution and ecommerce to scan, track, and sort goods through distribution centers. Cognex offers the DataMan® product line of image-based barcode readers, which includes both hand-held and fixed-mount models, and barcode verifiers, as well as the MX Series of vision-enabled Mobile Terminals that allow

customers to leverage the latest mobile device technology for industrial barcode reading applications.

Research, Development, and Engineering

Cognex engages in research, development, and engineering (RD&E) to enhance our existing products and to develop new products and functionality to address market opportunities. In addition to internal research and development

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efforts, we intend to continue our strategy of gaining access to new technology through strategic relationships and acquisitions where appropriate.

As of December 31, 2018, Cognex employed 508 professionals in RD&E, many of whom are software developers. Cognex's RD&E expenses totaled \$116,445,000 in 2018, \$99,205,000 in 2017, and \$78,269,000 in 2016, or approximately 14%, 13%, and 15% of revenue, respectively. We believe that a continued commitment to RD&E activities is essential in order to maintain or achieve product leadership with our existing products and to provide innovative new product offerings, as well as to provide engineering support for large customers. In addition, we consider our ability to accelerate time-to-market for new products to be critical to our revenue growth. Therefore, we expect to continue to make significant RD&E investments in the future. At any point in time, we have numerous research and development projects underway. Although we target our annual RD&E spending to be between 10% and 15% of total revenue, this percentage is impacted by revenue levels and investing cycles.

Manufacturing and Order Fulfillment

Cognex's products are manufactured utilizing a turnkey operation whereby the majority of component procurement, system assembly, and initial testing are performed by third-party contract manufacturers. Cognex's primary contract manufacturer is located in Indonesia. The contract manufacturers use specified components sourced from a vendor list approved by Cognex and assembly/test documentation created and controlled by Cognex. Certain components are presently sourced from a single vendor that is selected based upon price and performance considerations. In the event of a supply disruption from a single-source vendor, these components may be purchased from alternative vendors. After the completion of initial testing, a fully assembled product from the contract manufacturers is routed to our facility in Cork, Ireland or Natick, Massachusetts, USA, where trained Cognex personnel load Cognex software onto the product and perform quality control procedures. Finished product for customers in the Americas is then shipped from our Natick, Massachusetts facility, while finished product for customers outside of the Americas is shipped from our Cork, Ireland facility.

Sales Channels and Support Services

Cognex sells its products through a worldwide direct sales force that focuses on the development of strategic accounts that generate or are expected to generate significant sales volume, as well as through a global network of integration and distribution partners. Our integration partners are experts in vision and complementary technologies that can provide turnkey solutions for complex automation projects using vision, and our distribution partners provide sales and local support to help Cognex reach the many prospects for our products in factories around the world.

As of December 31, 2018, Cognex's sales force consisted of 981 professionals, and our partner network consisted of 386 active integrators and authorized distributors. Sales engineers call directly on targeted accounts, with the assistance of application engineers, and manage the activities of our integration and distribution partners within their territories in order to provide an advantageous sales model for our products. The majority of our sales engineers are degreed engineers. Cognex has sales and support personnel located throughout the Americas, Europe, and Asia. Sales to customers based outside of the United States represented approximately 71% of total revenue in 2018 compared to approximately 76% of total revenue in 2017. In 2018, approximately 38% of our total revenue came from customers based in Europe, 16% from customers based in Greater China, 5% from customers based in Japan, and 12% from customers based in other regions outside the United States. Sales to customers based in Europe are denominated in Euros and U.S. Dollars, sales to customers based in Greater China are denominated in Yuan for sales within Mainland China and U.S. Dollars in other territories, sales to customers based in Japan are denominated in Yen, and sales to customers based in other regions are denominated in U.S. Dollars. Financial information about geographic areas may be found in Note 19 to the Consolidated Financial Statements, appearing in Part II - Item 8 of this Annual Report on Form 10-K.

Cognex's service offerings include maintenance and support, consulting, and training services. Maintenance and support programs include hardware support programs that entitle customers to have failed products repaired, as well as software support programs that provide customers with application support and software updates to the latest software releases. Application support is provided by technical support personnel located at Cognex regional offices, as well as by field service engineers that provide support at the customer's production site. We provide consulting services that range from a specific area of functionality to a completely integrated vision application or installed ID

application. Training services include a variety of product courses that are available at our offices worldwide, at customer facilities, and online at www.cognex.com.

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Intellectual Property

We rely on the technical expertise, creativity, and knowledge of our personnel, and therefore, we utilize patent, trademark, copyright, and trade secret protection to maintain our competitive position and protect our proprietary rights in our products and technology. While our intellectual property rights are important to our success, we believe that our business as a whole is not materially dependent on any particular patent, trademark, copyright, or other intellectual property right.

As of December 31, 2018, Cognex owned 640 patents issued worldwide and had another 490 patent applications pending worldwide. Cognex has used, registered, or applied to register a number of trademark registrations in the United States and in other countries. Cognex's trademark and servicemark portfolio includes various registered marks, including, among others, Cognex®, VisionPro®, In-Sight®, and DataMan®, as well as many common-law marks.

Compliance with Environmental Provisions

Cognex's capital expenditures, earnings, and competitive position are not materially affected by compliance with federal, state, and local environmental provisions which have been enacted or adopted to regulate the distribution of materials into the environment.

Competition

The machine vision market is highly fragmented and competitive. Our competitors include other vendors of machine vision systems, controllers, and components; manufacturers of image processing systems, sensors, and components; and system integrators. In addition, in the semiconductor and electronics capital equipment market, and with machine builders in the factory automation market, we compete with the internal engineering departments of current or prospective customers. In the identification and logistics markets, we compete with manufacturers of automatic identification systems. In the deep learning market, we compete with other industrially-focused machine vision companies, deep learning software companies, and engineering teams that use open source tools to solve applications. Key competitors in geographies worldwide include Keyence Corporation, Sick AG, Datalogic, and Omron Corporation. Any of these competitors may have greater financial and other resources than Cognex. Although we consider Cognex to be one of the leading machine vision companies in the world, reliable estimates of the machine vision market and the number and relative size of competitors are not readily available.

Cognex's ability to compete depends upon our ability to design, manufacture, and sell high-quality products, as well as our ability to develop new products and functionality that meet evolving customer requirements. The primary competitive factors affecting the choice of a machine vision or identification system include vendor reputation, product functionality and performance, ease of use, price, and post-sales support. The importance of each of these factors varies depending upon the specific customer's needs.

Backlog

As of December 31, 2018, backlog, which includes deferred revenue, totaled \$65,408,000, compared to \$42,186,000 as of December 31, 2017. Backlog reflects customer purchase orders for products scheduled for shipment primarily within 120 days for customers in the logistics industry and primarily within 60 days for customers in all other industries. The level of backlog at any particular date is not necessarily indicative of future revenue. Delivery schedules may be extended and orders may be canceled at any time subject to certain cancellation penalties.

Employees

As of December 31, 2018, Cognex employed 2,124 persons, including 1,246 in sales, marketing, and service activities; 508 in research, development, and engineering; 179 in manufacturing and quality assurance; and 191 in information technology, finance, and administration. Of our 2,124 employees, 1,251 are based outside of the United States. We have not experienced any work stoppages due to labor disputes. We believe that our employee relations are good.

Available Information

Cognex maintains a website on the World Wide Web at www.cognex.com. We make available, free of charge, on our website in the "Company" section under the caption "Investor Information" followed by "Financial Information" and then "SEC Filings," our Annual Report on Form 10-K, Quarterly Reports on Form 10-Q, and Current Reports on Form 8-K, including exhibits, and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended, as soon as reasonably practicable after such reports are electronically

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filed with, or furnished to, the SEC. Cognex's reports filed with, or furnished to, the SEC are also available at the SEC's website at www.sec.gov. Information contained on our website is not a part of, or incorporated by reference into, this Annual Report on Form 10-K.

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ITEM 1A: RISK FACTORS

The risks and uncertainties described below are not the only ones that we face. Additional risks and uncertainties that we are unaware of, or that we currently deem immaterial, also may become important factors that affect our company in the future. If any of these risks were to occur, our business, financial condition, or results of operations could be materially and adversely affected. This section includes or refers to certain forward-looking statements. We refer you to the explanation of the qualifications and limitations on such forward-looking statements, appearing under the heading "Forward-Looking Statements" in Part II - Item 7 of this Annual Report on Form 10-K.

The loss of a large customer could have an adverse effect on our business.

Revenue from a single customer accounted for 15%, 20%, and 17% of total revenue in 2018, 2017, and 2016, respectively. Large customers may divert management's attention from other operational matters and pull resources from other areas of the business, resulting in potential loss of revenue from other customers. In addition, large customers may receive preferred pricing and a higher level of post-sale support, which may lower our gross margin percentage. Furthermore, we typically extend credit terms to large customers, resulting in large accounts receivable balances, and in certain instances due to long supplier lead times, we may purchase inventory in advance of receipt of a customer purchase order, which exposes us to an increased risk of excess or obsolete inventory and resulting charges. In some cases, end customers of our resellers may be large consumers of our products. The loss of, or significant curtailment of purchases by, any one or more of our larger customers could have a material adverse effect on our operating results.

Global economic conditions may negatively impact our operating results.

Our revenue levels are impacted by global economic conditions, as we have a significant business presence in many countries throughout the world. If global economic conditions were to deteriorate, our revenue and our ability to generate operating profits could be materially adversely affected.

As a result of global economic conditions, our business is subject to the following risks, among others:

- our customers may not have sufficient cash flow or access to financing to purchase our products,
- our customers may not pay us within agreed upon terms or may default on their payments altogether,
- our vendors may be unable to fulfill their delivery obligations to us in a timely manner,
- lower demand for our products may result in charges for excess and obsolete inventory if we are unable to sell inventory that is either already on hand or committed to purchase,
- lower cash flows may result in impairment charges for acquired intangible assets or goodwill,
- a decline in our stock price may make stock options a less attractive form of compensation and a less effective form of retention for our employees, and
- the trading price of our common stock may be volatile.

As of December 31, 2018, the Company had \$798 million in cash and investments. In addition, Cognex has no long-term debt and we do not anticipate needing debt financing in the near future. We believe that our strong cash position puts us in a relatively good position to weather economic downturns. Nevertheless, our operating results have been materially adversely affected in the past, and could be materially adversely affected in the future, as a result of unfavorable economic conditions and reduced capital spending by manufacturers worldwide.

A downturn in the consumer electronics or automotive industries may adversely affect our business.

In 2018, the largest industries that we served in the factory automation market were the consumer electronics and automotive industries. Our business is impacted by the level of capital spending in these industries, as well as the product design cycles of our major customers in these industries. The market leaders in these industries are able to exert purchasing power over their vendors' supply chains, and our large customers in these industries may decide to purchase fewer products from Cognex or stop purchasing from Cognex altogether. As a result, our operating results could be materially and adversely affected by declining sales in these industries.

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Our inability to achieve growth in revenue and profits from our logistics business may negatively impact our operating results.

We are pursuing applications outside of the manufacturing sector to automate distribution processes in the logistics industry for applications in retail distribution and ecommerce to scan, track, and sort goods through distribution centers. Revenue from customers in the logistics industry grew over 50% in 2018, and our future growth plans are dependent upon continued growth in this industry. Our gross margin percentage in this industry is currently lower than our average gross margin percentage, as certain sales in this industry are for application-specific customer solutions that include deployment services. In addition, we are making significant investments in engineering and sales to further develop our logistics business. Over time, we expect our gross margin percentage in logistics to be more in line with our overall average. Failure to generate revenue in this industry in the amounts anticipated may have a material adverse impact on our revenue growth and operating results.

Economic, political, and other risks associated with international sales and operations could adversely affect our business and operating results.

In 2018, approximately 71% of our revenue was derived from customers located outside of the United States. We anticipate that international sales will continue to account for a significant portion of our revenue. In addition, we source components from suppliers located outside of the United States, including China, and utilize third-party contract manufacturers, primarily located in Indonesia, to assemble certain of our products. We intend to continue to expand our sales and operations outside of the United States and expand our presence in international emerging markets. As a result, our business is subject to the risks inherent in international sales and operations, including, among other things:

- various regulatory and statutory requirements,
- difficulties in injecting and repatriating cash,
- export and import restrictions,
- trade tariffs,
- transportation delays,
- employment regulations and local labor conditions,
- difficulties in staffing and managing foreign sales operations,
- instability in economic or political conditions, including potential adverse effects from Brexit,
- difficulties protecting intellectual property,
- business systems connectivity issues, and
- potentially adverse tax consequences.

Any of these factors could have a material adverse effect on our operating results. Most recently, trade tariffs imposed by the United States on certain components imported from Chinese suppliers have resulted in higher costs for our products. To date, these cost increases have been immaterial to our total cost of goods sold and primarily relate to components sourced in China for new products that we build in the United States in their infancy before they are moved to our contract manufacturer in Indonesia; however, cost increases as a result of trade tariffs could become material in the future. Trade tariffs may also have an indirect impact on the economic climate in China, which in turn, may have an impact on the Company's revenue from customers based in China. Further escalations of trade conflicts between the United States and China, or other countries where Cognex has operations, may have a material adverse effect on our gross margin. In addition to recent trade tariffs, if U.S. export controls expand to place new restrictions on the exportation of our products or a subset of our products, including, without limitation, any applicable regulations promulgated by the U.S. Commerce Department's Bureau of Industry and Security, such controls could have a material adverse effect on our operating results.

Fluctuations in foreign currency exchange rates and the use of derivative instruments to hedge these exposures could adversely affect our reported results, liquidity, and competitive position.

We face exposure to foreign currency exchange rate fluctuations, as a significant portion of our revenues, expenses, assets, and liabilities are denominated in currencies other than the functional currencies of our subsidiaries or the reporting currency of our company, which is the U.S. Dollar. In certain instances, we utilize forward contracts to hedge against foreign currency fluctuations. These contracts are used to minimize foreign currency gains or losses, as

the gains or losses on the derivative are intended to offset the losses or gains on the underlying exposure. We do not

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engage in foreign currency speculation. If the counterparty to any of our hedging arrangements experiences financial difficulties, or is otherwise unable to honor the terms of the contract, we may experience material losses.

Our foreign currency hedging program includes foreign currency cash flow hedges that protect our budgeted revenues and expenses against foreign currency exchange rate changes compared to our budgeted rates. These derivatives are designated for hedge accounting, and therefore, the effective portion of the forward contract's gain or loss is reported in shareholders' equity as other comprehensive income (loss) and is reclassified into current operations as the hedged transaction impacts current operations. Should these hedges fail to qualify for hedge accounting or be ineffective, the gain or loss on the forward contract would be reported in current operations immediately as opposed to when the hedged transaction impacts current operations, which may result in material foreign currency gains or losses.

The success of our foreign currency risk management program depends upon forecasts of transaction activity denominated in various currencies. To the extent that these forecasts are overstated or understated during periods of currency volatility, we could experience unanticipated foreign currency gains or losses that could have a material impact on our results of operations. Furthermore, our failure to identify new exposures and hedge them in an effective manner may result in material foreign currency gains or losses.

A significant portion of our revenues and expenses are denominated in the Euro, the Japanese Yen, and the Chinese Yuan, also known as Renminbi. Our predominant currency of sale is the U.S. Dollar in the Americas, the Euro and U.S. Dollar in Europe, the Yuan in Mainland China, the Yen in Japan, and the U.S. Dollar in other regions. We estimate that approximately 43% of our sales in 2018 were invoiced in currencies other than the U.S. Dollar, and we expect sales denominated in foreign currencies to continue to represent a significant portion of our total revenue.

While we also have expenses denominated in these same foreign currencies, the impact on revenues has historically been, and is expected to continue to be, greater than the offsetting impact on expenses. Therefore, in times when the U.S. Dollar strengthens in relation to these foreign currencies, we would expect to report a net decrease in operating income. Conversely, in times when the U.S. Dollar weakens in relation to these foreign currencies, we would expect to report a net increase in operating income. Thus, changes in the relative strength of the U.S. Dollar may have a material impact on our operating results.

Information security breaches or business system disruptions may adversely affect our business.

We rely on our information technology infrastructure and management information systems to effectively run our business. We may be subject to information security breaches caused by hacking, malicious software, or acts of vandalism or terrorism. Our security measures or those of our third-party service providers may not detect or prevent such breaches. Any such compromise to our information security could result in theft of our intellectual property, a misappropriation of our cash or other assets, an interruption in our operations, the unauthorized publication of our confidential business or proprietary information, the unauthorized release of customer, vendor, or employee data, the violation of privacy or other laws, and the exposure to litigation or regulatory penalties, any of which could harm our business and operating results.

In mid-2018, we placed into service a new Enterprise Resource Planning (ERP) system, which is the management information system that integrates our manufacturing, order fulfillment, and financial activities. Disruptions with our management information systems may cause significant business disruption, including our ability to process orders, ship products, invoice customers, process payments, and otherwise run our business. Any disruption occurring with our ERP system, or any of our other management information systems, may have a material adverse effect on our operating results.

Our business could suffer if we lose the services of, or fail to attract, key personnel.

We are highly dependent upon the management and leadership of Robert J. Shillman, our Chairman of the Board of Directors and Chief Culture Officer, and Robert J. Willett, our President and Chief Executive Officer, as well as other members of our senior management team. Although we have many experienced and qualified senior managers, the loss of key personnel could have a material adverse effect on our company.

We have historically used stock options as a key component of our employee compensation program in order to align employee interests with the interests of our shareholders, provide competitive compensation and benefits packages, and encourage employee retention. We are limited as to the number of options that we may grant under our stock option plans and stock price volatility may cause periods of time during which option exercise prices might be less

than the sales price of our common stock, which may lessen such options' retentive attributes. Accordingly, we may find it difficult to attract, retain, and motivate employees, and any such difficulties could materially adversely affect our business.

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If we fail to effectively manage our growth, our business and operating results could suffer.

To help support our growth plans, our headcount increased from 1,771 employees as of December 31, 2017 to 2,124 employees as of December 31, 2018. Although this represents a net headcount increase of 353 persons, the number of new employees that we hired and trained was higher due to workforce attrition. In addition, we currently utilize a large number of third-party contractors to provide on-site technical support and installation services.

To support our growth and execute on our operating plans and strategic initiatives, we must effectively attract, train, develop, motivate, and retain skilled employees, while maintaining our unique corporate culture. We believe our strong corporate culture is critical to our ability to collaborate, innovate, execute, and adapt in a high-growth, fast-changing business environment. We may not be able to hire and train new employees and contractors quickly enough to meet our business needs. If we fail to quickly adapt our hiring and training plans to our business levels or effectively execute on our hiring plans, our efficiency and ability to meet our operating goals could suffer.

Furthermore, employee productivity, morale, and retention could suffer, which may have a material adverse effect on our business and operating results.

Additionally, the growth and expansion of our business and product offerings place significant demand on our employees and, in particular, our management team. The growth of our business may require significant additional resources to meet these daily requirements, which may not scale in a cost-effective manner or may negatively impact our customers' experience. Effective management information systems, including our new Enterprise Resource Planning (ERP) system, and strong internal controls are also necessary to support our growth. If we are unable to manage the growth of our organization and business effectively, our operating results may be materially and adversely affected.

The failure of a key supplier to deliver quality product in a timely manner or our inability to obtain components for our products could adversely affect our operating results.

A significant portion of our product is manufactured by a third-party contractor located in Indonesia. This contractor has agreed to provide Cognex with termination notification periods and last-time-buy rights, if and when that may be applicable. We rely upon this contractor to provide quality product and meet delivery schedules. We engage in extensive product quality programs and processes, including actively monitoring the performance of our third-party manufacturers; however, we may not detect all product quality issues through these programs and processes.

Certain components are presently sourced from a single vendor that is selected based on price and performance considerations. In the event of a supply disruption from a single-source vendor, these components may be purchased from alternative vendors, which may result in manufacturing delays based on the lead time of the new vendor. Certain key electronic and mechanical components that are purchased from strategic suppliers, such as processors or imagers, are fundamental to the design of Cognex products. A disruption in the supply of these key components, such as a last-time-buy announcement, natural disaster, financial bankruptcy, or other event, may require us to purchase a significant amount of inventory at unfavorable prices resulting in lower gross margins and higher risk of carrying excess inventory.

We are subject to the requirements of the Dodd-Frank Wall Street Reform and Consumer Protection Act that obligates companies to inquire into the origin of conflict minerals in their supply chains. We are working with our supply chain partners to take reasonable steps to assure conflict minerals are not sourced by Cognex or our supply chain partners. These steps may include purchasing supply from alternative vendors. If we are unable to secure adequate supply from alternative vendors, we may have to redesign our products, which may lead to a delay in manufacturing and a possible loss of sales. Although we are taking certain actions to mitigate supply risk, an interruption in, termination of, or material change in the purchase terms of any key components could have a material adverse effect on our operating results.

Our failure to effectively manage product transitions or accurately forecast customer demand could result in excess or obsolete inventory and resulting charges.

Because the market for our products is characterized by rapid technological advances, we frequently introduce new products with improved ease-of-use, improved hardware performance, additional software features and functionality, or lower cost that may replace existing products. Among the risks associated with the introduction of new products are difficulty predicting customer demand and effectively managing inventory levels to ensure adequate supply of the new

product and avoid excess supply of the legacy product.

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We may strategically enter into non-cancelable commitments with vendors to purchase materials for our products in advance of demand to take advantage of favorable pricing, address concerns about the availability of future supplies, or build safety stock to help ensure customer shipments are not delayed should we experience higher than anticipated demand for materials with long lead times. In 2018, inventories increased 23% from \$67,923,000 as of December 31, 2017 to \$83,282,000 as of December 31, 2018, primarily due to strategic purchases to build safety stock in advance of the Company's Enterprise Resource Planning (ERP) system implementation and to mitigate our exposure to significant increases in demand similar to what we experienced in 2017. These measures to purchase inventory may expose us to an increased risk of excess or obsolete inventory and resulting charges if actual demand is lower than anticipated. Our failure to effectively manage product transitions or accurately forecast customer demand, in terms of both volume and configuration, has led to, and may again in the future lead to, an increased risk of excess or obsolete inventory and resulting charges.

Our products may contain design or manufacturing defects, which could result in reduced demand, significant delays, or substantial costs.

If flaws in either the design or manufacture of our products were to occur, we could experience a rate of failure in our products that could result in significant delays in shipment and material repair or replacement costs. Our release-to-market process may not be robust enough to detect significant design flaws or software bugs. While we engage in extensive product quality programs and processes, including actively monitoring and evaluating the quality of our component suppliers and contract manufacturers, these actions may not be sufficient to avoid a product failure rate that results in:

- substantial delays in shipment,
- significant repair or replacement costs,
- product liability claims or lawsuits, particularly in connection with life sciences customers or other high-risk end-user industries, or
- potential damage to our reputation.

Any of these results could have a material adverse effect on our operating results.

Our failure to introduce new products in a successful and timely manner could result in the loss of our market share and a decrease in our revenues and profits.

The market for our products is characterized by rapidly changing technology. Accordingly, we believe that our future success will depend upon our ability to accelerate time-to-market for new products with improved functionality, ease-of-use, performance, or price. There can be no assurance that we will be able to introduce new products in accordance with scheduled release dates or that new products will achieve market acceptance. Our inability to keep pace with the rapid rate of technological change in the high-technology marketplace could have a material adverse effect on our operating results.

Product development is often a complex, time-consuming, and costly process involving significant investment in research and development with no assurance of return on investment. Our strong balance sheet allows us to continue to make significant investments in research, development, and marketing for new products and technologies. Research is by its nature speculative and the ultimate commercial success of a product depends upon various factors, many of which are not under our control. We may not achieve significant revenue from new product investments for a number of years, if at all. Moreover, new products may not generate the gross margins that we have experienced historically. Our failure to properly manage the distribution of our products and services could result in the loss of revenues and profits.

We utilize a direct sales force, as well as a network of integration and distribution partners, to sell our products and services. Successfully managing the interaction of our direct and indirect sales channels to reach various potential customers for our products and services is a complex process. In addition, our reliance upon indirect selling methods may reduce visibility to demand and pricing issues. Each sales channel has distinct risks and costs, and therefore, our failure to implement the most advantageous balance in the sales model for our products and services could adversely affect our revenue and profitability.

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If we fail to successfully protect our intellectual property, our competitive position and operating results could suffer. We rely on our proprietary software technology and hardware designs, as well as the technical expertise, creativity, and knowledge of our personnel to maintain our position as a leading provider of machine vision products. Software piracy and reverse engineering, specifically from companies in Russia and China, may result in counterfeit products that are misrepresented in the market as Cognex products. Although we use a variety of methods to protect our intellectual property, we rely most heavily on patent, trademark, copyright, and trade secret protection, as well as non-disclosure agreements with customers, suppliers, employees, and consultants. We also attempt to protect our intellectual property by restricting access to our proprietary information by a combination of technical and internal security measures. These measures, however, may not be adequate to:

- protect our proprietary technology,
- protect our patents from challenge, invalidation, or circumvention, or
- ensure that our intellectual property will provide us with competitive advantages.

Our pending and future patent applications may not issue as patents or, if issued, may not issue in a form that will provide us with any meaningful protection or any competitive advantage. Even if issued, existing or future patents may be challenged, narrowed, invalidated, or circumvented, which could limit our ability to stop competitors from developing and marketing similar products or limit the length of patent protection we may have for our products. Furthermore, other companies may design around technologies we have patented, licensed, or developed. Moreover, changes in patent laws or their interpretation in the United States and other countries could also diminish the value of our intellectual property or narrow the scope of our patent protection. In addition, the legal systems of certain countries do not favor the aggressive enforcement of patents, and the laws of foreign countries may not protect our rights to the same extent as the laws of the United States. As a result, our patent portfolio may not provide us with sufficient rights to exclude others from commercializing products similar to ours. Any of these adverse circumstances could have a material adverse effect on our operating results.

Our Company may be subject to time-consuming and costly litigation.

From time to time, we may be subject to various claims and lawsuits by competitors, shareholders, customers, or other parties arising in the ordinary course of business, including lawsuits charging patent infringement, or claims and lawsuits instituted by us to protect our intellectual property or for other reasons. We may be a party to actions that are described in the section captioned “Legal Proceedings,” appearing in Part I - Item 3 of this Annual Report on Form 10-K. These matters can be time consuming, divert management’s attention and resources, and cause us to incur significant expenses. Furthermore, the results of any of these actions may have a material adverse effect on our operating results.

Increased competition may result in decreased demand or prices for our products and services.

The machine vision market is highly fragmented and competitive. Our competitors include other vendors of machine vision systems, controllers, and components; manufacturers of image processing systems, sensors, and components; and system integrators. We may also compete with internal engineering departments of current or prospective customers. Any of these competitors may have greater financial and other resources than we do. We may not be able to compete successfully in the future and our investments in research and development, sales and marketing, and support activities may be insufficient to enable us to maintain our competitive advantage. In addition, competitive pressures could lead to price erosion that could have a material adverse effect on our gross margins and operating results. We refer you to the section captioned “Competition,” appearing in Part I - Item 1 of this Annual Report on Form 10-K for further information regarding the competition that we face.

Implementation of our acquisition strategy may not be successful, which could affect our ability to increase our revenue or profitability and result in the impairment of acquired intangible assets.

We have in the past acquired, and will in the future consider the acquisition of, businesses and technologies in the machine vision industry. Our business may be negatively impacted by risks related to those acquisitions. These risks include, among others:

- the inability to find or close attractive acquisition opportunities,
- the diversion of management’s attention from other operational matters,

the inability to realize expected synergies resulting from the acquisition,
difficulties or delays in integrating the personnel, operations, technologies, products and systems of acquired
businesses,
the failure to retain key customers or employees, and

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the impairment of acquired intangible assets resulting from lower-than-expected cash flows from the acquired assets. Acquisitions are inherently risky and the inability to effectively manage these risks could have a material adverse effect on our operating results.

We are at risk for impairment charges with respect to our investments or for acquired intangible assets or goodwill, which could have a material adverse effect on our results of operations.

As of December 31, 2018, our investment portfolio of debt securities totaled \$689 million. These debt securities are reported at fair value, with unrealized gains and losses, net of tax, recorded in shareholders' equity as other comprehensive income (loss) since these securities are designated as available-for-sale securities. As of December 31, 2018, our portfolio of debt securities had a net unrealized loss of \$1,932,000. Included in this net loss, were gross unrealized losses totaling \$2,255,000, of which \$1,445,000 were in a loss position for less than twelve months and \$810,000 were in a loss position for greater than twelve months. As of December 31, 2018, these unrealized losses were determined to be temporary. However, if conditions change and future unrealized losses were determined to be other-than-temporary, we would be required to record an impairment charge.

Management monitors the carrying value of its debt securities compared to their fair value to determine whether an other-than-temporary impairment has occurred. In considering whether a decline in fair value is other-than-temporary, we consider many factors, both qualitative and quantitative. Management considers the type of security, the credit rating of the security, the length of time the security has been in a loss position, the size of the loss position, our ability and intent to hold the security to expected recovery of value, and other meaningful information. If a decline in fair value is determined to be other-than-temporary, an impairment charge would be recorded in current operations to reduce the carrying value of the investment to its fair value. Should the fair value of investments decline in future periods below their carrying value, management will need to determine whether this decline is other-than-temporary and future impairment charges may be required.

As of December 31, 2018, we had \$113 million in acquired goodwill. The fair value of goodwill is susceptible to changes in the fair value of the reporting segment in which the goodwill resides, and therefore, a decline in our market capitalization or cash flows relative to our net book value may result in future impairment charges.

As of December 31, 2018, we had \$10 million in acquired intangible assets, consisting primarily of acquired completed technologies and customer relationships. These assets are susceptible to changes in fair value due to a decrease in the historical or projected cash flows from the use of the asset, which may be negatively impacted by economic trends. A decline in the cash flows generated by these assets may result in future impairment charges. If we determine that any of these investments, goodwill, or intangible assets is impaired, we would be required to take a related charge to earnings that could have a material adverse effect on our results of operations.

We may have additional tax liabilities, which could adversely affect our operating results and financial condition.

We are subject to income taxes in the United States, as well as numerous foreign jurisdictions. Significant judgment is required in determining our worldwide provision for income taxes. In the ordinary course of business, there are many transactions and calculations where the ultimate tax determination is uncertain. We are regularly under audit by tax authorities. Although we believe our tax positions are reasonable, the final determination of tax audits and any related litigation could be materially different than that which is reflected in our financial statements and could have a material adverse effect on our income tax provision, net income, or cash flows in the period in which the determination is made.

On December 22, 2017, the Tax Cuts and Jobs Act of 2017 (Tax Act) was signed into law. The Tax Act included a decrease in the U.S. federal statutory corporate tax rate from 35% to 21%, a one-time transition tax, and limits on certain deductions. The Securities and Exchange Commission (SEC) released Staff Accounting Bulletin (SAB) No. 118 to provide guidance to companies on how to implement the accounting and disclosure changes required as a result of the Tax Act. The Company made what it considered to be a reasonable estimate of the impact of the Tax Act in its financial statements for the year ended December 31, 2017. In 2018, the Company revised its estimate of the impact of the Tax Act based on additional regulatory guidance.

The Company will continue to gather and analyze information on historical unrepatriated foreign earnings and to monitor state laws relating to this income to finalize both the federal and state tax impact. The Tax Act limits certain deductions and these limitations may impact the value of existing deferred tax assets. The Company will continue to

review the impact of these limitations as regulatory guidance is issued.

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ITEM 1B: UNRESOLVED STAFF COMMENTS

None

ITEM 2: PROPERTIES

In 1994, Cognex purchased and renovated a 100,000 square-foot building located in Natick, Massachusetts that serves as our corporate headquarters and is occupied by employees primarily in research, development, and engineering, manufacturing and quality assurance, and administration functions. In 1997, Cognex completed construction of a 50,000 square-foot addition to this building.

In 1995, Cognex purchased an 83,000 square-foot office building adjacent to our corporate headquarters that is partially occupied by employees primarily in sales, marketing, service, finance, and information technology functions. In 1997, Cognex purchased a three and one-half acre parcel of land adjacent to our corporate headquarters. This land is being held for future expansion.

In 2007, Cognex purchased a 19,000 square-foot building adjacent to our corporate headquarters. A portion of this facility serves as the distribution center for customers in the Americas. The remainder of this building is occupied by a tenant who has a lease agreement that expires in 2022.

In 2014, Cognex purchased a 50,000 square foot building in Cork, Ireland where we had previously leased space for several years. This facility serves as the distribution center for customers outside of the Americas.

Cognex conducts certain of its operations in leased facilities. These lease agreements expire at various dates through 2025. Certain of these leases contain renewal options, retirement obligations, escalation clauses, rent holidays, and leasehold improvement incentives.

ITEM 3: LEGAL PROCEEDINGS

Various claims and legal proceedings generally incidental to the normal course of business are pending or threatened on behalf of or against the Company. While we cannot predict the outcome of these matters, we believe that any liability arising from them will not have a material adverse effect on our financial position, liquidity, or results of operations.

ITEM 4: MINE SAFETY DISCLOSURES

Not applicable.

ITEM 4A: EXECUTIVE OFFICERS OF THE REGISTRANT

The following table sets forth the names, ages, and titles of Cognex's executive officers as of December 31, 2018:

Name	Age	Title
Robert J. Shillman	72	Chairman of the Board of Directors and Chief Culture Officer
Robert J. Willett	51	President and Chief Executive Officer
John J. Curran	52	Senior Vice President of Finance and Chief Financial Officer
Sheila M. DiPalma	52	Senior Vice President of Employee Services

Executive officers are elected annually by the Board of Directors. There are no family relationships among the directors and executive officers of the Company.

Dr. Shillman and Mr. Willett have been employed by Cognex in their current positions for no less than the past five years.

Mr. Curran joined Cognex in 2016 after 21 years at EMC Corporation, a company that manages business involved in the transformation of information technology, where he most recently served as Senior Vice President and Corporate Controller. While at EMC, Mr. Curran also held leadership positions in corporate and international finance, and served as Interim CFO of Pivotal, Inc., a \$200M subsidiary of EMC focusing on application and data infrastructure software, agile development services, and data science consulting. He holds a Bachelor of Science degree in Accounting and a Master of Business Administration from Babson College.

Ms. DiPalma joined Cognex in 1992 as Senior Reporting Accountant. She served for more than 20 years in a series of increasingly responsible roles in the finance function, including six years as Cognex Treasurer, before transitioning to Employee Services in 2016. Prior to joining Cognex, Ms. DiPalma was a member of the audit firm PricewaterhouseCoopers. She holds a Bachelor of Science degree in Accounting from Boston College, a Master of Science degree in Taxation from Bentley College, and is a Certified Public Accountant.

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PART II

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

The Company's common stock is traded on The NASDAQ Stock Market LLC, under the symbol CGNX. As of January 27, 2019, there were approximately 700 shareholders of record of the Company's common stock. The Company believes the number of beneficial owners of the Company's common stock on that date was substantially greater.

In February 2018, the Company's Board of Directors authorized the repurchase of \$150,000,000 of the Company's common stock. During the fourth quarter of 2018, the Company repurchased 1,227,000 shares at a cost of \$52,938,000 under this program. Stock repurchases under this February 2018 program are now complete. In October 2018, the Company's Board of Directors authorized the repurchase of \$200,000,000 of the Company's common stock. As of December 31, 2018, the Company repurchased 203,000 shares at a cost of \$8,622,000 under this program, leaving a remaining balance of \$191,378,000. The Company may repurchase shares under this program in future periods depending upon a variety of factors, including, among other things, the impact of dilution from employee stock options, stock price, share availability, and cash requirements.

The following table sets forth information with respect to purchases by the Company of shares of its common stock during the fourth quarter of 2018:

	Total Number of Shares Purchased	Average Price Paid per Share	Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs	Approximate Dollar Value of Shares that May Yet Be Purchased Under the Plans or Programs
October 1 - October 28, 2018	—	\$ —	—	\$ 252,938,000
October 29 - November 25, 2018	937,000	43.62	937,000	212,064,000
November 26 - December 31, 2018	493,403	41.92	493,403	191,378,000
Total	1,430,403	\$ 43.04	1,430,403	\$ 191,378,000

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Set forth below is a line graph comparing the annual percentage change in the cumulative total shareholder return on the Company’s common stock, based upon the market price of the Company’s common stock, with the total return on companies within the Nasdaq Composite Index and the Research Data Group, Inc. Nasdaq Lab Apparatus & Analytical, Optical, Measuring & Controlling Instrument (SIC 3820-3829 US Companies) Index (the “Nasdaq Lab Apparatus Index”). The performance graph assumes an investment of \$100 in each of the Company and the two indices, and the reinvestment of any dividends. The historical information set forth below is not necessarily indicative of future performance. Data for the Nasdaq Composite Index and the Nasdaq Lab Apparatus Index was provided to the Company by Research Data Group, Inc.

*\$100 invested on 12/31/2013 in stock or index, including reinvestment of dividends. Fiscal year ended December 31.

	12/13	12/14	12/15	12/16	12/17	12/18
Cognex Corporation	100.00	108.25	88.92	168.58	325.21	206.41
NASDAQ Composite	100.00	114.62	122.81	133.19	172.11	165.84
NASDAQ Stocks (SIC 3820-3829 U.S. Companies) Lab Apparatus & Analyt,Opt, Measuring, and Controlling Instrument	100.00	127.06	127.05	131.44	195.46	183.84

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ITEM 6: SELECTED FINANCIAL DATA

	Year Ended December 31,				
	2018	2017	2016	2015	2014
	(In thousands, except per share amounts)				
Statement of Operations Data:					
Revenue	\$806,338	\$766,083	\$529,515	\$470,991	\$461,006
Cost of revenue (1)	206,052	187,289	131,070	123,085	120,992
Gross margin	600,286	578,794	398,445	347,906	340,014
Research, development, and engineering expenses (1)	116,445	99,205	78,269	69,791	55,831
Selling, general, and administrative expenses (1)	262,699	220,728	166,110	156,674	148,699
Operating income	221,142	258,861	154,066	121,441	135,484
Non-operating income	13,432	7,603	8,011	5,441	3,904
Income from continuing operations before income tax expense	234,574	266,464	162,077	126,882	139,388
Income tax expense on continuing operations	15,307	89,752	18,128	19,288	21,869
Net income from continuing operations	219,267	176,712	143,949	107,594	117,519
Net income (loss) from discontinued operations (1)	—	—	(255)	79,410	10,644
Net income	\$219,267	\$176,712	\$143,694	\$187,004	\$128,163
Basic earnings per weighted-average common and common-equivalent share (2):					
Net income from continuing operations	\$1.27	\$1.02	\$0.84	\$0.62	\$0.68
Net income (loss) from discontinued operations	\$—	\$—	\$—	\$0.46	\$0.06
Net income	\$1.27	\$1.02	\$0.84	\$1.08	\$0.74
Diluted earnings per weighted-average common and common-equivalent share (2):					
Net income from continuing operations	\$1.24	\$0.98	\$0.83	\$0.61	\$0.66
Net income (loss) from discontinued operations	\$—	\$—	\$—	\$0.45	\$0.06
Net income	\$1.24	\$0.98	\$0.83	\$1.06	\$0.72
Weighted-average common and common-equivalent shares outstanding (2):					
Basic	172,333	173,287	170,676	172,592	173,716
Diluted	177,406	179,551	174,144	175,982	178,142
Cash dividends per common share (2)	\$0.1850	\$0.1675	\$0.1475	\$0.1050	\$—
(1) Amounts include stock-based compensation expense, as follows:					
Cost of revenue	\$2,447	\$1,881	\$1,052	\$1,515	\$1,116
Research, development, and engineering	14,578	11,022	6,271	5,194	3,709
Selling, general, and administrative	24,065	19,039	13,235	13,032	9,234
Discontinued operations	—	—	—	1,533	1,099
Total stock-based compensation expense	\$41,090	\$31,942	\$20,558	\$21,274	\$15,158

(2) Prior period results have been adjusted to reflect the two-for-one stock split effected in the form of a stock dividend which occurred in 2017.

	December 31,				
	2018	2017	2016	2015	2014

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(In thousands)

Balance Sheet Data:

Working capital	\$688,969	\$517,356	\$461,357	\$397,470	\$188,986
Total assets	1,289,667	1,287,753	1,038,361	877,421	821,399
Shareholders' equity	1,135,263	1,095,673	963,385	832,331	743,171

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

FORWARD-LOOKING STATEMENTS

Certain statements made in this report, as well as oral statements made by the Company from time to time, constitute forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended. Readers can identify these forward-looking statements by our use of the words "expects," "anticipates," "estimates," "believes," "projects," "intends," "plans," "will," "may," "could," "should," and similar words and other statements of a similar sense. These statements are based upon our current estimates and expectations as to prospective events and circumstances, which may or may not be in our control and as to which there can be no firm assurances given. These forward-looking statements, which include statements regarding business and market trends, future financial performance, customer order rates and timing of related revenue, expected areas of growth, emerging markets, future product mix, research and development activities, investments, strategic plans, dividends, stock repurchases, and tax matters, involve known and unknown risks and uncertainties that could cause actual results to differ materially from those projected. Such risks and uncertainties include: (1) the loss of a large customer; (2) current and future conditions in the global economy, including the imposition of tariffs or export controls; (3) the reliance on revenue from the consumer electronics or automotive industries; (4) the inability to penetrate new markets; (5) the inability to achieve significant international revenue; (6) fluctuations in foreign currency exchange rates and the use of derivative instruments; (7) information security breaches or business system disruptions; (8) the inability to attract and retain skilled employees; (9) the failure to effectively manage our growth; (10) the reliance upon key suppliers to manufacture and deliver critical components for our products; (11) the failure to effectively manage product transitions or accurately forecast customer demand; (12) the inability to design and manufacture high-quality products; (13) the technological obsolescence of current products and the inability to develop new products; (14) the failure to properly manage the distribution of products and services; (15) the inability to protect our proprietary technology and intellectual property; (16) our involvement in time-consuming and costly litigation; (17) the impact of competitive pressures; (18) the challenges in integrating and achieving expected results from acquired businesses; (19) potential impairment charges with respect to our investments or for acquired intangible assets or goodwill; and (20) exposure to additional tax liabilities. The foregoing list should not be construed as exhaustive and we encourage readers to refer to the detailed discussion of risk factors included in Part I - Item 1A of this Annual Report on Form 10-K. The Company cautions readers not to place undue reliance upon any such forward-looking statements, which speak only as of the date made. The Company disclaims any obligation to subsequently revise forward-looking statements to reflect the occurrence of anticipated or unanticipated events or circumstances after the date such statements are made.

EXECUTIVE OVERVIEW

Cognex Corporation is a leading worldwide provider of machine vision products that capture and analyze visual information in order to automate tasks, primarily in manufacturing processes, where vision is required. In addition to product revenue derived from the sale of machine vision products, the Company also generates revenue by providing maintenance and support, consulting, and training services to its customers; however, service revenue accounted for less than 10% of total revenue for all periods presented.

Cognex machine vision is primarily used to automate manufacturing and distribution processes in a variety of industries, where the technology is widely recognized as an important component of automated production and quality assurance. Virtually every manufacturer can achieve better quality and manufacturing efficiency by using machine vision, and therefore, Cognex products are used by a broad base of customers across a variety of industries, including consumer electronics, automotive, consumer products, food and beverage, pharmaceuticals, and medical devices. Cognex products are also used outside of the manufacturing sector to automate distribution processes in the logistics industry for applications in retail distribution and ecommerce to scan, track, and sort goods through distribution centers.

On January 1, 2018, the Company adopted Accounting Standards Codification (ASC) 606, "Revenue from Contracts with Customers," using the full retrospective method to present all periods reported on a consistent basis. Accordingly, prior period revenue, cost of revenue, and gross profit have been restated to apply the provisions of this ASC.

Revenue for the year ended December 31, 2018 totaled \$806,338,000, representing an increase of 5% over 2017. Lower revenue from customers in the consumer electronics industry was offset by higher revenue across a variety of other industries, including the logistics and automotive industries. Gross margin was 74.4% of revenue in 2018 compared to 75.6% of revenue in 2017 due primarily to a higher percentage of total revenue from the logistics industry, which currently has relatively lower gross margins. Operating expenses increased by 19% over 2017 due principally to the impact of headcount additions to support our future growth plans. Operating income decreased to 27% of revenue in 2018 from 34% of revenue in 2017, however net income increased to 27% of revenue in 2018 from 23% of revenue in 2017 due to a significantly lower effective tax rate. Income tax expense in 2017 included a one-time tra

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transition tax on unrepatriated foreign earnings under the Tax Cuts and Jobs Act signed into law on December 22, 2017. Net income per diluted share increased to \$1.24 in 2018 from \$0.98 in 2017.

The following table sets forth certain consolidated financial data for continuing operations as a percentage of revenue:

	Year Ended		
	December 31,		
	2018	2017	2016
	100%	100%	100%
Revenue			
Cost of revenue	26	24	25
Gross margin	74	76	75
Research, development, and engineering expenses	14	13	15
Selling, general, and administrative expenses	33	29	31
Operating income	27	34	29
Non-operating income	2	1	2
Income from continuing operations before income tax expense	29	35	31
Income tax expense on continuing operations	2	12	4
Net income from continuing operations	27 %	23 %	27 %

RESULTS OF OPERATIONS

As foreign currency exchange rates are a factor in understanding period-to-period comparisons, we believe the presentation of results on a constant-currency basis in addition to reported results helps improve investors' ability to understand our operating results and evaluate our performance in comparison to prior periods. We also use results on a constant-currency basis as one measure to evaluate our performance. Constant-currency information compares results between periods as if exchange rates had remained constant period-over-period. We generally refer to such amounts calculated on a constant-currency basis as excluding the impact of foreign currency exchange rate changes. Results on a constant-currency basis are not in accordance with accounting principles generally accepted in the United States of America (U.S. GAAP) and should be considered in addition to, and not as a substitute for, results prepared in accordance with U.S. GAAP.

Year Ended December 31, 2018 Compared to Year Ended December 31, 2017

Revenue

Revenue for the year ended December 31, 2018 was \$806,338,000 compared to \$766,083,000 for the prior year, representing an increase of \$40,255,000, or 5%. Revenue in 2018 was impacted by lower sales in the consumer electronics industry primarily due to significantly lower revenue from a few large customers in OLED (organic light-emitting diode) display and smartphone manufacturing following a high level of investment from these customers in 2017. Excluding sales to customers in the consumer electronics industry, revenue increased by approximately 18% from the prior year, driven by growth in the logistics industry of over 50%. Changes in foreign currency exchange rates accounted for approximately 2% of the revenue increase from 2017 to 2018, primarily related to the translation of Euro-denominated and Chinese Yuan-denominated revenue to U.S. Dollars.

Revenue from customers based in the Americas increased by 25% from the prior year driven by strong sales in the logistics industry. Revenue from customers based in Greater China increased by 16% from 2017, although this business was relatively flat in the fourth quarter of 2018 over the fourth quarter of 2017. Revenue from customers based in Europe decreased by 6% and revenue from customers based in other Asia regions decreased by 8% from the prior year. Revenue for both the Europe and Asia regions outside of Greater China was impacted by the lower sales in the consumer electronics industry noted above.

As of the date of this report, we expect revenue for the first quarter of 2019 to be lower than the fourth quarter of 2018. In addition to the sequential decrease in revenue we typically experience in the first quarter as many manufacturing customers spend their capital budgets by the calendar year end, we are experiencing slower order trends in the automotive industry in the Americas and lower demand from customers based in Greater China.

Gross Margin

Gross margin as a percentage of revenue was 74.4% in 2018 compared to 75.6% in 2017. The decrease in gross margin was due primarily to a higher percentage of total revenue from the logistics industry. Certain sales in this

industry are for application-specific customer solutions, which typically have lower gross margins due to deployment services. Unfavorable product mix for sales in the logistics industry also contributed to the lower gross margin percentage.

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The Company's gross margin percentage has ranged in the mid 70s for the past several years. As of the date of this report, we expect the gross margin percentage for the first quarter of 2019 to continue to be within this historical range, but toward the lower end of this range due to anticipated unfavorable product mix toward sales in the logistics industry.

Operating Expenses

Research, Development, and Engineering Expenses

Research, development, and engineering (RD&E) expenses in 2018 increased by \$17,240,000, or 17%, from the prior year as detailed in the table below (in thousands).

RD&E expenses in 2017	\$99,205
Personnel-related costs	10,173
Stock-based compensation expense	3,493
Other	3,574
RD&E expenses in 2018	\$116,445

RD&E expenses increased due to higher personnel-related costs resulting primarily from headcount additions to support new product initiatives. Stock-based compensation expense was higher than the prior year due to a higher valuation of stock options granted, as well as a decrease in the estimated forfeiture rate in 2018.

RD&E expenses as a percentage of revenue were 14% in 2018 compared to 13% in 2017. We believe that a continued commitment to RD&E activities is essential in order to maintain or achieve a leadership position for our existing products and to provide innovative new product offerings, as well as to provide engineering support for strategic customers. In addition, we consider our ability to accelerate time to market for new products to be critical to our revenue growth. Therefore, we expect to continue to make significant RD&E investments in the future, and we target our annual RD&E spending to be between 10% and 15% of revenue. This percentage is impacted by revenue levels and investing cycles.

Selling, General, and Administrative Expenses

Selling, general, and administrative (SG&A) expenses in 2018 increased by \$41,971,000, or 19%, from the prior year as detailed in the table below (in thousands).

SG&A expenses in 2017	\$220,728
Personnel-related costs	36,569
Stock-based compensation expense	4,912
Depreciation expense	3,744
Incentive compensation plans	(7,967)
Other	4,713
SG&A expenses in 2018	\$262,699

SG&A expenses increased due to higher personnel-related costs resulting primarily from headcount additions, principally sales personnel. In addition to salaries and fringe benefits, these personnel-related costs included sales commissions and travel expenses related to the additional headcount. Stock-based compensation expense was higher than the prior year due to a higher valuation of stock options granted, as well as a decrease in the estimated forfeiture rate in 2018. Depreciation expense increased from the prior year due primarily to information technology investments in infrastructure, security, and business applications, including a new Enterprise Resource Planning (ERP) system that was placed into service in the middle of 2018. Offsetting these increases were lower expenses related to incentive compensation plans, including company bonuses and sales commissions, resulting from lower levels of achievement on performance plans that were set at the beginning of the year.

Non-operating Income (Expense)

The Company recorded foreign currency losses of \$1,064,000 in 2018 and \$1,601,000 in 2017. The foreign currency gains and losses result primarily from the revaluation and settlement of accounts receivable, accounts payable, and intercompany balances that are reported in one currency and collected or paid in another.

Investment income increased by \$5,173,000, or 54%, from the prior year. The increase was primarily due to higher yields on the Company's portfolio of debt securities.

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The Company recorded other expense of \$219,000 in 2018 and \$338,000 in 2017. Other income (expense) includes fair value adjustments of contingent consideration liabilities arising from business acquisitions, as well as rental income, net of associated expenses, from leasing space in buildings adjacent to the Company's corporate headquarters.

Income Tax Expense

The Company's effective tax rate was 7% of the Company's pre-tax income in 2018 compared to 34% in 2017.

The Tax Act

On December 22, 2017, the Tax Cuts and Jobs Act of 2017 (Tax Act) was signed into law. The Tax Act resulted in a decrease in the U.S. federal statutory corporate tax rate from 35% to 21%. As a result of the reduction in anticipated tax rate, the Company remeasured its deferred tax positions as of December 31, 2017 at the new enacted tax rate, and accordingly, recorded tax expense of \$12,523,000 in 2017 from the associated write-down of its deferred tax assets. In 2018, the Company recorded an increase in tax expense of \$3,240,000 from the write-down of its deferred tax assets primarily relating to guidance under the Tax Act regarding stock-based compensation.

The Tax Act subjects unrepatriated foreign earnings to a one-time transition tax, regardless of the Company's financial statement assertion related to indefinite reinvestment or whether the Company ultimately repatriates any of the foreign earnings, for which the Company recorded estimated tax expense of \$101,379,000 in 2017. In 2018, the Company revised its estimate of the one-time transition tax and recorded a decrease in tax expense of \$11,028,000, which resulted in a revised estimate for the one-time transition tax of \$90,351,000 payable over eight years.

The Tax Act replaces the current system of taxing U.S. corporations on repatriated foreign earnings with a partial territorial system that provides a 100% dividends-received deduction to domestic corporations for foreign-source dividends received from 10% or more owned foreign corporations. The Company recorded a decrease in tax expense of \$3,843,000 in 2017 from the reversal of the tax effect of a 2016 dividend paid in 2017 from a wholly-owned foreign subsidiary to its domestic entity.

The Company will continue to gather and analyze information on historical unrepatriated foreign earnings and monitor state laws relating to this income to finalize both the federal and state tax impact. The Tax Act limits certain deductions and these limitations may impact the value of existing deferred tax assets. The Company will continue to review the impact of these limitations as regulatory guidance is issued.

Other Discrete Tax Items

The effective tax rate also included a decrease in tax expense of \$8,488,000 in 2018, \$38,569,000 in 2017, and \$11,889,000 in 2016 from the excess tax benefit arising from the difference between the deduction for tax purposes and the compensation cost recognized for financial reporting purposes from stock option exercises. The Company cannot predict the level of stock option exercises by employees in future periods.

In 2018, tax expense included a provision for state income taxes of \$620,000 from a change in management's financial statement assertion related to the indefinite reinvestment of foreign earnings. Management has determined that earnings from its legal entity in China will remain indefinitely reinvested to provide sufficient local funding for growth, and that earnings from all other jurisdictions will not be indefinitely reinvested resulting in the additional state income tax provision.

Other discrete tax events resulted in a net decrease in tax expense of \$2,467,000 in 2018 and a net decrease in tax expense of \$2,502,000 in 2017, consisting primarily of i) the final true-up of the prior year's tax accrual upon filing the related tax returns and ii) the expiration of the statutes of limitations for certain reserves for income tax uncertainties.

Excluding the impact of these discrete tax events, the Company's effective tax rate was 14% in 2018.

The Company is tax resident in numerous jurisdictions around the world and has identified its major tax jurisdictions as the United States, Ireland, and China. The statutory tax rate is 12.5% in Ireland and 25% in China, compared to the U.S. federal statutory corporate tax rate of 21%. International rights to certain of the Company's intellectual property are held by a subsidiary whose legal jurisdiction does not tax this income, resulting in a foreign effective tax rate lower than the above mentioned statutory rates.

Year Ended December 31, 2017 Compared to Year Ended December 31, 2016

Revenue

Revenue for the year ended December 31, 2017 increased by \$236,568,000, or 45%, from the prior year. Changes in foreign currency exchange rates did not have a material impact on revenue. Revenue increased by 32% in the

Americas, 43% in Europe, and 63% in Asia due to a higher volume of machine vision products sold in all regions. Although the increase in revenue came from a variety of industries, strong sales in the logistics industry was a large

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contributor to the growth in the Americas and strong sales in the consumer electronics industry was a large contributor to the growth in Europe and Asia.

Gross Margin

Gross margin as a percentage of revenue was 75.6% in 2017 compared to 75.2% in 2016. The increase in gross margin was due to the favorable impact of material cost reductions and volume purchasing, as well as manufacturing efficiencies achieved from a higher revenue level as fixed manufacturing costs were spread over a larger revenue base. These decreases were partially offset by higher revenue from a material customer in the consumer electronics industry under a preferred pricing arrangement, and to a lesser extent, an increased level of projects in the logistics industry that require installation services with lower margins.

Operating Expenses**Research, Development, and Engineering Expenses**

Research, development, and engineering (RD&E) expenses in 2017 increased by \$20,936,000, or 27%, from the prior year as detailed in the table below (in thousands).

RD&E expenses in 2016	\$78,269
Personnel-related costs	9,234
Stock-based compensation expense	4,725
Outsourced engineering costs	1,275
Other	5,702
RD&E expenses in 2017	\$99,205

RD&E expenses increased due to higher personnel-related costs resulting primarily from headcount additions, which included engineering talent from six business acquisitions completed since August 2016. The Company also incurred higher spending on outsourced engineering to support new product initiatives. Stock-based compensation expense was higher than the prior year due to a higher valuation of stock options granted early in 2017.

Selling, General, and Administrative Expenses

Selling, general, and administrative (SG&A) expenses in 2017 increased by \$54,618,000, or 33%, from the prior year as detailed in the table below (in thousands).

SG&A expenses in 2016	\$166,110
Personnel-related costs	17,387
Incentive compensation plans	10,513
Stock-based compensation expense	5,752
Travel expenses	5,654
ERP outside services	3,684
Sales demonstration equipment	2,985
Recruiting costs	2,421
Other	6,222
SG&A expenses in 2017	\$220,728

SG&A expenses increased due to higher personnel-related and recruiting costs resulting from headcount additions, principally sales personnel. In addition, higher incentive compensation plan expenses, including sales commission and Company bonus plans, were recorded in 2017 as a result of the additional headcount and higher achievement levels based upon the Company's performance. Travel expenses and sales demonstration equipment costs were also higher in 2017 due to additional sales personnel and the higher business level. Stock-based compensation expense was higher than the prior year due to a higher valuation of stock options granted early in 2017.

In 2017, the Company incurred costs for outside services related to the preliminary project and application development stages for a new Enterprise Resource Planning (ERP) system, which is the management information system that integrates the Company's manufacturing, order fulfillment, and financial activities.

Non-operating Income (Expense)

The Company recorded foreign currency losses of \$1,601,000 in 2017 and foreign currency gains of \$101,000 in 2016. The foreign currency losses in 2017 resulted primarily from the revaluation and settlement of accounts

receivable denominated in U.S. Dollars recorded on the books of the Company's Irish subsidiary, for which the functional currency

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is the Euro. During the period of time that these receivables were outstanding, the U.S. Dollar weakened versus the Euro resulting in foreign currency losses.

Investment income increased by \$2,503,000, or 36%, from the prior year. The increase was due to higher yields, as well as additional funds available for investment on the Company's portfolio of debt securities.

The Company recorded other expense of \$338,000 in 2017 and other income of \$871,000 in 2016. Other income (expense) included a benefit of \$28,000 in 2017 and a benefit of \$463,000 in 2016 resulting from the revaluation of contingent consideration liabilities arising from business acquisitions. In addition, the Company received a foreign government subsidy in the amount of \$422,000 that was recorded in other income in 2016. Other income (expense) also included rental income, net of associated expenses, from leasing space in buildings adjacent to the Company's corporate headquarters. Fewer tenants occupied this space in 2017, resulting in lower non-operating rental income.

Income Tax Expense

The Company's effective tax rate was 34% of the Company's pre-tax income in 2017 compared to 11% in 2016. On December 22, 2017, the United States Congress passed and the President signed into law the Tax Cuts and Jobs Act of 2017 (the "Tax Act"). The Tax Act includes a number of changes that impact the Company's deferred tax positions, with the primary impact resulting from a decrease in the U.S. federal statutory corporate tax rate from 35% to 21%. The Company remeasured its deferred tax positions as of December 31, 2017 at the new enacted tax rate, and accordingly, recorded tax expense of \$12,523,000 from the write-down of deferred tax assets in 2017.

In addition, the Tax Act subjects unrepatriated foreign earnings to a one-time transition tax, regardless of the Company's financial statement assertion related to indefinite reinvestment or whether the Company ultimately repatriates any of the foreign earnings, for which the Company recorded estimated tax expense of \$101,379,000 in 2017.

Furthermore, the Tax Act replaces the current system of taxing U.S. corporations on repatriated foreign earnings with a partial territorial system that provides a 100% dividends-received deduction to domestic corporations for foreign-source dividends received from 10% or more owned foreign corporations. The Company recorded a decrease in tax expense of \$3,843,000 in 2017 from the reversal of the tax effect of a 2016 dividend paid in 2017 from a wholly-owned foreign subsidiary to its domestic entity.

In addition to the 2017 impact of the Tax Act, the effective tax rate included a decrease in tax expense of \$38,569,000 in 2017 and \$11,889,000 in 2016 from the excess tax benefit arising from the difference between the deduction for tax purposes and the compensation cost recognized for financial reporting purposes from stock option exercises. The Company cannot predict the level of stock option exercises by employees in future periods.

Remaining discrete tax events resulted in a decrease in tax expense of \$2,502,000 in 2017, consisting primarily of the final true-up of the prior year's tax accrual upon filing the actual tax returns and the expiration of the statutes of limitations for certain reserves for income tax uncertainties, and an increase in tax expense of \$475,000 in 2016.

LIQUIDITY AND CAPITAL RESOURCES

The Company has historically been able to generate positive cash flow from operations, which has funded its operating activities and other cash requirements and has resulted in an accumulated cash and investment balance of \$797,599,000 as of December 31, 2018. The Company has established guidelines relative to credit ratings, diversification, and maturities of its investments that maintain liquidity.

The Company's cash requirements in 2018 were primarily met with positive cash flows from operations. Cash requirements consisted of operating activities, the repurchase of common stock, the payment of dividends, and capital expenditures. Capital expenditures in 2018 totaled \$37,095,000 and consisted primarily of computer hardware and software, manufacturing test equipment related to new product introductions, and improvements made to the Company's headquarters building in Natick, Massachusetts. In the third quarter of 2018, the Company placed into service a new Enterprise Resource Planning (ERP) system totaling \$10,000,000 that is being depreciated over a ten year estimate useful life.

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The following table summarizes the Company's material contractual obligations, both fixed and contingent (in thousands):

Year Ended December 31,	Inventory Purchase Commitments	Leases	Total
2019	\$ 11,097	\$7,086	\$18,183
2020	—	5,227	5,227
2021	—	4,109	4,109
2022	—	2,918	2,918
2023	—	2,209	2,209
Thereafter	—	1,198	1,198
	\$ 11,097	\$22,747	\$33,844

In addition to the obligations described above, the following items may also result in future material uses of cash:

Stock Repurchases

In April 2017, the Company's Board of Directors authorized the repurchase of \$100,000,000 of the Company's common stock. The Company repurchased 1,744,000 shares at a cost of \$100,000,000 under this program, including 803,000 shares at a cost of \$45,200,000 in the first quarter of 2018. In February 2018, the Company's Board of Directors authorized the repurchase of \$150,000,000 of the Company's common stock. The Company repurchased 3,174,000 shares at a cost of \$150,000,000 under this program. In October 2018, the Company's Board of Directors authorized the repurchase of \$200,000,000 of the Company's common stock. As of December 31, 2018, the Company repurchased 203,000 shares at a cost of \$8,622,000 under this program, leaving a remaining balance of \$191,378,000. Total stock repurchases in 2018 amounted to \$203,822,000. The Company may repurchase shares under this program in future periods depending on a variety of factors, including, among other things, the impact of dilution from employee stock options, stock price, share availability, and cash requirements.

Dividends

The Company's Board of Directors declared and paid cash dividends of \$0.045 per share in the first, second, and third quarters of 2018. The dividend was increased to \$0.050 in the fourth quarter of 2018. Total dividends in 2018 amounted to \$31,865,000. Future dividends will be declared at the discretion of the Company's Board of Directors and will depend upon such factors as the Board deems relevant, including, among other things, the Company's ability to generate positive cash flow from operations.

Acquisitions

The Company's business strategy includes selective expansion into new machine vision markets and applications through the acquisition of businesses and technologies. Certain of the Company's business acquisitions have contractual obligations for deferred cash payments, contingent cash payments tied to performance, and special incentive cash payments tied to employment, none of which are material individually or in the aggregate to the Company's cash flows.

The Company believes that its existing cash and investment balances, together with cash flow from operations, will be sufficient to meet its operating, investing, and financing activities for the next twelve months. As of December 31, 2018, the Company had \$797,599,000 in cash and investments. In addition, Cognex has no long-term debt and does not anticipate needing debt financing in the near future. We believe that our strong cash position has put us in a relatively good position with respect to our longer-term liquidity needs.

OFF-BALANCE SHEET ARRANGEMENTS

As of December 31, 2018, the Company has no off-balance sheet arrangements as defined in Item 303(a)(4)(ii) of Regulation S-K.

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CRITICAL ACCOUNTING POLICIES AND ESTIMATES

Our discussion and analysis of the Company's financial condition and results of operations are based upon the consolidated financial statements included in this Annual Report on Form 10-K, which have been prepared in accordance with accounting principles generally accepted in the United States. The preparation of these financial statements requires management to make estimates and judgments that affect the reported amounts of assets, liabilities, revenue, and expenses, and related disclosure of contingent assets and liabilities. We base our estimates on historical experience and various other assumptions believed to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results could differ from these estimates under different assumptions or circumstances resulting in charges that could be material in future reporting periods. We believe the following critical accounting policies require the use of significant estimates and judgments in the preparation of our consolidated financial statements.

Revenue Recognition

The Company recognizes revenue in accordance with Accounting Standards Codification (ASC) 606, "Revenue from Contracts with Customers." The core principle of ASC 606 is to recognize revenue in a manner that depicts the transfer of promised goods or services to customers in an amount that reflects the consideration to which the Company expects to be entitled in exchange for those goods or services. The framework in support of this core principle includes: (1) identifying the contract with the customer; (2) identifying the performance obligations in the contract; (3) determining the transaction price; (4) allocating the transaction price to the performance obligations; and (5) recognizing revenue when (or as) the performance obligations are satisfied.

Identifying the Contract with the Customer

The Company identifies contracts with customers as agreements that create enforceable rights and obligations, which typically take the form of customer contracts or purchase orders.

Identifying the Performance Obligations in the Contract

The Company identifies performance obligations as promises in contracts to transfer distinct goods or services. Standard products and services that the Company regularly sells separately are accounted for as distinct performance obligations. Application-specific customer solutions that are comprised of a combination of products and services are accounted for as one performance obligation to deliver a total solution to the customer. On-site support services that are provided to the customer after the solution is deployed are accounted for as a separate performance obligation. These solutions are provided to customers in a variety of industries, including the consumer electronics, logistics, and automotive industries.

Shipping and handling activities for which the Company is responsible under the terms and conditions of the sale are not accounted for as performance obligations but as fulfillment costs. These activities are required to fulfill the Company's promise to transfer the goods and are expensed when revenue is recognized.

The Company does not assess whether promised goods or services are performance obligations if they are immaterial in the context of the contract. If revenue is recognized before immaterial promises have been completed, then the costs related to such immaterial promises are accrued at the time of sale.

Determining the Transaction Price

The Company determines the transaction price as the amount of consideration it expects to receive in exchange for transferring promised goods or services to the customer. Amounts collected from customers for sales taxes are excluded from the transaction price.

If a contract includes a variable amount, such as a rebate, then the Company estimates the transaction price using either the expected value or the most likely amount of consideration to be received, depending upon the specific facts and circumstances. The Company includes estimated variable consideration in the transaction price only to the extent it is probable that a significant reversal of revenue will not occur when the uncertainty is resolved. The Company updates its estimate of variable consideration at the end of each reporting period to reflect changes in facts and circumstances.

Allocating the Transaction Price to the Performance Obligations

The Company allocates the transaction price to each performance obligation at contract inception based on a relative stand-alone selling price basis, or the price at which the Company would sell the good or service separately to similar customers in similar circumstances.

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Recognizing Revenue When (or As) the Performance Obligations are Satisfied

The Company recognizes revenue when it transfers the promised goods or services to the customer. Revenue for standard products is recognized at the point in time when the customer obtains control of the goods, which is typically upon delivery when the customer has legal title, physical possession, the risks and rewards of ownership, and an enforceable obligation to pay for the products. Revenue for services, which are not material, is typically recognized over the time the service is provided.

Revenue for application-specific customer solutions is recognized at the point in time when the solution is validated, which is the point in time when the Company can objectively determine that the agreed-upon specifications in the contract have been met and the customer will accept the performance obligations in the arrangement. Although the customer may have taken legal title and physical possession of the goods when they arrived at the customer's designated site, the significant risks and rewards of ownership transfer to the customer only upon validation. Revenue for on-site support services related to these solutions is recognized over the time the service is provided.

In certain instances, an arrangement may include customer-specified acceptance provisions or performance guarantees that allow the customer to accept or reject delivered products that do not meet the customer's specifications. If the Company can objectively determine that control of a good or service has been transferred to the customer in accordance with the agreed-upon specifications in the contract, then customer acceptance is a formality. If acceptance provisions are presumed to be substantive, then revenue is deferred until customer acceptance.

For the Company's standard products and services, revenue recognition and billing typically occur at the same time. For application-specific customer solutions, however, the agreement with the customer may provide for billing terms which differ from revenue recognition criteria, resulting in either deferred revenue or unbilled revenue. Credit assessments are performed to determine payment terms, which vary by region, industry, and customer. Prepayment terms result in contract liabilities for customer deposits. When credit is granted to customers, payment is typically due 30 to 90 days from billing. The Company's contracts have an original expected duration of less than one year, and therefore as a practical expedient, the Company has elected to ignore the impact of the time value of money on a contract and to expense sales commissions. The Company recognizes an asset for costs to fulfill a contract if the costs relate directly to the contract and to future performance, and the costs are expected to be recovered.

Management exercises judgment when determining the amount of revenue to be recognized each period. Such judgments include, but are not limited to, assessing the customer's ability and intention to pay substantially all of the contract consideration when due, determining when two or more contracts should be combined and accounted for as a single contract, determining whether a contract modification has occurred, assessing whether promises are immaterial in the context of the contract, determining whether material promises in a contract represent distinct performance obligations, estimating the transaction price for a contract that contains variable consideration, determining the stand-alone selling price of each performance obligation, determining whether control is transferred over time or at a point in time for performance obligations, and assessing whether formal customer acceptance provisions are substantive.

Investments

As of December 31, 2018, the Company's investment portfolio of debt securities totaled \$689,387,000. The debt securities are reported at fair value, with unrealized gains and losses, net of tax, recorded in shareholders' equity as other comprehensive income (loss) since these securities are designated as available-for-sale securities. As of December 31, 2018, the Company's portfolio of debt securities had a net unrealized loss of \$1,932,000. Included in this net loss were gross unrealized losses totaling \$2,255,000, of which \$1,445,000 were in a loss position for less than twelve months and \$810,000 were in a loss position for greater than twelve months.

The Company applies a three-level valuation hierarchy for fair value measurements. The categorization of assets and liabilities within the valuation hierarchy is based upon the lowest level of input that is significant to the measurement of fair value. Level 1 inputs to the valuation methodology utilize unadjusted quoted market prices in active markets for identical assets and liabilities. Level 2 inputs to the valuation methodology are other observable inputs, including quoted market prices for similar assets and liabilities, quoted prices for identical and similar assets and liabilities in markets that are not active, or other inputs that are observable or can be corroborated by observable market data. Level 3 inputs to the valuation methodology are unobservable inputs based upon management's best estimate of the inputs

that market participants would use in pricing the asset or liability at the measurement date, including assumptions about risk. Changes in the valuation methodology, interest rates, credit rates, or the market for these investments could result in changes to their fair values. Changes to the Level of an investment within the fair value hierarchy are determined at the end of the reporting period.

The Company's debt securities are reported at fair value based upon model-driven valuations in which all significant inputs are observable or can be derived from or corroborated by observable market data for substantially the full term

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of the asset, and are therefore classified as Level 2. Management is responsible for estimating the fair value of these financial assets and liabilities, and in doing so, considers valuations provided by a large, third-party pricing service. This service maintains regular contact with market makers, brokers, dealers, and analysts to gather information on market movement, direction, trends, and other specific data. They use this information to structure yield curves for various types of debt securities and arrive at the daily valuations.

Management monitors the carrying value of its debt securities compared to their fair value to determine whether an other-than-temporary impairment has occurred. In considering whether a decline in fair value is other-than-temporary, we consider many factors, both qualitative and quantitative in nature, including the type of security, the credit rating of the security, the length of time the security has been in a loss position, the size of the loss position, our ability and intent to hold the security to expected recovery of value, and other meaningful information. If a decline in fair value is determined to be other-than-temporary, an impairment charge would be recorded in current operations to reduce the carrying value of the investment to its fair value. There were no other-than-temporary impairments of investments in 2018, 2017, or 2016.

Accounts Receivable

The Company maintains reserves against its accounts receivable for potential credit losses. Ongoing credit evaluations of customers are performed and the Company has historically not experienced significant losses related to the collection of its accounts receivable. Allowances for specific accounts determined to be at risk for collection are estimated by management taking into account the length of time the receivable has been outstanding, the customer's current ability to pay its obligations to the Company, general economic and industry conditions, as well as various other factors. Global economic uncertainty may result in longer payment cycles and challenges in collecting accounts receivable balances, which make these estimates more judgmental. An adverse change in any of these factors could result in higher than expected customer defaults and may result in the need for additional bad debt provisions. As of December 31, 2018, the Company's reserve against accounts receivable was \$1,646,000, or 1% of the gross accounts receivable balance. A 10% difference in the reserve against accounts receivable as of December 31, 2018 would have affected net income by approximately \$141,000.

Inventories

Inventories are stated at the lower of cost and net realizable value. Net realizable value is the estimated selling price in the ordinary course of business, less readily predictable costs of completion, disposal, and transportation. Management estimates excess and obsolescence exposures based upon assumptions about future demand, product transitions, and market conditions, and records reserves to reduce the carrying value of inventories to their net realizable value. Volatility in the global economy makes these assumptions about future demand more judgmental. Among the risks associated with the introduction of new products are difficulty predicting customer demand and effectively managing inventory levels to ensure adequate supply of the new product and avoid excess supply of the legacy product. In addition, we may strategically enter into non-cancelable commitments with vendors to purchase materials for products in advance of demand to take advantage of favorable pricing or address concerns about the availability of future supplies and long lead times. As of December 31, 2018, the Company's reserve for excess and obsolete inventory totaled \$4,684,000, or 5% of the gross inventory balance. A 10% difference in inventory reserves as of December 31, 2018 would have affected net income by approximately \$402,000.

Long-lived Assets

The Company has long-lived assets, including property, plant, and equipment and acquired intangible assets. These assets are susceptible to shortened estimated useful lives and changes in fair value due to changes in their use, market or economic changes, or other events or circumstances. The Company evaluates the potential impairment of these long-lived assets whenever events or circumstances indicate their carrying value may not be recoverable. Factors that could trigger an impairment review include historical or projected results that are less than the assumptions used in the original valuation of an acquired asset, a change in the Company's business strategy or its use of an acquired asset, or negative economic or industry trends.

If an event or circumstance indicates the carrying value of long-lived assets may not be recoverable, the Company assesses the recoverability of the assets by comparing the carrying value of the assets to the sum of the undiscounted future cash flows that the assets are expected to generate over their remaining economic lives. If the carrying value

exceeds the sum of the undiscounted future cash flows, the Company compares the fair value of the long-lived assets to the carrying value and records an impairment loss for the difference. The Company generally estimates the fair value of its long-lived assets using the income approach based upon a discounted cash flow model. The income approach requires the use of many assumptions and estimates including future revenues and expenses, discount factors, income tax rates, the identification of groups of assets with highly independent cash flows, and assets' economic lives. Volatility in the global economy makes these assumptions and estimates more judgmental. In 2017, the Company determined that the carrying value of the customer relationship

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s arising from the AQSense acquisition was impaired and reduced this value to zero, resulting in an impairment charge of \$469,000. The Company did not record an impairment charge related to long-lived assets in 2018 or 2016. Actual future operating results and the remaining economic lives of our long-lived assets could differ from those used in assessing the recoverability of these assets and could result in an impairment of long-lived assets in future periods.

Internal-use Software

The accounting treatment for computer software developed for internal use depends upon the nature of activities performed at each stage of development. The preliminary project stage includes conceptual formulation of design alternatives, determination of system requirements, vendor demonstrations, and final selection of vendors, and during this stage costs are expensed as incurred. The application development stage includes software configuration, coding, hardware installation, and testing. During this stage, certain costs are capitalized, including external direct costs of materials and services, as well as payroll and payroll-related costs for employees who are directly associated with the project, while certain costs are expensed as incurred, including training and data conversion costs. The post-implementation stage includes support and maintenance, and during this stage costs are expensed as incurred. Capitalization begins when both the preliminary project stage is completed and management commits to funding the project. Capitalization ceases at the point the project is substantially complete and ready for its intended use, that is, after all substantial testing is completed. The application of these rules requires the use of judgment to determine when the project has reached the next stage of development, which costs are directly associated with the project, and when the asset is ready for its intended use.

Goodwill

Management evaluates the potential impairment of goodwill annually each fourth quarter and whenever events or circumstances indicate the carrying value may not be recoverable. Impairment of goodwill is the condition that exists when the carrying amount of a reporting unit exceeds its fair value. The Company currently operates under one reporting unit which is the level at which the goodwill impairment analysis is performed. Determining the Company's reporting units requires judgments regarding what constitutes a business and at what level discrete financial information is available and reviewed by management.

The Company performs a qualitative assessment of goodwill to determine whether further impairment testing is necessary. If this qualitative assessment indicates that it is more likely than not that the fair value of a reporting unit is less than its carrying amount, the entity would proceed to perform a quantitative impairment test. Under this quantitative analysis, the Company compares the fair value of the reporting unit with its carrying value, including goodwill. If the carrying amount exceeds the fair value of the reporting unit, the Company recognizes an impairment charge. The Company estimates the fair value of its reporting unit using the income approach based upon a discounted cash flow model. In addition, the Company uses the market approach, which compares the reporting unit to publicly-traded companies and transactions involving similar businesses, to support the conclusions based upon the income approach. The income approach requires the use of many assumptions and estimates including future revenues, expenses, capital expenditures, and working capital, as well as discount factors and income tax rates. Factors that management considered in the qualitative assessment include macroeconomic conditions, industry and market considerations, overall financial performance (both current and projected), changes in management or strategy, changes in the composition or carrying amount of net assets, and market capitalization. Based on the qualitative assessment, management does not believe that it is more likely than not that the carrying value of its reporting unit exceeds its fair value. No impairment losses were recorded in 2018, 2017, or 2016.

Warranty Obligations

The Company records the estimated cost of fulfilling product warranties at the time of sale based upon historical costs to fulfill claims. Obligations may also be recorded subsequent to the time of sale whenever specific events or circumstances impacting product quality become known that would not have been taken into account using historical data. While we engage in extensive product quality programs and processes, including actively monitoring and evaluating the quality of our component suppliers and third-party contract manufacturers, the Company's warranty obligation is affected by product failure rates, material usage, and service delivery costs incurred in correcting a product failure. An adverse change in any of these factors may result in the need for additional warranty provisions. As of December 31, 2018, the Company's accrued warranty obligations amounted to \$4,743,000. A 10% difference in

accrued warranty obligations as of December 31, 2018 would have affected net income by approximately \$407,000.

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Contingencies

Estimated losses from contingencies are accrued by management based upon whether a loss is probable and whether management has the ability to reasonably estimate the amount of the loss. Estimating potential losses, or even a range of losses, is difficult and involves a great deal of judgment. Management relies primarily on assessments made by its internal and external legal counsel to make the determination as to whether a loss contingency arising from litigation should be recorded or disclosed. This analysis is performed each reporting period or when facts and circumstances dictate. Should the resolution of a contingency result in a loss that we did not accrue because management did not believe that the loss was probable or capable of being reasonably estimated, then this loss would result in a charge to income in the period the contingency was resolved. The Company did not have any significant accrued contingencies as of December 31, 2018.

Derivative Instruments

In certain instances, the Company enters into forward contracts to hedge against foreign currency fluctuations. The Company's forward contracts are reported at fair value based upon model-driven valuations in which all significant inputs are observable or can be derived from or corroborated by observable market data for substantially the full term of the asset or liability, and are therefore classified as Level 2. The Company's forward contracts are typically traded or executed in over-the-counter markets with a relatively high degree of pricing transparency. The market participants are generally large commercial banks.

The Company enters into two types of hedges to manage foreign currency exchange rate risk. The first are economic hedges which utilize foreign currency forward contracts to manage the exposure to fluctuations in foreign currency exchange rates arising primarily from foreign-denominated receivables and payables. The gains and losses on these derivatives are intended to be offset by the changes in the fair value of the assets and liabilities being hedged. These economic hedges are not designated as effective hedges, and therefore, do not qualify for effective hedge accounting. The second are cash flow hedges which utilize foreign currency forward contracts to protect our budgeted revenues and expenses against foreign currency exchange rate changes compared to our budgeted rates. These cash flow hedges are designated for hedge accounting, and therefore, the effective portion of the forward contract's gain or loss is reported in shareholders' equity as other comprehensive income (loss) and is reclassified into current operations as the hedged transaction impacts current operations. Should these hedges fail to qualify for hedge accounting or be ineffective, the gain or loss on the forward contract would be reported in current operations immediately as opposed to when the hedged transaction impacts current operations. This may result in material foreign currency gains or losses.

Stock-Based Compensation

Compensation expense is recognized for all stock option and restricted stock grants. Determining the appropriate valuation model and estimating the fair values of these grants requires the input of subjective assumptions, including expected stock price volatility, dividend yields, expected term, and forfeiture rates. The expected volatility assumption is based partially upon the historical volatility of the Company's common stock, which may or may not be a true indicator of future volatility, particularly as the Company continues to seek to diversify its customer base. The assumptions used in calculating the fair values of stock option grants represent management's best estimates, but these estimates involve inherent uncertainties and the application of judgment. As a result, if factors change and different assumptions are used, stock-based compensation expense could be significantly different from what the Company recorded in the current period.

Income Taxes

Significant judgment is required in determining worldwide income tax expense based upon tax laws in the various jurisdictions in which the Company operates. The Company has established reserves for income taxes by applying the "more likely than not" criteria, under which the recognition threshold is met when an entity concludes that a tax position, based solely on its technical merits, is more likely than not to be sustained upon examination by the relevant tax authority. All tax positions are analyzed periodically and adjustments are made as events occur that warrant modification, such as the completion of audits or the expiration of statutes of limitations, which may result in future charges or credits to income tax expense.

As part of the process of preparing consolidated financial statements, management is required to estimate income taxes in each of the jurisdictions in which the Company operates. This process involves estimating the current tax

liability, as well as assessing temporary differences arising from the different treatment of items for financial statement and tax purposes. These differences result in deferred tax assets and liabilities, which are recorded on the Consolidated Balance Sheets.

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On December 22, 2017, the Tax Cuts and Jobs Act of 2017 (Tax Act) was signed into law. The Tax Act resulted in a decrease in the U.S. federal statutory corporate tax rate from 35% to 21%. As a result of the reduction in anticipated tax rate, the Company remeasured its deferred tax positions as of December 31, 2017 at the new enacted tax rate, and accordingly, recorded tax expense of \$12,523,000 in 2017 from the associated write-down of its deferred tax assets. In 2018, the Company recorded an increase in tax expense of \$3,240,000 from the write-down of its deferred tax assets primarily relating to guidance under the Tax Act regarding stock-based compensation.

The Tax Act subjects unrepatriated foreign earnings to a one-time transition tax, regardless of the Company's financial statement assertion related to indefinite reinvestment or whether the Company ultimately repatriates any of the foreign earnings, for which the Company recorded estimated tax expense of \$101,379,000 in 2017. In 2018, the Company revised its estimate of the one-time transition tax and recorded a decrease in tax expense of \$11,028,000, which resulted in revised estimate for the one-time transition tax of \$90,351,000 payable over eight years.

The Company will continue to gather and analyze information on historical unrepatriated foreign earnings and monitor state laws relating to this income to finalize both the federal and state tax impact. The Tax Act limits certain deductions and these limitations may impact the value of existing deferred tax assets. The Company will continue to review the impact of these limitations as regulatory guidance is issued.

Business Combinations

Business combinations are accounted for under the acquisition method of accounting. Determining what constitutes a business to qualify as a business combination requires some judgment. Allocating the purchase price requires the Company to identify and estimate the fair values of various assets acquired and liabilities assumed. Management is responsible for determining the appropriate valuation model and estimated fair values, and in doing so, considers a number of factors, including information provided by an outside valuation advisor. Management primarily establishes fair value using the income approach based upon a discounted cash flow model. The income approach requires the use of many assumptions and estimates including future revenues and expenses, as well as discount factors. Contingent consideration liabilities are reported at their estimated fair values based upon probability-adjusted present values of the consideration expected to be paid, using significant inputs and estimates. Key assumptions used in these estimates include probability assessments with respect to the likelihood of achieving certain milestones and discount rates consistent with the level of risk of achievement. The fair value of these contingent consideration liabilities are remeasured each reporting period, with changes in the fair value recorded in "Other income (expense)" on the Consolidated Statement of Operations. The remeasured liability amount could be significantly different from the amount at the acquisition date, resulting in material charges or credits in future reporting periods.

NEW PRONOUNCEMENTS

Refer to Part II, Item 8 - Note 2 within this Form 10-K, for a full description of recently issued accounting pronouncements including the expected dates of adoption and expected impact on the financial position and results of operations of the Company.

ITEM 7A: QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

The Company is exposed to certain risks relating to its ongoing business operations, including foreign currency exchange rate risk and interest rate risk. The Company currently mitigates certain foreign currency exchange rate risks with derivative instruments. The Company does not currently manage its interest rate risk with derivative instruments.

Foreign Currency Risk

The Company faces exposure to foreign currency exchange rate fluctuations, as a significant portion of its revenues, expenses, assets, and liabilities are denominated in currencies other than the functional currencies of the Company's subsidiaries or the reporting currency of the Company, which is the U.S. Dollar. In certain instances, we utilize forward contracts to hedge against foreign currency fluctuations. These contracts are used to minimize foreign gains or losses, as the gains or losses on the derivative are intended to offset the losses or gains on the underlying exposure. We do not engage in foreign currency speculation.

The Company's foreign currency risk management strategy is principally designed to mitigate the potential financial impact of changes in the value of transactions and balances denominated in foreign currencies resulting from changes in foreign currency exchange rates. The Company enters into two types of hedges to manage this risk. The first are economic hedges which utilize foreign currency forward contracts with maturities of up to 45 days to manage the

exposure to fluctuations in foreign currency exchange rates arising primarily from foreign-denominated receivables and payables. The gains and losses on these derivatives are intended to be offset by the changes in the fair value of the assets and liabilities being hedged. The second are cash flow hedges which utilize foreign currency forward

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contracts with maturities of up to 18 months to hedge specific forecasted transactions of the Company's foreign subsidiaries with the goal of protecting our budgeted revenues and expenses against foreign currency exchange rate changes compared to our budgeted rates. The Company did not have any cash flow hedges as of December 31, 2018 and 2017.

The Company had the following outstanding forward contracts (in thousands):

Currency	December 31, 2018				December 31, 2017			
	Notional Value	USD Equivalent	High Rate	Low Rate	Notional Value	USD Equivalent	High Rate	Low Rate
Derivatives Not Designated as Hedging Instruments:								
Euro	23,000	\$ 26,330	0.8735	0.8735	—	\$ —	—	—
Japanese Yen	380,000	3,459	109.86	109.86	455,000	4,049	134.88	134.88
British Pound	2,500	3,204	0.7803	0.7803	1,650	2,232	0.8874	0.8874
Korean Won	3,125,000	2,808	1,113	1,113	1,825,000	1,708	1,282	1,282
Hungarian Forint	750,000	2,685	279.3	279.3	545,000	2,110	309.95	309.95
Taiwanese Dollar	55,000	1,807	30.43	30.43	37,725	1,278	35.43	35.43
Canadian Dollar	990	726	1.3639	1.3639	—	—	—	—
Singapore Dollar	700	514	1.3628	1.3628	—	—	—	—
Swiss Franc	—	—	—	—	1,365	1,401	0.9740	0.9740

A change in foreign currency exchange rates could materially impact the fair value of these contracts; however, if this occurred, the fair value of the underlying exposures hedged by the contracts would change by a similar amount.

Accordingly, management does not believe that a material change in foreign currency exchange rates used in the fair value of our derivative instruments would materially impact operations or cash flows.

The success of our foreign currency risk management program depends upon forecasts of transaction activity denominated in various currencies. To the extent that these forecasts are overstated or understated during periods of currency volatility, we could experience unanticipated foreign currency gains or losses that could have a material impact on our results of operations. Furthermore, our failure to identify new exposures and hedge them in an effective manner may result in material foreign currency gains or losses.

The Company's functional currency/reporting currency exchange rate exposures result from revenues and expenses that are denominated in currencies other than the U.S. Dollar. A significant portion of our revenues and expenses are denominated in the Euro, the Japanese Yen, and the Chinese Yuan, also known as Renminbi. Our predominant currency of sale is the U.S. Dollar in the Americas, the Euro and U.S. Dollar in Europe, the Yuan in Mainland China, the Yen in Japan, and the U.S. Dollar in other regions. We estimate that approximately 43% of our sales in 2018 were invoiced in currencies other than the U.S. Dollar, and we expect sales denominated in foreign currencies to continue to represent a significant portion of our total revenue. While we also have expenses denominated in these same foreign currencies, the impact on revenues has historically been, and is expected to continue to be, greater than the offsetting impact on expenses. Therefore, in times when the U.S. Dollar strengthens in relation to these foreign currencies, we would expect to report a net decrease in operating income. Conversely, in times when the U.S. Dollar weakens in relation to these foreign currencies, we would expect to report a net increase in operating income. Thus, changes in the relative strength of the U.S. Dollar may have a material impact on our operating results.

Interest Rate Risk

The Company's investment portfolio of debt securities includes corporate bonds, treasury bills, asset-backed securities, sovereign bonds, agency bonds, and municipal bonds. Debt securities with original maturities greater than three months are designated as available-for-sale and are reported at fair value. As of December 31, 2018, the fair value of the Company's portfolio of debt securities amounted to \$689,387,000 with amortized cost amounts totaling \$691,319,000, maturities that do not exceed seven years, and a yield to maturity of 2.61%. Differences between the fair value and principal amounts of the Company's portfolio of debt securities are primarily attributable to discounts and premiums arising at the acquisition date, as well as unrealized gains and losses as of the balance sheet date.

The Company's investment policy allows investment in debt securities with effective maturities up to ten years, however as of December 31, 2018, 93% of the investment portfolio has effective maturity dates of less than three years. Given the relatively short maturities and investment-grade quality of the Company's portfolio of debt securities as of

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December 31, 2018, a sharp rise in interest rates should not have a material adverse effect on the fair value of these instruments. As a result, the Company does not currently hedge these interest rate exposures.

The following table presents the hypothetical change in the fair value of the Company's portfolio of debt securities arising from selected potential changes in interest rates (in thousands). This modeling technique measures the change in fair value that would result from a parallel shift in the yield curve plus or minus 50 and 100 basis points (BP) over a twelve-month time horizon.

Type of security	Valuation of securities given an interest rate decrease		No change in interest rates	Valuation of securities given an interest rate increase	
	(100 BP)	(50 BP)		50 BP	100 BP
Corporate bonds	\$ 301,884	\$ 301,161	\$ 300,437	\$ 299,714	\$ 298,991
Treasury bills	232,348	231,792	231,237	230,682	230,127
Asset-backed securities	132,673	132,355	132,038	131,720	131,401
Sovereign bonds	14,487	14,452	14,417	14,383	14,348
Agency bonds	5,949	5,935	5,921	5,906	5,892
Municipal bonds	5,363	5,350	5,337	5,324	5,311
	\$ 692,704	\$ 691,045	\$ 689,387	\$ 687,729	\$ 686,070

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ITEM 8: FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

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REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

Board of Directors and Shareholders
Cognex Corporation

Opinion on the financial statements

We have audited the accompanying consolidated balance sheets of Cognex Corporation (a Massachusetts corporation) and subsidiaries (the “Company”) as of December 31, 2018 and 2017, the related consolidated statements of comprehensive income, changes in shareholders’ equity, and cash flows for each of the three years in the period ended December 31, 2018, and the related notes and financial statement schedule included under Item 15(2) (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 14, 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 2007.

Boston, Massachusetts
February 14, 2019

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COGNEX CORPORATION – CONSOLIDATED STATEMENTS OF OPERATIONS

	Year Ended December 31,		
	2018	2017	2016
	(In thousands, except per share amounts)		
Revenue	\$806,338	\$766,083	\$529,515
Cost of revenue	206,052	187,289	131,070
Gross margin	600,286	578,794	398,445
Research, development, and engineering expenses	116,445	99,205	78,269
Selling, general, and administrative expenses	262,699	220,728	166,110
Operating income	221,142	258,861	154,066
Foreign currency gain (loss)	(1,064)	(1,601)	101
Investment income	14,715	9,542	7,039
Other income (expense)	(219)	(338)	871
Income from continuing operations before income tax expense	234,574	266,464	162,077
Income tax expense on continuing operations	15,307	89,752	18,128
Net income from continuing operations	219,267	176,712	143,949
Net income (loss) from discontinued operations (Note 20)	—	—	(255)
Net income	\$219,267	\$176,712	\$143,694
Basic earnings per weighted-average common and common-equivalent share (1):			
Net income from continuing operations	\$1.27	\$1.02	\$0.84
Net income (loss) from discontinued operations	\$—	\$—	\$—
Net income	\$1.27	\$1.02	\$0.84
Diluted earnings per weighted-average common and common-equivalent share (1):			
Net income from continuing operations	\$1.24	\$0.98	\$0.83
Net income (loss) from discontinued operations	\$—	\$—	\$—
Net income	\$1.24	\$0.98	\$0.83
Weighted-average common and common-equivalent shares outstanding (1):			
Basic	172,333	173,287	170,676
Diluted	177,406	179,551	174,144
Cash dividends per common share (1)	\$0.1850	\$0.1675	\$0.1475

(1) Prior period results have been adjusted to reflect the two-for-one stock split effected in the form of a stock dividend which occurred in the fourth quarter of 2017.

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

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COGNEX CORPORATION – CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME

	Year Ended December 31,		
	2018	2017	2016
	(In thousands)		
Net income	\$219,267	\$176,712	\$143,694
Other comprehensive income (loss), net of tax:			
Cash flow hedges:			
Net unrealized gain (loss), net of tax of \$0, (\$5), and (\$22) in 2018, 2017, and 2016, respectively	—	4	(567)
Reclassification of net realized (gain) loss into current operations	—	(41)	398
Net change related to cash flow hedges	—	(37)	(169)
Available-for-sale investments:			
Net unrealized gain (loss), net of tax of (\$188), \$2, and \$248 in 2018, 2017, and 2016, respectively	(1,185)	703	1,672
Reclassification of net realized (gain) loss into current operations	(501)	(829)	(191)
Net change related to available-for-sale investments	(1,686)	(126)	1,481
Foreign currency translation adjustments:			
Foreign currency translation adjustments, net of tax of \$0, \$0 and (\$228) in 2018, 2017, and 2016, respectively	(4,216)	21,992	(5,616)
Net change related to foreign currency translation adjustments	(4,216)	21,992	(5,616)
Other comprehensive income gain (loss), net of tax	(5,902)	21,829	(4,304)
Total comprehensive income	\$213,365	\$198,541	\$139,390

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

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COGNEX CORPORATION – CONSOLIDATED BALANCE SHEETS

	December 31,	
	2018	2017
	(In thousands)	
ASSETS		
Current assets:		
Cash and cash equivalents	\$ 108,212	\$ 106,582
Short-term investments	427,348	297,961
Accounts receivable, less reserves of \$1,646 and \$1,568 in 2018 and 2017, respectively	119,172	119,388
Unbilled revenue	8,312	7,454
Inventories	83,282	67,923
Prepaid expenses and other current assets	34,000	30,683
Total current assets	780,326	629,991
Long-term investments	262,039	423,441
Property, plant, and equipment, net	91,396	78,048
Goodwill	113,208	113,208
Intangible assets, net	10,113	13,189
Deferred income taxes	28,660	27,385
Other assets	3,925	2,491
Total assets	\$ 1,289,667	\$ 1,287,753
LIABILITIES AND SHAREHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	\$ 16,230	\$ 23,463
Accrued expenses	60,220	68,249
Accrued income taxes	5,062	11,503
Deferred revenue and customer deposits	9,845	9,420
Total current liabilities	91,357	112,635
Deferred income taxes	962	312
Reserve for income taxes	7,106	6,488
Accrued income taxes	51,113	66,741
Other non-current liabilities	3,866	5,904
Total liabilities	154,404	192,080
Commitments and contingencies (Note 10)		
Shareholders' equity (1):		
Common stock, \$.002 par value – Authorized: 300,000 and 200,000 shares in 2018 and 2017, respectively, issued and outstanding:	342	347
170,820 and 173,507 shares in 2018 and 2017, respectively		
Additional paid-in capital	529,208	461,338
Retained earnings	646,214	668,587
Accumulated other comprehensive loss, net of tax	(40,501)	(34,599)
Total shareholders' equity	1,135,263	1,095,673
	\$ 1,289,667	\$ 1,287,753

(1) Prior period amounts have been adjusted to reflect the two-for-one stock split effected in the form of a stock dividend which occurred in the fourth quarter of 2017.

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

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COGNEX CORPORATION – CONSOLIDATED STATEMENTS OF CASH FLOWS

	Year Ended December 31,		
	2018	2017	2016
	(In thousands)		
Cash flows from operating activities:			
Net income	\$219,267	\$176,712	\$143,694
Adjustments to reconcile net income to net cash provided by operating activities:			
Loss on sale of discontinued business	—	—	255
Stock-based compensation expense	41,090	31,942	20,558
Depreciation of property, plant, and equipment	18,473	13,683	11,678
Amortization of intangible assets	3,076	3,308	3,391
Impairment of intangible assets	—	469	—
Amortization of discounts or premiums on investments	108	205	383
Realized (gain) loss on sale of investments	(501)	(829)	(1,506)
Revaluation of contingent consideration	(3)	(28)	(463)
Change in deferred income taxes	(413)	1,787	(1,908)
Changes in operating assets and liabilities:			
Accounts receivable	(1,867)	(55,185)	(13,251)
Unbilled revenue	(906)	(4,604)	(2,308)
Inventories	(16,946)	(37,088)	10,409
Prepaid expenses and other current assets	(9,750)	(7,016)	(5,421)
Accounts payable	(7,247)	12,322	2,087
Accrued expenses	380	14,476	7,771
Accrued income taxes	(21,903)	71,335	1,270
Deferred revenue and customer deposits	1,434	1,619	3,622
Other	(838)	1,215	1,820
Net cash provided by operating activities	223,454	224,323	182,081
Cash flows from investing activities:			
Purchases of investments	(782,032)	(636,856)	(751,868)
Maturities and sales of investments	812,565	584,464	657,250
Purchases of property, plant, and equipment	(37,095)	(28,754)	(12,816)
Cash paid for acquisition of business, net of cash acquired	(4,265)	(24,118)	(14,285)
Net cash paid from sale of discontinued business	—	(291)	(113)
Net cash used in investing activities	(10,827)	(105,555)	(121,832)
Cash flows from financing activities:			
Issuance of common stock under stock plans	26,783	54,557	43,468
Repurchase of common stock	(203,822)	(123,715)	(47,149)
Payment of dividends	(31,865)	(29,037)	(25,213)
Payment of contingent consideration	(1,000)	(1,926)	(337)
Net cash used in financing activities	(209,904)	(100,121)	(29,231)
Effect of foreign exchange rate changes on cash and cash equivalents	(1,093)	8,294	(3,352)
Net change in cash and cash equivalents	1,630	26,941	27,666
Cash and cash equivalents at beginning of year	106,582	79,641	51,975
Cash and cash equivalents at end of year	\$108,212	\$106,582	\$79,641

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

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COGNEX CORPORATION – CONSOLIDATED STATEMENTS OF SHAREHOLDERS' EQUITY

(In thousands)	Common Stock (1)		Additional Paid-in Capital (1)	Retained Earnings (1)	Accumulated Other Comprehensive Loss	Total Shareholders' Equity
	Shares	Par Value				
Balance as of December 31, 2015	169,712	\$ 340	\$ 310,829	\$ 573,286	\$ (52,124)	\$ 832,331
Issuance of common stock under stock plans	3,954	8	43,460	—	—	43,468
Repurchase of common stock	(1,788)	(4)	—	(47,145)	—	(47,149)
Stock-based compensation expense	—	—	20,558	—	—	20,558
Payment of dividends	—	—	—	(25,213)	—	(25,213)
Net income	—	—	—	143,694	—	143,694
Net unrealized gain (loss) on cash flow hedges, net of tax of (\$22)	—	—	—	—	(567)	(567)
Reclassification of net realized (gain) loss on cash flow hedges	—	—	—	—	398	398
Net unrealized gain (loss) on available-for-sale investments, net of tax of \$248	—	—	—	—	1,672	1,672
Reclassification of net realized (gain) loss on the sale of available-for-sale investments	—	—	—	—	(191)	(191)
Foreign currency translation adjustment, net of tax of (\$228)	—	—	—	—	(5,616)	(5,616)
Balance as of December 31, 2016	171,878	\$ 344	\$ 374,847	\$ 644,622	\$ (56,428)	\$ 963,385
Issuance of common stock under stock plans	4,162	8	54,549	—	—	54,557
Repurchase of common stock	(2,533)	(5)	—	(123,710)	—	(123,715)
Stock-based compensation expense	—	—	31,942	—	—	31,942
Payment of dividends	—	—	—	(29,037)	—	(29,037)
Net income	—	—	—	176,712	—	176,712
Net unrealized gain (loss) on cash flow hedges, net of tax of (\$5)	—	—	—	—	4	4
Reclassification of net realized (gain) loss on cash flow hedges	—	—	—	—	(41)	(41)
Net unrealized gain (loss) on available-for-sale investments, net of tax of \$2	—	—	—	—	703	703
Reclassification of net realized (gain) loss on the sale of available-for-sale investments	—	—	—	—	(829)	(829)
Foreign currency translation adjustment, net of tax of \$0	—	—	—	—	21,992	21,992
Balance as of December 31, 2017	173,507	\$ 347	\$ 461,338	\$ 668,587	\$ (34,599)	\$ 1,095,673
Issuance of common stock under stock plans	1,493	3	26,780	—	—	26,783
Repurchase of common stock	(4,180)	(8)	—	(203,814)	—	(203,822)
Stock-based compensation expense	—	—	41,090	—	—	41,090
Payment of dividends	—	—	—	(31,865)	—	(31,865)
Adjustment as a result of the adoption of ASU 2016-06 "Income Taxes - Intra-Entity Transfers Other than Inventory" (Note 17)	—	—	—	(5,961)	—	(5,961)
Net income	—	—	—	219,267	—	219,267

Net unrealized gain (loss) on available-for-sale investments, net of tax of (\$188)	—	—	—	—	(1,185	) (1,185)
Reclassification of net realized (gain) loss on the sale of available-for-sale investments	—	—	—	—	(501	) (501)
Foreign currency translation adjustment, net of tax of \$0	—	—	—	—	(4,216	) (4,216)
Balance as of December 31, 2018	170,820	\$ 342	\$ 529,208	\$ 646,214	\$ (40,501	) \$ 1,135,263	

(1) Prior period amounts have been adjusted to reflect the two-for-one stock split effected in the form of a stock dividend which occurred in the fourth quarter of 2017.

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

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NOTE 1: Summary of Significant Accounting Policies

The accompanying consolidated financial statements reflect the application of the significant accounting policies described below.

Nature of Operations

Cognex Corporation is a leading provider of machine vision products that capture and analyze visual information in order to automate tasks, primarily in manufacturing processes, where vision is required.

Use of Estimates in the Preparation of Financial Statements

The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America (U.S. GAAP) requires management to make estimates and judgments that affect the reported amounts of assets and liabilities and the disclosure of contingent liabilities as of the balance sheet date, and the reported amounts of revenues and expenses during the year. Actual results could differ from those estimates.

Significant estimates and judgments include those related to revenue recognition, investments, accounts receivable, inventories, long-lived assets, internal-use software, goodwill, warranty obligations, contingencies, derivative instruments, stock-based compensation, income taxes, and business combinations.

Basis of Consolidation

The consolidated financial statements include the accounts of Cognex Corporation and its subsidiaries, all of which are wholly-owned. All intercompany accounts and transactions have been eliminated.

Foreign Currency Translation

The financial statements of the Company's foreign subsidiaries, where the local currency is the functional currency, are translated using exchange rates in effect at the end of the year for assets and liabilities and average exchange rates during the year for results of operations. The resulting foreign currency translation adjustment, net of tax, is recorded in shareholders' equity as other comprehensive income (loss).

Fair Value Measurements

The Company applies a three-level valuation hierarchy for fair value measurements. The categorization of assets and liabilities within the valuation hierarchy is based upon the lowest level of input that is significant to the measurement of fair value. Level 1 inputs to the valuation methodology utilize unadjusted quoted market prices in active markets for identical assets and liabilities. Level 2 inputs to the valuation methodology are other observable inputs, including quoted market prices for similar assets and liabilities, quoted prices for identical and similar assets and liabilities in markets that are not active, or other inputs that are observable or can be corroborated by observable market data. Level 3 inputs to the valuation methodology are unobservable inputs based upon management's best estimate of the inputs that market participants would use in pricing the asset or liability at the measurement date, including assumptions about risk. A change to the level of an asset or liability within the fair value hierarchy is determined at the end of a reporting period.

Cash, Cash Equivalents, and Investments

Money market instruments and debt securities with original maturities of three months or less are classified as cash equivalents and are stated at amortized cost. Debt securities with original maturities greater than three months and remaining maturities of one year or less are classified as short-term investments, as well as equity securities that the Company intends to sell within one year. Debt securities with remaining maturities greater than one year are classified as long-term investments. It is the Company's policy to invest in debt securities with effective maturities that do not exceed ten years.

Debt securities with original maturities greater than three months are designated as available-for-sale and are reported at fair value, with unrealized gains and losses, net of tax, recorded in shareholders' equity as other comprehensive income (loss). Equity securities that are held for short periods of time with the intention of selling them in the near term are designated as trading and are reported at fair value, with unrealized gains and losses recorded in current operations. Realized gains and losses are included in current operations, along with the amortization of the discount or premium on debt securities arising at acquisition, and are calculated using the specific identification method. The

Company's limited partnership interest is accounted for using the cost method because the Company's investment is less than 5% of the partnership and the Company has no influence over the partnership's operating and financial

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policies. The carrying value of this investment has been reduced to zero, and therefore, distributions are recorded as investment income as they occur.

Management monitors the carrying value of its investments in debt securities compared to their fair value to determine whether an other-than-temporary impairment has occurred. If the fair value of a debt security is less than its amortized cost, the Company assesses whether the impairment is other-than-temporary. In considering whether a decline in fair value is other-than-temporary, we consider many factors. In its evaluation of its debt securities, management considers the type of security, the credit rating of the security, the length of time the security has been in a loss position, the size of the loss position, our intent and ability to hold the security to expected recovery of value, and other meaningful information. An impairment is considered other-than-temporary if (i) the Company has the intent to sell the security, (ii) it is more likely than not that the Company will be required to sell the security before recovery of the entire amortized cost basis, or (iii) the Company does not expect to recover the entire amortized cost basis of the security. If impairment is considered other-than-temporary based upon condition (i) or (ii) described above, the entire difference between the amortized cost and the fair value of the security is recognized in current operations. If an impairment is considered other-than-temporary based upon condition (iii), the amount representing credit losses (defined as the difference between the present value of the cash flows expected to be collected and the amortized cost basis of the security) is recognized in current operations and the amount relating to all other factors is recognized in shareholders' equity as other comprehensive income (loss).

Accounts Receivable

The Company extends credit with various payment terms to customers based upon an evaluation of their financial condition. Accounts that are outstanding longer than the payment terms are considered to be past due. The Company establishes reserves against accounts receivable for potential credit losses and records bad debt expense in current operations when it determines receivables are at risk for collection based upon the length of time the receivable has been outstanding, the customer's current ability to pay its obligations to the Company, general economic and industry conditions, as well as various other factors. Receivables are written off against these reserves in the period they are determined to be uncollectible and payments subsequently received on previously written-off receivables are recorded as a reversal of the bad debt expense.

Inventories

Inventories are stated at the lower of cost and net realizable value. Cost is determined using standard costs, which approximates actual costs under the first-in, first-out (FIFO) method. Net realizable value is the estimated selling prices in the ordinary course of business, less reasonably predictable costs of completion, disposal, and transportation. The Company's inventory is subject to technological change or obsolescence. The Company reviews inventory quantities on hand and estimates excess and obsolescence exposures based upon assumptions about future demand, product transitions, and market conditions, and records reserves to reduce the carrying value of inventories to their net realizable value. If actual future demand is less than estimated, additional inventory write-downs would be required. The Company generally disposes of obsolete inventory upon determination of obsolescence. The Company does not dispose of excess inventory immediately, due to the possibility that some of this inventory could be sold to customers as a result of differences between actual and forecasted demand. When inventory has been written down below cost, such reduced amount is considered the new cost basis for subsequent accounting purposes. As a result, the Company would recognize a higher than normal gross margin if the reserved inventory were subsequently sold.

Property, Plant, and Equipment

Property, plant, and equipment are stated at cost and depreciated using the straight-line method over the assets' estimated useful lives. Buildings' useful lives are 39 years, building improvements' useful lives are ten years, and the useful lives of computer hardware and software, manufacturing test equipment, and furniture and fixtures range from two to ten years. Leasehold improvements are depreciated over the shorter of the estimated useful lives or the remaining terms of the leases. Maintenance and repairs are expensed when incurred; additions and improvements are capitalized. Upon retirement or disposition, the cost and related accumulated depreciation of the disposed assets are removed from the accounts, with any resulting gain or loss included in current operations.

Internal-use Software

Internal-use software is software acquired, internally developed, or modified solely to meet the entity's internal needs, and during the software's development, no substantive plan exists to sell the software. The accounting treatment for computer software developed for internal use depends upon the nature of activities performed at each stage of

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development. The preliminary project stage includes conceptual formulation of design alternatives, determination of system requirements, vendor demonstrations, and final selection of vendors, and during this stage costs are expensed as incurred. The application development stage includes software configuration, coding, hardware installation, and testing. During this stage, certain costs are capitalized, including external direct costs of materials and services, as well as payroll and payroll-related costs for employees who are directly associated with the project, while certain costs are expensed as incurred, including training and data conversion costs. The post-implementation stage includes support and maintenance, and during this stage costs are expensed as incurred.

Capitalization begins when both the preliminary project stage is completed and management commits to funding the project. Capitalization ceases at the point the project is substantially complete and ready for its intended use, that is, after all substantial testing is completed. Costs of specified upgrades and enhancements to internal-use software are capitalized if it is probable that those expenditures result in additional functionality. Capitalized costs are amortized on a straight line basis over the estimated useful life.

Goodwill

Goodwill is stated at cost. The Company evaluates the possible impairment of goodwill annually each fourth quarter and whenever events or circumstances indicate the carrying value of the goodwill may not be recoverable. The Company performs a qualitative assessment of goodwill to determine whether further impairment testing is necessary. Factors that management considers in this assessment include macroeconomic conditions, industry and market considerations, overall financial performance (both current and projected), changes in management or strategy, changes in the composition or carrying amount of net assets, and market capitalization. If this qualitative assessment indicates that it is more likely than not that the fair value of a reporting unit is less than its carrying amount, the entity would proceed to perform a quantitative impairment test. Under this quantitative analysis, the fair value of the reporting unit is compared with its carrying value, including goodwill. If the carrying amount exceeds the fair value of the reporting unit, the Company recognizes an impairment charge. The Company estimates the fair value of its reporting unit using the income approach based upon a discounted cash flow model. In addition, the Company uses the market approach, which compares the reporting unit to publicly-traded companies and transactions involving similar businesses, to support the conclusions based upon the income approach.

Intangible Assets

Intangible assets are stated at cost and amortized over the assets' estimated useful lives. Intangible assets are either amortized in relation to the relative cash flows anticipated from the intangible asset or using the straight-line method, depending upon facts and circumstances. The useful lives of distribution networks range from eleven to twelve years, of completed technologies from five to seven years, of customer relationships from five to eight years, and of non-compete agreements three years. The Company evaluates the possible impairment of long-lived assets, including intangible assets, whenever events or circumstances indicate the carrying value of the assets may not be recoverable. At the occurrence of a certain event or change in circumstances, the Company evaluates the potential impairment of an asset by estimating the future undiscounted cash flows expected to result from the use and eventual disposition of the asset. If the sum of the estimated future cash flows is less than the carrying value, the Company determines the amount of such impairment by comparing the fair value of the asset to its carrying value. The fair value is based upon the present value of the estimated future cash flows using a discount rate commensurate with the risks involved.

Warranty Obligations

The Company warrants its products to be free from defects in material and workmanship for periods primarily ranging from one to three years from the time of sale based upon the product being purchased and the terms of the customer arrangement. Warranty obligations are evaluated and recorded at the time of sale since it is probable that customers will make claims under warranties related to products that have been sold and the amount of these claims can be reasonably estimated based upon historical costs to fulfill claims. Obligations may also be recorded subsequent to the time of sale whenever specific events or circumstances impacting product quality become known that would not have been taken into account using historical data.

Contingencies

Loss contingencies are accrued if the loss is probable and the amount of the loss can be reasonably estimated. Legal costs associated with potential loss contingencies, such as patent infringement matters, are expensed as incurred.

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Revenue Recognition

The Company recognizes revenue in accordance with Accounting Standards Codification (ASC) 606, "Revenue from Contracts with Customers." The core principle of ASC 606 is to recognize revenue in a manner that depicts the transfer of promised goods or services to customers in an amount that reflects the consideration to which the Company expects to be entitled in exchange for those goods or services. The framework in support of this core principle includes: (1) identifying the contract with the customer; (2) identifying the performance obligations in the contract; (3) determining the transaction price; (4) allocating the transaction price to the performance obligations; and (5) recognizing revenue when (or as) the performance obligations are satisfied.

Identifying the Contract with the Customer

The Company identifies contracts with customers as agreements that create enforceable rights and obligations, which typically take the form of customer contracts or purchase orders.

Identifying the Performance Obligations in the Contract

The Company identifies performance obligations as promises in contracts to transfer distinct goods or services. Standard products and services that the Company regularly sells separately are accounted for as distinct performance obligations. Application-specific customer solutions that are comprised of a combination of products and services are accounted for as one performance obligation to deliver a total solution to the customer. On-site support services that are provided to the customer after the solution is deployed are accounted for as a separate performance obligation. These solutions are provided to customers in a variety of industries, including the consumer electronics, logistics, and automotive industries.

Shipping and handling activities for which the Company is responsible under the terms and conditions of the sale are not accounted for as performance obligations but as fulfillment costs. These activities are required to fulfill the Company's promise to transfer the goods and are expensed when revenue is recognized.

The Company does not assess whether promised goods or services are performance obligations if they are immaterial in the context of the contract. If revenue is recognized before immaterial promises have been completed, then the costs related to such immaterial promises are accrued at the time of sale.

Determining the Transaction Price

The Company determines the transaction price as the amount of consideration it expects to receive in exchange for transferring promised goods or services to the customer. Amounts collected from customers for sales taxes are excluded from the transaction price.

If a contract includes a variable amount, such as a rebate, then the Company estimates the transaction price using either the expected value or the most likely amount of consideration to be received, depending upon the specific facts and circumstances. The Company includes estimated variable consideration in the transaction price only to the extent it is probable that a significant reversal of revenue will not occur when the uncertainty is resolved. The Company updates its estimate of variable consideration at the end of each reporting period to reflect changes in facts and circumstances.

Allocating the Transaction Price to the Performance Obligations

The Company allocates the transaction price to each performance obligation at contract inception based on a relative stand-alone selling price basis, or the price at which the Company would sell the good or service separately to similar customers in similar circumstances.

Recognizing Revenue When (or As) the Performance Obligations are Satisfied

The Company recognizes revenue when it transfers the promised goods or services to the customer. Revenue for standard products is recognized at the point in time when the customer obtains control of the goods, which is typically upon delivery when the customer has legal title, physical possession, the risks and rewards of ownership, and an enforceable obligation to pay for the products. Revenue for services, which are not material, is typically recognized over the time the service is provided.

Revenue for application-specific customer solutions is recognized at the point in time when the solution is validated, which is the point in time when the Company can objectively determine that the agreed-upon specifications in the

contract have been met and the customer will accept the performance obligations in the arrangement. Although the customer may have taken legal title and physical possession of the goods when they arrived at the customer's designated site, the significant risks and rewards of ownership transfer to the customer only upon validation. Revenue for on-site support services related to these solutions is recognized over the time the service is provided.

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In certain instances, an arrangement may include customer-specified acceptance provisions or performance guarantees that allow the customer to accept or reject delivered products that do not meet the customer's specifications. If the Company can objectively determine that control of a good or service has been transferred to the customer in accordance with the agreed-upon specifications in the contract, then customer acceptance is a formality. If acceptance provisions are presumed to be substantive, then revenue is deferred until customer acceptance.

For the Company's standard products and services, revenue recognition and billing typically occur at the same time. For application-specific customer solutions, however, the agreement with the customer may provide for billing terms which differ from revenue recognition criteria, resulting in either deferred revenue or unbilled revenue. Credit assessments are performed to determine payment terms, which vary by region, industry, and customer. Prepayment terms result in contract liabilities for customer deposits. When credit is granted to customers, payment is typically due 30 to 90 days from billing. The Company's contracts have an original expected duration of less than one year, and therefore as a practical expedient, the Company has elected to ignore the impact of the time value of money on a contract and to expense sales commissions. The Company recognizes an asset for costs to fulfill a contract if the costs relate directly to the contract and to future performance, and the costs are expected to be recovered.

Management exercises judgment when determining the amount of revenue to be recognized each period. Such judgments include, but are not limited to, assessing the customer's ability and intention to pay substantially all of the contract consideration when due, determining when two or more contracts should be combined and accounted for as a single contract, determining whether a contract modification has occurred, assessing whether promises are immaterial in the context of the contract, determining whether material promises in a contract represent distinct performance obligations, estimating the transaction price for a contract that contains variable consideration, determining the stand-alone selling price of each performance obligation, determining whether control is transferred over time or at a point in time for performance obligations, and assessing whether formal customer acceptance provisions are substantive.

Research and Development

Research and development costs for internally-developed or acquired products are expensed when incurred until technological feasibility has been established for the product. Thereafter, all software costs may be capitalized until the product is available for general release to customers. The Company determines technological feasibility at the time the product reaches beta in its stage of development. Historically, the time incurred between beta and general release to customers has been short, and therefore, the costs have been insignificant.

Advertising Costs

Advertising costs are expensed as incurred and totaled \$1,662,000 in 2018, \$1,679,000 in 2017, and \$1,674,000 in 2016.

Stock-Based Compensation

The Company's share-based payments that result in compensation expense consist of stock option grants and restricted stock awards. The Company has reserved a specific number of shares of its authorized but unissued shares for issuance upon the exercise of stock options or the granting of restricted stock. When a stock option is exercised or a restricted stock award is granted, the Company issues new shares from this pool. The fair values of stock options are estimated on the grant date using a binomial lattice model. Management is responsible for determining the appropriate valuation model and estimating these fair values, and in doing so, considers a number of factors, including information provided by an outside valuation advisor.

The Company recognizes compensation expense related to stock options using the graded attribution method, in which expense is recognized on a straight-line basis over the service period for each separately vesting portion of the stock option as if the option were, in substance, multiple awards. The amount of compensation expense recognized at the end of the vesting period is based upon the number of stock options for which the requisite service has been completed. No compensation expense is recognized for options that are forfeited for which the employee does not render the requisite service. The term "forfeitures" is distinct from "expirations" and represents only the unvested portion of the surrendered option. The Company applies estimated forfeiture rates to its unvested options to arrive at the

amount of compensation expense that is expected to be recognized over the requisite service period. At the end of each separately vesting portion of an option, the expense that was recognized by applying the estimated forfeiture rate is compared to the expense that should be recognized based upon the employee's service, and a credit to expense is recorded related to those employees that have not rendered the requisite service.

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Taxes

The Company recognizes a tax position in its financial statements when that tax position, based solely upon its technical merits, is more likely than not to be sustained upon examination by the relevant taxing authority. Those tax positions failing to qualify for initial recognition are recognized in the first interim period in which they meet the more likely than not standard, or are resolved through negotiation or litigation with the taxing authority, or upon expiration of the statutes of limitations. Derecognition of a tax position that was previously recognized occurs when an entity subsequently determines that a tax position no longer meets the more likely than not threshold of being sustained. Only the portion of the liability that is expected to be paid within one year is classified as a current liability. As a result, liabilities expected to be resolved without the payment of cash (e.g., resolution due to the expiration of the statutes of limitations) or are not expected to be paid within one year are not classified as current. It is the Company's policy to record estimated interest and penalties as income tax expense and tax credits as a reduction in income tax expense.

Deferred tax assets and liabilities are determined based upon the differences between the financial statement and tax bases of assets and liabilities as measured by the enacted tax rates that will be in effect when these differences reverse. Valuation allowances are provided if, based upon the weight of available evidence, it is more likely than not that some or all of the deferred tax assets will not be realized.

Sales tax in the United States and similar taxes in other jurisdictions that are collected from customers and remitted to government authorities are presented on a gross basis (i.e., a receivable from the customer with a corresponding payable to the government). Amounts collected from customers and retained by the Company during tax holidays are recognized as non-operating income when earned.

Net Income Per Share

Basic net income per share is computed by dividing net income available to common shareholders by the weighted-average number of common shares outstanding for the period. Diluted net income per share is computed by dividing net income available to common shareholders by the weighted-average number of common shares outstanding for the period plus potential dilutive common shares. Dilutive common equivalent shares consist of stock options and are calculated using the treasury stock method. Common equivalent shares do not qualify as participating securities. In periods where the Company records a net loss, potential common stock equivalents are not included in the calculation of diluted net loss per share as their effect would be anti-dilutive.

Comprehensive Income

Comprehensive income is defined as the change in equity of a company during a period from transactions and other events and circumstances, excluding transactions resulting from investments by owners and distributions to owners. Accumulated other comprehensive loss, net of tax, as of December 31, 2018 and December 31, 2017, consists of foreign currency translation adjustments of \$37,486,000 and \$33,270,000, respectively; net unrealized losses on available-for-sale investments of \$1,744,000 and \$58,000, respectively; and losses on currency swaps, net of gains on long-term intercompany loans of \$1,271,000 in each year.

Amounts reclassified from accumulated other comprehensive income to investment income on the Consolidated Statements of Operations were net realized gains of \$501,000, \$829,000, and \$191,000 for 2018, 2017, and 2016, respectively.

Concentrations of Risk

Financial instruments that potentially subject the Company to concentrations of credit risk consist primarily of cash, cash equivalents, investments, and trade receivables. The Company has certain domestic and foreign cash balances that exceed the insured limits set by the Federal Deposit Insurance Corporation (FDIC) in the United States and equivalent regulatory agencies in foreign countries. The Company primarily invests in investment-grade debt securities and has established guidelines relative to credit ratings, diversification, and maturities of its debt securities that maintain safety and liquidity. The Company has not experienced any significant realized losses on its debt securities.

The Company performs ongoing credit evaluations of its customers and maintains allowances for potential credit losses. The Company has not experienced any significant losses related to the collection of its accounts receivable.

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A significant portion of the Company's product is manufactured by a third-party contractor located in Indonesia. This contractor has agreed to provide Cognex with termination notification periods and last-time-buy rights, if and when that may be applicable. We rely upon this contractor to provide quality product and meet delivery schedules. We engage in extensive product quality programs and processes, including actively monitoring the performance of our third-party manufacturers; however, we may not detect all product quality issues through these programs and processes.

Certain components are presently sourced from a single vendor that is selected based on price and performance considerations. In the event of a supply disruption from a single-source vendor, these components may be purchased from alternative vendors, which may result in manufacturing delays based on the lead time of the new vendor. Certain key electronic and mechanical components that are purchased from strategic suppliers, such as processors or imagers, are fundamental to the design of Cognex products. A disruption in the supply of these key components, such as a last-time-buy announcement, natural disaster, financial bankruptcy, or other event, may require us to purchase a significant amount of inventory at unfavorable prices resulting in lower gross margins and higher risk of carrying excess inventory. If we are unable to secure adequate supply from alternative sources, we may have to redesign our products, which may lead to a delay in manufacturing and a possible loss of sales.

Derivative Instruments

Derivative instruments are recorded on the Consolidated Balance Sheets at fair value. Changes in the fair value of derivatives are recorded each period in current operations or in shareholders' equity as other comprehensive income (loss), depending upon whether the derivative is designated as a hedge transaction and, if it is, the effectiveness of the hedge. At the inception of the contract, the Company designates foreign currency forward exchange contracts as either a cash flow hedge of certain forecasted foreign currency denominated sales and purchase transactions or as an economic hedge. Changes in the fair value of a derivative that is highly effective and that is designated and qualifies as a cash flow hedge are recorded in shareholders' equity as other comprehensive income (loss), and reclassified into current operations in the same period during which the hedged transaction affects current operations and in the same financial statement line item as that of the forecasted transaction. Cash flow hedges are evaluated for effectiveness quarterly. Any hedge ineffectiveness (which represents the amount by which the changes in the fair value of the derivative exceed the variability in the cash flows of the forecasted transaction) is recorded in current operations in the period in which ineffectiveness is determined. Changes in the fair value of the Company's economic hedges (not designated as a cash flow hedge) are reported in current operations. The cash flows from derivative instruments are presented in the same category on the Consolidated Statements of Cash Flows as the category for the cash flows from the hedged item. Generally, this accounting policy election results in cash flows related to derivative instruments being classified as an operating activity on the Consolidated Statements of Cash Flows.

The Company formally documents all relationships between hedging instruments and hedged items, as well as its risk-management objective and strategy for undertaking various hedge transactions. This process includes linking all derivatives that are designated as cash flow hedges to specific forecasted transactions. The Company also formally assesses (both at the hedge's inception and on an ongoing basis) whether the derivatives that are used in hedging transactions have been highly effective in offsetting changes in the fair value or cash flows of hedged items and whether those derivatives may be expected to remain highly effective in future periods. When it is determined that a derivative is not (or has ceased to be) highly effective as a hedge, the Company discontinues hedge accounting prospectively, as discussed below.

The Company discontinues hedge accounting prospectively when (1) it determines that the derivative is no longer effective in offsetting changes in the cash flows of a hedged item; (2) the derivative expires or is sold, terminated, or exercised; (3) it is no longer probable that the forecasted transaction will occur; or (4) management determines that designating the derivative as a hedging instrument is no longer appropriate or desired. When the Company discontinues hedge accounting because it is no longer probable that the forecasted transaction will occur in the originally expected period, the gain or loss on the derivative remains in accumulated other comprehensive income (loss) and is reclassified into current operations when the forecasted transaction affects current operations. However, if

it is probable that a forecasted transaction will not occur by the end of the originally specified time period or within an additional two-month period of time thereafter, the gain or loss that was accumulated in other comprehensive income (loss) is recognized immediately in current operations. In all situations in which hedge accounting is discontinued and the derivative remains outstanding, the Company carries the derivative at fair value on the Consolidated Balance Sheets, recognizing changes in the fair value in current operations, unless it is designated in a new hedging relationship.

The Company recognizes all derivative instruments as either current assets or current liabilities at fair value on the Consolidated Balance Sheets. When the Company is engaged in more than one outstanding derivative contract with the same counterparty and also has a legally enforceable master netting agreement with that counterparty, the “net”

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mark-to-market exposure represents the netting of the positive and negative exposures with that counterparty. Accordingly, cash flow hedges are presented net on the Consolidated Balance Sheets.

Business Combinations

The Company determines whether a transaction qualifies as a business combination by applying the definition of a business, which requires the assets acquired and liabilities assumed to be inputs and processes that have the ability to contribute to the creation of outputs. The Company accounts for business combinations under the acquisition method of accounting, which requires the following steps: (1) identifying the acquirer, (2) determining the acquisition date, (3) recognizing and measuring the identifiable assets acquired and the liabilities assumed, and (4) recognizing and measuring goodwill. The Company measures the identifiable assets acquired and liabilities assumed at their estimated fair values as of the acquisition date. Management is responsible for determining the appropriate valuation model and estimated fair values, and in doing so, considers a number of factors, including information provided by an outside valuation advisor. Management primarily establishes fair value using the income approach based upon a discounted cash flow model. The income approach requires the use of many assumptions and estimates including future revenues and expenses, as well as discount factors. Contingent consideration liabilities are reported at their estimated fair values based upon probability-adjusted present values of the consideration expected to be paid, using significant inputs and estimates. Key assumptions used in these estimates include probability assessments with respect to the likelihood of achieving certain milestones and discount rates consistent with the level of risk of achievement. The fair values of these contingent consideration liabilities are remeasured each reporting period with changes in fair value recorded in "Other income (expense)" on the Consolidated Statements of Operations. Goodwill is recognized as of the acquisition date as the excess of the consideration transferred over the net amount of assets acquired and liabilities assumed.

Transaction costs are expensed as incurred.

NOTE 2: New Pronouncements

Accounting Standards Update (ASU) 2016-02, 2018-11, and 2018-20, "Leases"

ASU 2016-02 creates Topic 842, Leases. The objective of this ASU is 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. This ASU applies to any entity that enters into a lease, although lessees will see the most significant changes. The main difference between prior GAAP and Topic 842 is the recognition of lease assets and lease liabilities on the balance sheet for those leases classified as operating leases under prior GAAP. Topic 842 distinguishes between finance leases and operating leases, which are substantially similar to the classification criteria for distinguishing between capital leases and operating leases under prior GAAP. For public companies, the guidance in ASU 2016-02 is effective for annual periods beginning after December 15, 2018, and interim periods within those fiscal years.

In July 2018, the Financial Accounting Standards Board issued ASU 2018-11 to amend ASU 2016-02 and provided an additional (and optional) transition method to adopt the new lease standard. This transition method allows entities to apply the new lease standard at the adoption date and recognize a cumulative-effect adjustment to the opening balance of retained earnings in the period of adoption instead of using the original modified retrospective transition method of adoption which required the restatement of all prior-period financial statements. Under this new transition method, the comparative periods in the financial statements will continue to be presented in accordance with prior GAAP. Management will adopt the new lease standard on a prospective basis using this new transition method under ASU 2018-11. In December 2018, the Financial Accounting Standards Board issued ASU 2018-20 to provide additional implementation guidance.

As of the date of this report, management has determined the scope of leases subject to the new accounting requirements, completed the implementation of a lease software package to assist with compliance, trained relevant employees, and finalized the lease accounting policy as well as the related business processes and internal controls. Management expects the adoption of the new lease rule will result in the recognition of lease assets and lease liabilities of approximately \$20,000,000 on the Consolidated Balance Sheet. Management does not expect the adoption to have a significant impact on the Statement of Operations or Statement of Cash Flows. Furthermore, the

adoption of this rule will result in additional lease disclosures.

Accounting Standards Update (ASU) 2016-13, "Financial Instruments - Measurement of Credit Losses"

ASU 2016-13 applies to all reporting entities holding financial assets that are not accounted for at fair value through net income (debt securities). The amendments in this ASU eliminate the probable initial recognition threshold to recognize a credit loss under current GAAP and, instead, reflect an entity's current estimate of all expected credit losses. In addition, this ASU broadens the information an entity must consider in developing the credit loss estimate,

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including the use of reasonable and supportable forecasted information. The amendments in this ASU require that credit losses on available-for-sale debt securities be presented as an allowance rather than as a write-down and an entity will be able to record reversals of credit losses in current period net income. For public companies, the guidance in ASU 2016-13 is effective for annual periods beginning after December 15, 2019, and interim periods within those fiscal years. This ASU should be applied through a cumulative-effect adjustment to retained earnings as of the beginning of the first reporting period in which the guidance is effective. Management does not expect ASU 2016-13 to have a material impact on the Company's financial statements and disclosures.

Accounting Standards Update (ASU) 2017-08, "Receivables - Nonrefundable Fees and Other Costs - Premium Amortization on Purchased Callable Debt Securities"

ASU 2017-08 applies to all reporting entities that hold investments in callable debt securities that have an amortized cost basis in excess of the amount that is repayable by the issuer at the earliest call date (that is, at a premium). The amendments in this ASU shorten the amortization period for certain callable debt securities held at a premium. Specifically, the amendments require the premium to be amortized to the earliest call date. The amendments do not require an accounting change for securities held at a discount; the discount continues to be amortized to maturity. Under current GAAP, premiums and discounts on callable debt securities generally are amortized to the maturity date. If that callable debt security is subsequently called, the entity records a loss equal to the unamortized premium. The amendments in this ASU more closely align the amortization period of premiums and discounts to expectations incorporated in market pricing on the underlying securities. For public companies, the amendments in ASU 2017-08 are effective for annual periods beginning after December 15, 2019, and interim reporting periods within fiscal years beginning after December 15, 2020. This ASU should 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, and, in the period of adoption, the entity is required to provide disclosures about the change in accounting principle. Early adoption is permitted, including adoption in an interim period. Management does not expect ASU 2017-08 to have a material impact on the Company's financial statements and disclosures.

Accounting Standards Update (ASU) 2017-12, "Derivatives and Hedging - Targeted Improvements to Accounting for Hedging Activities"

ASU 2017-12 applies to all reporting entities that elect to apply hedge accounting. The hedge accounting requirements under current GAAP sometimes do not permit an entity to properly recognize the economic results of the hedging strategy in the financial statements, and they are difficult to understand and interpret. The amendments in this ASU make certain targeted improvements to simplify the application of the hedge accounting guidance. Also, they better align the risk management activities and financial reporting for hedging relationships through changes to both 1) the designation and measurement guidance for qualifying hedging relationships and 2) the presentation of hedge results. For public companies, the amendments in ASU 2017-12 are effective for annual reporting periods beginning after December 15, 2018, and interim reporting periods within those fiscal years. Early adoption is permitted including adoption in any interim period after issuance of the ASU. All transition requirements and elections should be applied to hedging relationships existing on the date of adoption. The entity should apply a cumulative-effect adjustment related to eliminating the separate measurement of ineffectiveness to accumulated other comprehensive income with a corresponding adjustment to the opening balance of retained earnings as of the beginning of the fiscal year that an entity adopts the amendments in this ASU. The amended presentation and disclosure guidance is required only prospectively. Management does not expect ASU 2017-12 to have a material impact on the Company's financial statements and disclosures.

Accounting Standards Update (ASU) 2018-01, "Land Easement Practical Expedient for Transition to Topic 842"

ASU 2018-01 applies to entities with land easements that exist or expired before an entity's adoption of Topic 842, provided that the entity does not account for those land easements as leases under Topic 840. The amendments in this ASU permit an entity to elect an optional transition practical expedient to not evaluate under Topic 842 land easements that exist or expired before the entity's adoption of Topic 842 and that were not previously accounted for as leases under Topic 840. An entity that elects this practical expedient should apply the practical expedient consistently

to all of its existing or expired land easements that were not previously accounted for as leases under Topic 840. Once an entity adopts Topic 842, it should apply that Topic prospectively to all new (or modified) land easements to determine whether the arrangement should be accounted for as a lease. An entity that does not elect this practical expedient should evaluate all existing or expired land easements in connection with the adoption of the new lease requirements in Topic 842 to assess whether they meet the definition of a lease. The amendments in this ASU affect the amendments in ASU 2016-02, which are not yet effective but may be early adopted. The effective date and transition requirements for the amendments are the same as the effective date and transition requirements in ASU 2016-02, which is for annual

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periods beginning after December 15, 2018, and interim periods within those fiscal years. Management does not expect ASU 2018-01 to have a material impact on the Company's financial statements and disclosures.

Accounting Standards Update (ASU) 2018-02, "Income Statement - Reporting Comprehensive Income"

ASU 2018-02 applies to entities required to apply the provisions of Topic 220, Income Statement - Reporting Comprehensive Income, and has items of other comprehensive income for which the related tax effects are presented in other comprehensive income as required by GAAP. The amendments in this ASU allow a reclassification from accumulated other comprehensive income to retained earnings for stranded tax effects resulting from the Tax Cuts and Jobs Act of 2017 (the "Tax Act"). Consequently, the amendments eliminate the stranded tax effects resulting from the Tax Act and will improve the usefulness of information reported to financial statement users. However, because the amendments only relate to the reclassification of the income tax effects of the Tax Act, the underlying guidance that requires the effect of a change in tax laws or rates to be included in income from continuing operations is not affected. The amendments in this ASU also require certain disclosures about stranded tax effects. The amendments in this ASU are effective for all entities for fiscal years beginning after December 15, 2018, and interim periods within those fiscal years. Early adoption of the amendments in this ASU is permitted, including adoption in any interim period. The amendments in this ASU should be applied either in the period of adoption or retrospectively to each period (or periods) in which the effect of the change in the U.S. federal corporate income tax rate in the Tax Act is recognized. Management does not expect ASU 2018-02 to have a material impact on the Company's financial statements and disclosures.

Accounting Standards Update (ASU) 2018-07, "Compensation - Stock Compensation - Improvements to Nonemployee Share-Based Payment Accounting"

ASU 2018-07 applies to all entities that enter into share-based payment transactions for acquiring goods and services from nonemployees. The amendments in this ASU expand the scope of Topic 718, Compensation - Stock Compensation, to include share-based payments transactions to nonemployees. Changes to the accounting for nonemployee awards as a result of this ASU include: 1) equity-classified nonemployee share-based payment awards are measured at the grant date, instead of the previous requirement to remeasure the awards through the performance completion date, 2) for awards with performance conditions, compensation cost is recognized when the achievement of the performance condition is probable, rather than upon achievement, and 3) the current requirement to reassess the classification (equity or liability) for nonemployee awards upon vesting is eliminated. This ASU clarifies that Topic 718 does not apply to financing transactions or awards granted to customers as part of a contract accounted for under Topic 606, Revenue from Contracts with Customers. The amendments in this ASU are effective for public business entities for fiscal years beginning after December 15, 2018, and interim periods within those fiscal years. An entity should only remeasure liability-classified awards that have not been settled by the date of adoption and equity-classified awards for which the measurement date has not been established through a cumulative-effect adjustment to retained earnings as of the beginning of the fiscal year of adoption. Management does not expect ASU 2018-07 to have a material impact on the Company's financial statements and disclosures.

Accounting Standards Update (ASU) 2018-15, "Intangibles - Goodwill and Other - Internal-Use Software"

ASU 2018-15 applies to entities that are a customer in a hosting arrangement that is a service contract. The amendments in this ASU align the requirements for capitalizing implementation costs incurred in a hosting arrangement that is a service contract with the requirements for capitalizing implementation costs incurred to develop or obtain internal-use software. Accordingly, the amendments in this ASU require an entity in a hosting arrangement that is a service contract to follow the guidance in Subtopic 350-40 to determine which implementation costs to capitalize as an asset related to the service contract and which costs to expense. Further, it requires the entity to expense the capitalized implementation costs over the term of the hosting arrangement. In addition, it requires the presentation of the expenses related to the capitalized implementation costs in the same line item in the statement of income as the fees associated with the hosting element of the arrangement and the classification of the payments for the capitalized implementation costs in the statement of cash flows in the same manner as the payments made for the fees associated with the hosting element. The amendments in this ASU are effective for public entities for fiscal years

beginning after December 15, 2019, and interim periods within those fiscal years, with early adoption permitted. Management does not expect ASU 2018-15 to have a material impact on the Company's financial statement and disclosures.

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NOTE 3: Fair Value Measurements

Financial Assets and Liabilities that are Measured at Fair Value on a Recurring Basis

The following table summarizes the financial assets and liabilities measured at fair value on a recurring basis as of December 31, 2018 (in thousands):

	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Unobservable Inputs (Level 3)
Assets:			
Money market instruments	\$ 3,557	\$ —	\$ —
Corporate bonds	—	300,437	—
Treasury bills	—	231,237	—
Asset-backed securities	—	132,038	—
Sovereign bonds	—	14,417	—
Agency bonds	—	5,921	—
Municipal bonds	—	5,337	—
Economic hedge forward contracts	—	1	—
Liabilities:			
Economic hedge forward contracts	—	106	—
Contingent consideration liabilities	—	—	2,544

The Company's money market instruments are reported at fair value based upon the daily market price for identical assets in active markets, and are therefore classified as Level 1.

The Company's debt securities and forward contracts are reported at fair value based upon model-driven valuations in which all significant inputs are observable or can be derived from or corroborated by observable market data for substantially the full term of the asset or liability, and are therefore classified as Level 2. Management is responsible for estimating the fair value of these financial assets and liabilities, and in doing so, considers valuations provided by a large, third-party pricing service. For debt securities, this service maintains regular contact with market makers, brokers, dealers, and analysts to gather information on market movement, direction, trends, and other specific data.

They use this information to structure yield curves for various types of debt securities and arrive at the daily valuations. The Company's forward contracts are typically traded or executed in over-the-counter markets with a high degree of pricing transparency. The market participants are generally large commercial banks.

The Company did not record an other-than-temporary impairment of these financial assets in 2018, 2017, or 2016.

The Company's contingent consideration liabilities are reported at fair value based upon probability-adjusted present values of the consideration expected to be paid, using significant inputs that are not observable in the market, and are therefore classified as Level 3. Key assumptions used in these estimates include probability assessments with respect to the likelihood of achieving certain revenue milestones. The fair values of these contingent consideration liabilities were calculated using discount rates consistent with the level of risk of achievement, and are remeasured each reporting period with changes in fair value recorded in "Other income (expense)" on the Consolidated Statements of Operations.

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The following table summarizes the activity for the Company's liabilities measured at fair value using Level 3 inputs (in thousands):

Balance as of December 31, 2016	\$4,173
Payment of EnShape contingent consideration	(1,401)
Payment of Manatee contingent consideration	(525)
Contingent consideration resulting from GVi acquisition	1,299
Fair value adjustment to Manatee contingent consideration	(325)
Fair value adjustment to Chiaro contingent consideration	15
Fair value adjustment to GVi contingent consideration	282
Foreign exchange rate changes	39
Balance as of December 31, 2017	3,557
Fair value adjustment to Manatee contingent consideration	(1,350)
Fair value adjustment to Chiaro contingent consideration	282
Fair value adjustment to GVi contingent consideration	1,065
Payment of GVi contingent consideration	(1,000)
Balance as of December 31, 2018	\$2,554

Non-financial Assets that are Measured at Fair Value on a Non-recurring Basis

Non-financial assets such as property, plant, and equipment, goodwill, and intangible assets are required to be measured at fair value only when an impairment loss is recognized. In 2017, the Company determined that the carrying value of the customer relationships arising from the AQSense acquisition was impaired and reduced this value to zero, resulting in an impairment charge of \$469,000. The Company did not record an impairment charge related to non-financial assets in 2018 or 2016.

Refer to Note 21 to the Consolidated Financial Statements for further information regarding acquisitions.

NOTE 4: Cash, Cash Equivalents, and Investments

Cash, cash equivalents, and investments consisted of the following (in thousands):

	December 31,	
	2018	2017
Cash	\$104,655	\$97,951
Money market instruments	3,557	8,631
Cash and cash equivalents	108,212	106,582
Treasury bills	198,477	150,371
Corporate bonds	137,871	47,395
Asset-backed securities	78,407	59,203
Sovereign bonds	8,101	21,579
Municipal bonds	4,492	8,805
Agency bonds	—	10,608
Short-term investments	427,348	297,961
Corporate bonds	162,566	296,014
Asset-backed securities	53,631	71,727
Treasury bills	32,760	23,459
Sovereign bonds	6,316	13,147
Agency bonds	5,921	14,890
Municipal bonds	845	4,204
Long-term investments	262,039	423,441
	\$797,599	\$827,984

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The Company's cash balance included foreign bank balances totaling \$67,502,000 and \$66,777,000 as of December 31, 2018 and 2017, respectively.

Treasury bills consist of debt securities issued by the U.S. government; corporate bonds consist of debt securities issued by both domestic and foreign companies; asset-backed securities consist of debt securities collateralized by pools of receivables or loans with credit enhancement; sovereign bonds consist of direct debt issued by foreign governments; municipal bonds consist of debt securities issued by state and local government entities; agency bonds consist of domestic or foreign obligations of government agencies and government-sponsored enterprises that have government backing.

The following table summarizes the Company's available-for-sale investments as of December 31, 2018 (in thousands):

	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
Short-term:				
Treasury bills	\$ 198,512	\$ 38	\$ (73)	\$ 198,477
Corporate bonds	138,219	27	(375)	137,871
Asset-backed securities	78,628	15	(236)	78,407
Sovereign bonds	8,135	—	(34)	8,101
Municipal bonds	4,492	—	—	4,492
Long-term:				
Corporate bonds	163,847	107	(1,388)	162,566
Asset-backed securities	53,693	55	(117)	53,631
Treasury bills	32,722	51	(13)	32,760
Sovereign bonds	6,286	30	—	6,316
Agency bonds	5,930	—	(9)	5,921
Municipal bonds	855	—	(10)	845
	\$ 691,319	\$ 323	\$ (2,255)	\$ 689,387

The following table summarizes the Company's gross unrealized losses and fair values for available-for-sale investments in an unrealized loss position as of December 31, 2018 (in thousands):

	Unrealized Loss Position For Less than 12 Months		Unrealized Loss Position For Greater than 12 Months		Total	
	Fair Value	Unrealized Losses	Fair Value	Unrealized Losses	Fair Value	Unrealized Losses
Corporate bonds	\$ 145,596	\$ (1,268)	\$ 99,886	\$ (495)	\$ 245,482	\$ (1,763)
Treasury bills	114,836	(73)	\$ 13,850	(13)	128,686	(86)
Asset-backed securities	47,762	(91)	44,585	(262)	92,347	(353)
Sovereign bonds	3,492	(4)	4,609	(30)	8,101	(34)
Agency Bonds	5,920	(9)	—	—	5,920	(9)
Municipal bonds	1,302	—	845	(10)	2,147	(10)
	\$ 318,908	\$ (1,445)	\$ 163,775	\$ (810)	\$ 482,683	\$ (2,255)

As of December 31, 2018, the Company did not recognize any other-than-temporary impairment of these investments. In its evaluation, management considered the type of security, the credit rating of the security, the length of time the security has been in a loss position, the size of the loss position, our intent and ability to hold the security to expected recovery of value, and other meaningful information. The Company does not intend to sell, and is unlikely to be required to sell, any of these available-for-sale investments before its effective maturity or market price recovery.

The Company recorded gross realized gains on the sale of debt securities totaling \$669,000 in 2018, \$929,000 in 2017, and \$292,000 in 2016, and gross realized losses on the sale of debt securities totaling \$168,000 in 2018, \$100,000 in 2017, and \$101,000 in 2016. These gains and losses are included in "Investment income" on the Consolidated Statement of Operations. Prior to the sale of these securities, unrealized gains and losses for these debt securities, net of tax, are recorded in shareholders' equity as other comprehensive income (loss).

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The following table summarizes the effective maturity dates of the Company's available-for-sale investments as of December 31, 2018 (in thousands):

	<1 Year	1-2 Years	2-3 Years	3-4 Years	4-5 Years	5-7 Years	Total
Corporate bonds	\$ 137,871	\$ 81,921	\$ 56,459	\$ 20,060	\$ 4,126	\$ —	\$ 300,437
Treasury bills	198,477	32,760	—	—	—	—	231,237
Asset-backed securities	78,407	27,665	7,715	11,004	3,416	3,831	132,038
Sovereign bonds	8,101	6,316	—	—	—	—	14,417
Agency bonds	—	—	—	5,921	—	—	5,921
Municipal bonds	4,492	845	—	—	—	—	5,337
	\$ 427,348	\$ 149,507	\$ 64,174	\$ 36,985	\$ 7,542	\$ 3,831	\$ 689,387

NOTE 5: Inventories

Inventories consisted of the following (in thousands):

	December 31,	
	2018	2017
Raw materials	\$ 42,738	\$ 33,927
Work-in-process	3,435	2,114
Finished goods	37,109	31,882
	\$ 83,282	\$ 67,923

NOTE 6: Property, Plant, and Equipment

Property, plant, and equipment consisted of the following (in thousands):

	December 31,	
	2018	2017
Land	\$ 3,951	\$ 3,951
Buildings	24,533	24,589
Building improvements	45,067	33,189
Leasehold improvements	9,095	6,513
Computer hardware and software	66,542	61,835
Manufacturing test equipment	27,378	21,312
Furniture and fixtures	6,904	6,363
	183,470	157,752
Less: accumulated depreciation	(92,074)	(79,704)
	\$ 91,396	\$ 78,048

The cost of disposed property, plant, and equipment totaling \$6,367,000 and \$6,327,000 was removed from both the asset and accumulated depreciation balances in 2018 and 2017, respectively. Gains and losses on these disposals were immaterial in both periods.

Buildings include rental property with a cost basis of \$800,000 and \$5,750,000 as of December 31, 2018 and 2017, respectively, and accumulated depreciation of \$234,000 and \$3,069,000 as of December 31, 2018 and 2017, respectively.

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NOTE 7: Goodwill

The changes in the carrying value of goodwill were as follows (in thousands):

	Amount
Balance as of December 31, 2016	\$95,280
Acquisition of ViDi Systems, S.A.	18,333
Acquisition of GVi Ventures, Inc.	1,476
Adjustment to EnShape goodwill	(1,881)
Balance as of December 31, 2017	113,208
Balance as of December 31, 2018	\$113,208

Refer to Note 21 to the Consolidated Financial Statements for further information regarding acquisitions.

For its 2018 analysis of goodwill, management elected to perform a qualitative assessment. Based upon this assessment, management believes that it is more likely than not that the fair value of the reporting unit exceeds its carrying amount. Factors that management considered in the qualitative assessment include macroeconomic conditions, industry and market considerations, overall financial performance (both current and projected), changes in management or strategy, changes in the composition or carrying amount of net assets, and market capitalization.

NOTE 8: Intangible Assets

Amortized intangible assets consisted of the following (in thousands):

	Gross Carrying Value	Accumulated Amortization	Net Carrying Value
Distribution networks	\$38,060	\$ 38,060	\$—
Completed technologies	13,687	6,619	7,068
Customer relationships	8,607	5,716	2,891
Non-compete agreements	370	216	154
Balance as of December 31, 2018	\$60,724	\$ 50,611	\$10,113

	Gross Carrying Value	Accumulated Amortization	Net Carrying Value
Distribution networks	\$38,060	\$ 38,060	\$—
Completed technologies	13,687	4,181	9,506
Customer relationships	8,607	5,202	3,405
Non-compete agreements	370	92	278
Balance as of December 31, 2017	\$60,724	\$ 47,535	\$13,189

Estimated amortization expense for each of the five succeeding fiscal years and thereafter is as follows (in thousands):

Year Ended December 31,	Amount
2019	\$2,701
2020	2,185
2021	2,017
2022	1,691
2023	989
Thereafter	530
	\$10,113

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NOTE 9: Accrued Expenses

Accrued expenses consisted of the following (in thousands):

	December 31,	
	2018	2017
Salaries, commissions, and payroll taxes	\$11,039	\$9,944
Company bonuses	9,134	13,721
Vacation	6,507	5,479
Foreign retirement obligations	4,816	4,260
Warranty obligations	4,743	4,701
Acquisition deferred and contingent liabilities	431	6,022
Other	23,550	24,122
	\$60,220	\$68,249

The changes in the warranty obligation were as follows (in thousands):

Balance as of December 31, 2016	\$4,335
Provisions for warranties issued during the period	2,843
Fulfillment of warranty obligations	(3,109)
Foreign exchange rate changes	632
Balance as of December 31, 2017	4,701
Provisions for warranties issued during the period	4,184
Fulfillment of warranty obligations	(4,024)
Foreign exchange rate changes	(118)
Balance as of December 31, 2018	\$4,743

NOTE 10: Commitments and Contingencies

Commitments

As of December 31, 2018, the Company had outstanding purchase orders totaling \$11,097,000 to purchase inventory from various vendors. Certain of these purchase orders may be canceled by the Company, subject to cancellation penalties. These purchase commitments relate to expected sales in 2018.

The Company conducts certain of its operations in leased facilities. These lease agreements expire at various dates through 2025 and are accounted for as operating leases. Certain of these leases contain renewal options, retirement obligations, escalation clauses, rent holidays, and leasehold improvement incentives. Annual rental expense totaled \$8,186,000 in 2018, \$6,738,000 in 2017, and \$6,090,000 in 2016.

Future minimum rental payments under these agreements are as follows (in thousands):

Year Ended December 31,	Amount
2019	\$7,086
2020	5,227
2021	4,109
2022	2,918
2023	2,209
Thereafter	1,198
	\$22,747

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The Company owns a building adjacent to its corporate headquarters that is partially occupied with a tenant who has a lease agreements that will expire in 2022. The Company had an additional tenant whose lease expired in November 2018. Annual rental income totaled \$1,116,000 in 2018, \$1,474,000 in 2017, and \$1,911,000 in 2016. Rental income and related expenses are included in “Other income (expense)” on the Consolidated Statements of Operations. Future minimum rental receipts under non-cancelable lease agreements are as follows (in thousands):

Year Ended December 31,	Amount
2019	307
2020	307
2021	307
2022	307
	\$ 1,228

Contingencies

Various claims and legal proceedings generally incidental to the normal course of business are pending or threatened on behalf of or against the Company. While we cannot predict the outcome of these matters, we believe that any liability arising from them will not have a material adverse effect on our financial position, liquidity, or results of operations.

NOTE 11: Indemnification Provisions

Except as limited by Massachusetts law, the by-laws of the Company require it to indemnify certain current or former directors, officers, and employees of the Company against expenses incurred by them in connection with each proceeding in which he or she is involved as a result of serving or having served in certain capacities. Indemnification is not available with respect to a proceeding as to which it has been adjudicated that the person did not act in good faith in the reasonable belief that the action was in the best interests of the Company. The maximum potential amount of future payments the Company could be required to make under these provisions is unlimited. The Company has never incurred significant costs related to these indemnification provisions. As a result, the Company believes the estimated fair value of these provisions is not material.

In the ordinary course of business, the Company may accept standard limited indemnification provisions in connection with the sale of its products, whereby it indemnifies its customers for certain direct damages incurred in connection with third-party patent or other intellectual property infringement claims with respect to the use of the Company’s products. The maximum potential amount of future payments the Company could be required to make under these provisions is generally subject to fixed monetary limits. The Company has never incurred significant costs to defend lawsuits or settle claims related to these indemnification provisions. As a result, the Company believes the estimated fair value of these provisions is not material.

In the ordinary course of business, the Company also accepts limited indemnification provisions from time to time, whereby it indemnifies customers for certain direct damages incurred in connection with bodily injury and property damage arising from the use of the Company’s products. The maximum potential amount of future payments the Company could be required to make under these provisions is generally limited and is likely recoverable under the Company’s insurance policies. As a result of this coverage, and the fact that the Company has never incurred significant costs to defend lawsuits or settle claims related to these indemnification provisions, the Company believes the estimated fair value of these provisions is not material.

Under the terms of the Company’s sale of its Surface Inspection Systems Division (SISD) to AMETEK, Inc., the Company agreed to retain certain liabilities in connection with its business dealings occurring prior to the transaction closing date of July 6, 2015, and to indemnify AMETEK, Inc. in connection with these retained liabilities and for any breach of the representations and warranties made by the Company to AMETEK, Inc. in connection with the sale agreement itself, as is usual and customary in such transactions. A binding arbitration was concluded in 2016 with respect to certain product performance claims made by an SISD customer, for which the Company remained responsible under the indemnity provisions of the sale transaction. In that proceeding, the tribunal ordered the Company to pay the customer approximately \$326,000, primarily representing a refund of the product purchase price.

The tribunal also ordered the customer to pay the Company approximately \$45,000, primarily representing reimbursement of legal fees. The net settlement of \$281,000 was recorded in discontinued operations in 2016.

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NOTE 12: Derivative Instruments

The Company's foreign currency risk management strategy is principally designed to mitigate the potential financial impact of changes in the value of transactions and balances denominated in foreign currencies resulting from changes in foreign currency exchange rates. The Company enters into two types of hedges to manage this risk. The first are economic hedges which utilize foreign currency forward contracts with maturities of up to 45 days to manage the exposure to fluctuations in foreign currency exchange rates arising primarily from foreign-denominated receivables and payables. The gains and losses on these derivatives are intended to be offset by the changes in the fair value of the assets and liabilities being hedged. These economic hedges are not designated as hedging instruments for hedge accounting treatment. The second are cash flow hedges which utilize foreign currency forward contracts with maturities of up to 18 months to hedge specific forecasted transactions of the Company's foreign subsidiaries with the goal of protecting our budgeted revenues and expenses against foreign currency exchange rate changes compared to our budgeted rates. These cash flow hedges are designated as hedging instruments for hedge accounting treatment. The Company did not have any cash flow hedges as of December 31, 2018 and 2017.

The Company had the following outstanding forward contracts (in thousands):

Currency	December 31, 2018		December 31, 2017	
	Notional Value	USD Equivalent	Notional Value	USD Equivalent

Derivatives Not Designated as Hedging Instruments:

Euro	23,000	\$ 26,330	—	\$ —
Japanese Yen	380,000	3,459	455,000	4,049
British Pound	2,500	3,204	1,650	2,232
Korean Won	3,125,000	2,808	1,825,000	1,708
Hungarian Forint	750,000	2,685	545,000	2,110
Taiwanese Dollar	55,000	1,807	37,725	1,278
Canadian Dollar	990	726	—	—
Singapore Dollar	700	514	—	—
Swiss Franc	—	—	1,365	1,401

Information regarding the fair value of the outstanding forward contracts was as follows (in thousands):

	Asset Derivatives		Liability Derivatives	
	Balance Sheet Location	Fair Value December 31, 2018	Balance Sheet Location	Fair Value December 31, 2017
Derivatives Not Designated as Hedging Instruments:				
Economic hedge forward contracts	Prepaid expenses and other current assets	\$ 1 \$ 16	Accrued expenses	\$ 106 \$ 13

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The following table summarizes the gross activity for all derivative assets and liabilities which were presented on a net basis on the Consolidated Balance Sheets due to the right of offset with each counterparty (in thousands):

Asset Derivatives	December 31		Liability Derivatives	December 31	
	2018	2017		2018	2017
Gross amounts of recognized assets	\$ 1	\$ 16	Gross amounts of recognized liabilities	\$ 106	\$ 13
Gross amounts offset	—	—	Gross amounts offset	—	—
Net amount of assets presented	\$ 1	\$ 16	Net amount of liabilities presented	\$ 106	\$ 13

Information regarding the effect of derivative instruments, net of the underlying exposure, on the consolidated financial statements was as follows (in thousands):

	Location in Financial Statements	Year Ended		
		December 31,		
		2018	2017	2016
Derivatives Designated as Hedging Instruments:				
Gains (losses) recorded in shareholders' equity (effective portion)	Accumulated other comprehensive income (loss), net of tax	\$—	\$—	\$37
Gains (losses) reclassified from accumulated other comprehensive income (loss) into current operations (effective portion)	Revenue	\$—	\$30	\$(438)
	Research, development, and engineering expenses	—	3	13
	Selling, general, and administrative expenses	—	8	27
	Total gains (losses) reclassified from accumulated other comprehensive income (loss) into current operations	\$—	\$41	\$(398)

Derivatives Not Designated as Hedging Instruments:

Gains (losses) recognized in current operations Foreign currency gain (loss) \$(285) \$270 \$(515)

The following table summarizes the changes in accumulated other comprehensive income (loss), net of tax, related to derivative instruments (in thousands):

Balance as of December 31, 2016	\$37
Net unrealized gain (loss) on cash flow hedges	4
Reclassification of net realized (gain) loss on cash flow hedges into current operations	(41)
Balance as of December 31, 2017	—
Balance as of December 31, 2018	\$—

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NOTE 13: Revenue Recognition

On January 1, 2018, the Company adopted Accounting Standards Codification (ASC) 606, "Revenue from Contracts with Customers," using the full retrospective method to present all periods reported on a consistent basis. Accordingly, prior-period results have been restated to apply the provisions of this ASC.

As a result of this adoption, revenue for software-only products sold as part of multiple-deliverable arrangements are no longer deferred when vendor-specific objective evidence of fair value does not exist for the undelivered elements of the arrangement. This change results in earlier recognition of revenue. In addition, certain of the Company's product accessory sales, which were reported on a net basis, are now reported on a gross basis as a result of applying the expanded guidance in the new standard related to principal versus agent considerations. This change results in the Company reporting higher revenue and higher cost of revenue when these sales are reported on a gross basis, although the gross margin dollars do not change. Furthermore, for arrangements that include customer-specified acceptance criteria, revenue is recognized when the Company can objectively determine that control has been transferred to the customer in accordance with the agreed-upon specifications in the contract, which may occur before formal customer acceptance. This change primarily impacts revenue recognition for arrangements in the logistics industry where certain customer solutions include installed ID products and results in earlier recognition of revenue.

The adoption of the standard impacted our previously-reported results as follows (in thousands):

Statement of Operations

	Year Ended December 31, 2017		
	As previously reported	Adjustment	As restated
Revenue	\$747,950	\$ 18,133	\$766,083
Cost of revenue	168,698	18,591	187,289
Gross margin	579,252	(458)	578,794
Operating income	259,319	(458)	258,861
Income before income tax expense	266,922	(458)	266,464
Income tax expense (benefit)	89,744	8	89,752
Net income	\$177,178	\$ (466)	\$176,712

Net income per weighted-average common and common-equivalent share:

Basic	\$1.02	\$ —	\$1.02
Diluted	\$0.99	\$ (0.01)	\$0.98

Statement of Operations

	Year Ended December 31, 2016		
	As previously reported	Adjustment	As restated
Revenue	\$520,753	\$ 8,762	\$529,515
Cost of revenue	115,590	15,480	131,070
Gross margin	405,163	(6,718)	398,445
Operating income	160,784	(6,718)	154,066
Income before income tax expense	168,795	(6,718)	162,077
Income tax expense (benefit)	18,968	(840)	18,128

Net income \$ 149,572 \$ (5,878) \$ 143,694

Net income per weighted-average common
and common-equivalent share:

Basic	\$0.88	\$ (0.04)	\$0.84
Diluted	\$0.86	\$ (0.03)	\$0.83

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Balance Sheet

	December 31, 2017		
	As previously reported	Adjustment	As restated
Prepaid expenses and other current assets	\$30,800	\$ (117)	\$30,683
Accrued income taxes	11,391	112	11,503
Deferred revenue and customer deposits	9,969	(549)	9,420
Retained earnings	668,267	320	668,587

Statement of Shareholders' Equity

	December 31, 2016		
	As previously reported	Adjustment	As restated
Retained Earnings	\$643,836	\$ 786	\$644,622

Statement of Shareholders' Equity

	December 31, 2015		
	As previously reported	Adjustment	As restated
Retained Earnings	\$566,622	\$ 6,664	\$573,286

The following table summarizes disaggregated revenue information by geographic area based upon the customer's country of domicile (in thousands):

	Year Ended December 31,		
	2018	2017	2016
Americas	\$267,043	\$214,338	162,359
Europe	307,965	328,826	230,311
Greater China	126,109	108,738	66,179
Other Asia	105,221	114,181	70,666
	\$806,338	\$766,083	\$529,515

The following table summarizes disaggregated revenue information by revenue type (in thousands):

	Year Ended December 31,		
	2018	2017	2016
Standard products and services	\$654,509	\$603,196	\$413,425
Application-specific customer solutions	151,829	162,887	116,090
	\$806,338	\$766,083	\$529,515

Costs to Fulfill a Contract

Costs to fulfill a contract are included in "Prepaid expenses and other current assets" on the Consolidated Balance Sheet and amounted to \$3,514,000 and \$3,230,000 as of December 31, 2018 and 2017, respectively.

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Accounts Receivable, Contract Assets, and Contract Liabilities

Accounts receivable represent amounts billed and currently due from customers which are reported at their net estimated realizable value. The Company maintains reserves against its accounts receivable for potential credit losses. Credit losses recognized on accounts receivable were immaterial for the year ended December 31, 2018 and 2017. Contract assets consist of unbilled revenue which arises when revenue is recognized in advance of billing for certain application-specific customer solutions contracts. Contract liabilities consist of deferred revenue and customer deposits which arise when amounts are billed to or collected from customers in advance of revenue recognition.

The following table summarizes the deferred revenue and customer deposits activity (in thousands):

	Amount
Balance as of December 31, 2016	\$7,078
Increases to deferred revenue and customer deposits	24,985
Recognition of revenue	(23,195)
Foreign exchange rate changes	552
Balance as of December 31, 2017	\$9,420
Increases to deferred revenue and customer deposits	63,231
Recognition of revenue	(61,819)
Foreign exchange rate changes	(987)
Balance as of December 31, 2018	\$9,845

As a practical expedient, the Company has elected not to disclose the aggregate amount of the transaction price allocated to unsatisfied performance obligations, as our contracts have an original expected duration of less than one year.

NOTE 14: Shareholders' Equity

Preferred Stock

The Company has 400,000 shares of authorized but unissued \$.01 par value preferred stock.

Common Stock

On April 25, 2018, the Company's shareholders approved an amendment to the Company's Articles of Organization to increase the authorized number of shares of common stock from 200,000,000 to 300,000,000. In addition, on April 25, 2018, the Company's shareholders approved an amendment and restatement of the Company's 2001 General Stock Option Plan which provides for an increase in the number of available shares by 10,000,000.

In October 2017, the Company's Board of Directors declared a two-for-one stock split, effected in the form of a stock dividend, on the shares of the Company's common stock. Each shareholder of record on November 17, 2017 received an additional share of common stock for each share of common stock then held. The stock was distributed on December 1, 2017. The Company retained the current par value of \$.002 per share for all shares of common stock. All references in the financial statements to the number of shares outstanding, number of shares repurchased, per-share amounts, and stock option data related to the Company's common stock have been adjusted to reflect the effect of the stock split for all periods presented. Shareholders' equity reflects the stock split by reclassifying from "Additional paid in capital" and "Retained earnings" to "Common stock" an amount equal to the par value of the additional shares arising from the split.

Each outstanding share of common stock entitles the record holder to one vote on all matters submitted to a vote of the Company's shareholders. Common shareholders are also entitled to dividends when and if declared by the Company's Board of Directors.

Shareholder Rights Agreement

On December 4, 2008, the Company adopted a Shareholder Rights Agreement to provide shareholders with the opportunity to benefit from the long-term prospects and value of the Company and to ensure that shareholders receive fair and equal treatment in the event of any proposed takeover of the Company. The Shareholder Rights Agreement,

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which was previously filed by the Company with the Securities and Exchange Commission as an exhibit to the Registration Statement on Form 8-A filed on December 5, 2008, could have made it more difficult for a third party to acquire, or could have discouraged a third party from acquiring, the Company or a large block of the Company's common stock. The Company determined to allow the Shareholder Rights Agreement and associated rights to expire in accordance with their terms on December 5, 2018 without renewal.

Stock Repurchases

In April 2017, the Company's Board of Directors authorized the repurchase of \$100,000,000 of the Company's common stock. The Company repurchased 1,744,000 shares at a cost of \$100,000,000 under this program, including 803,000 shares at a cost of \$45,200,000 in the first quarter of 2018. In February 2018, the Company's Board of Directors authorized the repurchase of \$150,000,000 of the Company's common stock. The Company repurchased 3,174,000 shares at a cost of \$150,000,000 under this program. In October 2018, the Company's Board of Directors authorized the repurchase of \$200,000,000 of the Company's common stock. As of December 31, 2018, the Company repurchased 203,000 shares at a cost of \$8,622,000 under this program, leaving a remaining balance of \$191,378,000. Total stock repurchases in 2018 amounted to \$203,822,000. The Company may repurchase shares under this program in future periods depending on a variety of factors, including, among other things, the impact of dilution from employee stock options, stock price, share availability, and cash requirements.

Dividends

The Company's Board of Directors declared and paid cash dividends of \$0.0375 per share in the first quarter of 2017, \$0.0425 in the second and third quarters of 2017, and \$0.0450 in the fourth quarter of 2017, as well as in the first, second, and third quarters of 2018. The dividend was increased to \$0.0500 in the fourth quarter of 2018. Total dividends amounted to \$31,865,000 and \$29,037,000 in 2018 and 2017, respectively. Future dividends will be declared at the discretion of the Company's Board of Directors and will depend upon such factors as the Board deems relevant, including, among other things, the Company's ability to generate positive cash flow from operations.

NOTE 15: Stock-Based Compensation**Stock Option Plans**

The Company's share-based payments that result in compensation expense consist of stock option grants and restricted stock awards. As of December 31, 2018, the Company had 19,578,752 shares available for grant. Stock options are granted with an exercise price equal to the market value of the Company's common stock at the grant date and generally vest over four or five years based upon continuous service and expire ten years from the grant date. Vesting of restricted stock awards may be based on continuing employment and/or achievement of pre-established performance goals and objectives. Vesting of performance-based restricted stock awards and time-based restricted stock awards must not be less than one year and three years, respectively; however, awards with time-based vesting may become vested incrementally over such three-year period.

The following table summarizes the Company's stock option activity:

	Shares (in thousands)	Weighted- Average Exercise Price	Weighted- Average Remaining Contractual Term (in years)	Aggregate Intrinsic Value (in thousands)
Outstanding as of December 31, 2017	12,726	\$ 25.24		
Granted	2,997	52.67		
Exercised	(1,493)	) 17.94		
Forfeited or expired	(441)	) 33.59		
Outstanding as of December 31, 2018	13,789	\$ 31.73	7.36	\$ 146,270
Exercisable as of December 31, 2018	4,556	\$ 20.94	5.85	\$ 82,716
	12,499	\$ 30.60	7.23	\$ 141,643

Options vested or expected to vest as of
December 31, 2018 (1)

(1) In addition to the vested options, the Company expects a portion of the unvested options to vest at some point in the future. Options expected to vest are calculated by applying an estimated forfeiture rate to the unvested options.

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The fair values of stock options granted in each period presented were estimated using the following weighted-average assumptions:

	Year Ended December 31,					
	2018		2017		2016	
Risk-free rate	2.9	%	2.4	%	1.7	%
Expected dividend yield	0.35	%	0.40	%	0.83	%
Expected volatility	39	%	41	%	41	%
Expected term (in years)	5.4		5.4		5.6	

Risk-free rate

The risk-free rate was based upon a treasury instrument whose term was consistent with the contractual term of the option.

Expected dividend yield

Generally, the current dividend yield is calculated by annualizing the cash dividend declared by the Company's Board of Directors and dividing that result by the closing stock price on the grant date.

Expected volatility

The expected volatility was based upon a combination of historical volatility of the Company's common stock over the contractual term of the option and implied volatility for traded options of the Company's stock.

Expected term

The expected term was derived from the binomial lattice model from the impact of events that trigger exercises over time.

The Company stratifies its employee population into two groups: one consisting of senior management and another consisting of all other employees. The Company currently applies an estimated forfeiture rate of 8% to all unvested options for senior management and a rate of 12% for all other employees. Each year during the first quarter, the Company revises its forfeiture rate. This resulted in an increase to compensation expense of \$1,283,000 in 2018, a decrease to compensation expense of \$673,000 in 2017, and an increase to compensation expense of \$334,000 in 2016.

The weighted-average grant-date fair value of stock options granted was \$20.84 in 2018, \$15.59 in 2017, and \$6.33 in 2016.

The total intrinsic value of stock options exercised was \$52,629,000 in 2018, \$136,672,000 in 2017, and \$55,580,000 in 2016. The total fair value of stock options vested was \$31,106,000 in 2018, \$21,519,000 in 2017, and \$18,114,000 in 2016.

As of December 31, 2018, total unrecognized compensation expense related to non-vested stock options was \$49,229,000, which is expected to be recognized over a weighted-average period of 1.56 years.

The following table summarizes the Company's restricted stock activity:

	Shares (in thousands)	Weighted-Average Grant Fair Value	Aggregate Intrinsic Value (in thousands)
Nonvested as of December 31, 2017	20	\$ 17.03	
Granted	—	—	
Vested	(20)	17.03	993
Forfeited or expired	—	—	
Nonvested as of December 31, 2018	—	\$ —	\$ —

The fair values of restricted stock awards granted were determined based upon the market value of the Company's common stock at the time of grant. The initial cost is then amortized over the period of vesting until the restrictions lapse. These restricted shares were fully vested in 2018. Participants are entitled to dividends on restricted stock

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awards, but only receive those amounts if the shares vest. The sale or transfer of these shares is restricted during the vesting period.

The total stock-based compensation expense and the related income tax benefit recognized was \$41,090,000 and \$7,317,000, respectively, in 2018, \$31,942,000 and \$10,473,000, respectively, in 2017, and \$20,558,000 and \$6,747,000, respectively, in 2016. No compensation expense was capitalized in 2018, 2017, or 2016.

The following table presents the stock-based compensation expense by caption for each period presented on the Consolidated Statements of Operations (in thousands):

	Year Ended December 31,		
	2018	2017	2016
Cost of revenue	\$2,447	\$1,881	\$1,052
Research, development, and engineering	14,578	11,022	6,271
Selling, general, and administrative	24,065	19,039	13,235
	\$41,090	\$31,942	\$20,558

NOTE 16: Employee Savings Plan

For the first ten months of 2018, under the Company's Employee Savings Plan, a defined contribution plan, U.S. employees, who had attained age 21 and were not defined as highly compensated, could have contributed up to 50% of their pay on a pre-tax basis subject to the annual dollar limitations established by the Internal Revenue Service (IRS). Highly compensated employees as defined by the IRS, could have contributed up to 25% of their pay on a pre-tax basis. The Company matched 50% of the first 6% of pay an employee contributed. Company contributions vested 20%, 40%, 60%, and 100% after two, three, four, and five years of continuous employment with the Company, respectively.

On November 1, 2018, the Company changed the custodian of the Employee Savings Plan which altered the contribution rate and vesting period. Commencing on that date, all U.S. employees, whether they are determined to be highly compensated or not, who have attained age 21 may contribute up to 100% of their pay on a pre-tax basis under the Company's Employee Savings Plan. The Company still matches 50% of the first 6% of pay an employee contributes. Company contributions vest 25%, 50%, 75%, and 100% after one, two, three, and four years of continuous employment with the Company, respectively. Company contributions totaled \$2,540,000 in 2018, \$2,030,000 in 2017, and \$1,712,000 in 2016. Cognex stock is not an investment alternative and Company contributions are not made in the form of Cognex stock.

NOTE 17: Taxes

Domestic income from continuing operations before taxes was \$39,042,000 in 2018, \$30,345,000 in 2017, and \$23,939,000 in 2016. Foreign income from continuing operations before taxes was \$195,532,000 in 2018, \$236,119,000 in 2017, and \$138,138,000 in 2016.

Income tax expense on continuing operations consisted of the following (in thousands):

	Year Ended December 31,		
	2018	2017	2016
Current:			
Federal	\$10,624	\$78,152	\$14,459
State	(879)	2,687	(617)
Foreign	6,307	7,624	7,309
	16,052	88,463	21,151
Deferred:			
Federal	(1,271)	1,569	(3,031)
State	554	(639)	1,066
Foreign	(28)	359	(1,058)
	(745)	1,289	(3,023)
	\$15,307	\$89,752	\$18,128

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A reconciliation of the U.S. federal statutory corporate tax rate to the Company's income tax expense on continuing operations, or effective tax rate, was as follows:

	Year Ended December 31,					
	2018		2017		2016	
Income tax expense at U.S. federal statutory corporate tax rate	21	%	35	%	35	%
State income taxes, net of federal benefit	1		—		1	
Foreign tax rate differential	(9	)	(27	)	(17)
Tax credit	—		(1	)	(1)
Discrete tax benefit related to employee stock option exercises	(4	)	(14	)	(7)
Discrete tax expense (benefit) related to 2017 Tax Act	(3	)	36		—	
Discrete tax expense related to write-down of deferred tax assets	—		5		—	
Other discrete tax events	—		(1)	—	
Other	1		1		—	
Income tax expense on continuing operations	7	%	34	%	11	%

The Tax Act

On December 22, 2017, the Tax Cuts and Jobs Act of 2017 (Tax Act) was signed into law. The Tax Act resulted in a decrease in the U.S. federal statutory corporate tax rate from 35% to 21%. As a result of the reduction in anticipated tax rate, the Company remeasured its deferred tax positions as of December 31, 2017 at the new enacted tax rate, and accordingly, recorded tax expense of \$12,523,000 in 2017 from the associated write-down of its deferred tax assets. In 2018, the Company recorded an increase in tax expense of \$3,240,000 from the write-down of its deferred tax assets primarily relating to guidance under the Tax Act regarding stock-based compensation.

The Tax Act subjects unrepatriated foreign earnings to a one-time transition tax, regardless of the Company's financial statement assertion related to indefinite reinvestment or whether the Company ultimately repatriates any of the foreign earnings, for which the Company recorded estimated tax expense of \$101,379,000 in 2017. In 2018, the Company revised its estimate of the one-time transition tax and recorded a decrease in tax expense of \$11,028,000, which resulted in a revised estimate for the one-time transition tax of \$90,351,000 payable over eight years.

The Tax Act replaces the current system of taxing U.S. corporations on repatriated foreign earnings with a partial territorial system that provides a 100% dividends-received deduction to domestic corporations for foreign-source dividends received from 10% or more owned foreign corporations. The Company recorded a decrease in tax expense of \$3,843,000 in 2017 from the reversal of the tax effect of a 2016 dividend paid in 2017 from a wholly-owned foreign subsidiary to its domestic entity.

The Company will continue to gather and analyze information on historical unrepatriated foreign earnings and monitor state laws relating to this income to finalize both the federal and state tax impact. The Tax Act limits certain deductions and these limitations may impact the value of existing deferred tax assets. The Company will continue to review the impact of these limitations as regulatory guidance is issued.

Other Discrete Tax Items

The effective tax rate also included a decrease in tax expense of \$8,488,000 in 2018, \$38,569,000 in 2017, and \$11,889,000 in 2016 from the excess tax benefit arising from the difference between the deduction for tax purposes and the compensation cost recognized for financial reporting purposes from stock option exercises. The Company cannot predict the level of stock option exercises by employees in future periods.

In 2018, tax expense included a provision for state income taxes of \$620,000 from a change in management's financial statement assertion related to the indefinite reinvestment of foreign earnings. Management has determined that earnings from its legal entity in China will remain indefinitely reinvested to provide sufficient local funding for growth, and that earnings from all other jurisdictions will not be indefinitely reinvested resulting in the additional state income tax provision. As of December 31, 2018 and 2017, \$446,346,000 and \$498,653,000, respectively, of the Company's cash, cash equivalents, and investments were held by foreign subsidiaries and were primarily denominated in U.S. Dollars.

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Other discrete tax events resulted in a net decrease in tax expense of \$2,467,000 in 2018 and a net decrease in tax expense of \$2,502,000 in 2017, consisting primarily of i) the final true-up of the prior year's tax accrual upon filing the related tax returns and ii) the expiration of the statutes of limitations for certain reserves for income tax uncertainties. The Company is tax resident in numerous jurisdictions around the world and has identified its major tax jurisdictions as the United States, Ireland, and China. The statutory tax rate is 12.5% in Ireland and 25% in China, compared to the U.S. federal statutory corporate tax rate of 21%. International rights to certain of the Company's intellectual property are held by a subsidiary whose legal jurisdiction does not tax this income, resulting in a foreign effective tax rate lower than the above mentioned statutory rates.

Interest and penalties included in income tax expense was \$91,000, \$71,000, and \$92,000 in 2018, 2017, and 2016, respectively.

On January 1, 2018, the Company adopted Accounting Standard Update (ASU) 2016-16, "Income Taxes - Intra-Entity Transfers of Assets Other than Inventory." This ASU requires the recognition of deferred income taxes for an intra-entity transfer of an asset other than inventory. As a result of this ASU, the Company recorded \$5,961,000 through a cumulative-effect adjustment directly to retained earnings at the beginning of fiscal year 2018.

Tax Reserves

The changes in the reserve for income taxes, excluding gross interest and penalties, were as follows (in thousands):

Balance of reserve for income taxes as of December 31, 2016	\$5,719
Gross amounts of decreases in unrecognized tax benefits as a result of tax positions taken in prior periods	(56)
Gross amounts of increases in unrecognized tax benefits as a result of tax positions taken in the current period	1,993
Gross amounts of decreases in unrecognized tax benefits relating to settlements with taxing authorities	(116)
Gross amounts of decreases in unrecognized tax benefits as a result of the expiration of the applicable statutes of limitations	(791)
Balance of reserve for income taxes as of December 31, 2017	6,749
Gross amounts of increases in unrecognized tax benefits as a result of tax positions taken in prior periods	69
Gross amounts of increases in unrecognized tax benefits as a result of tax positions taken in the current period	1,499
Gross amounts of decreases in unrecognized tax benefits as a result of the expiration of the applicable statutes of limitations	(1,023)
Balance of reserve for income taxes as of December 31, 2018	\$7,294

The Company's reserve for income taxes, including gross interest and penalties, was \$8,134,000 as of December 31, 2018, which included \$7,106,000 classified as a non-current liability and \$1,028,000 recorded as a reduction to non-current deferred tax assets. The Company's reserve for income taxes, including gross interest and penalties, was \$7,516,000 as of December 31, 2017, which included \$6,488,000 classified as a non-current liability and \$1,028,000 recorded as a reduction to non-current deferred tax assets. The amount of gross interest and penalties included in these balances was \$840,000 and \$767,000 as of December 31, 2018 and December 31, 2017, respectively. If the Company's tax positions were sustained or the statutes of limitations related to certain positions expired, these reserves would be released and income tax expense would be reduced in a future period. As a result of the expiration of certain statutes of limitations, there is a potential that a portion of these reserves could be released, which would decrease income tax expense by approximately \$1,200,000 to \$1,300,000 over the next twelve months.

The Company has defined its major tax jurisdictions as the United States, Ireland, and China, and within the United States, Massachusetts. Within the United States, the tax years 2015 through 2018 remain open to examination by the Internal Revenue Service and various state taxing authorities. The tax years 2014 through 2018 remain open to examination by various taxing authorities in other jurisdictions in which the Company operates.

In 2011, the Company finalized an Advanced Pricing Agreement (APA) with Japan that covers tax years 2006 through 2011, with a requested extension to 2012. The Company has concluded negotiations for an APA between Japan and Ireland that covers tax years 2014 through 2018 with retroactive application to 2013. The Company is currently in negotiations to potentially extend this agreement through 2022. The Company believes it is adequately reserved for these open years.

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COGNEX CORPORATION - NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Deferred Tax Assets and Liabilities

Deferred tax assets and liabilities consisted of the following (in thousands):

	December 31,	
	2018	2017
Non-current deferred tax assets:		
Stock-based compensation expense	\$13,818	\$11,664
Federal and state tax credit carryforwards	7,395	6,707
Bonuses, commissions, and other compensation	5,470	5,704
Inventory and revenue related	3,233	3,415
Depreciation	2,475	2,279
Other	2,425	3,012
Gross non-current deferred tax assets	34,816	32,781
Non-current deferred tax liabilities:		
Nondeductible intangible assets	(44)	(87)
Gross non-current deferred tax liabilities	(44)	(87)
Valuation allowance	(6,112)	(5,309)
Net non-current deferred tax assets	\$28,660	\$27,385

Non-current deferred tax liabilities:

Other	\$(962)	\$(312)
Net non-current deferred tax liabilities	\$(962)	\$(312)

In 2018, the Company recorded a valuation allowance of \$803,000 for state research and development tax credits that were not considered to be realizable. Should these credits be utilized in a future period, the reserve associated with these credits would be reversed in the period when it is determined that the credits can be utilized to offset future state income tax liabilities. In addition, the Company had \$8,423,000 of state research and development tax credit carryforwards, net of federal tax, as of December 31, 2018, which will begin to expire in 2019.

While the deferred tax assets, net of valuation allowance, are not assured of realization, management has evaluated the realizability of these deferred tax assets and has determined that it is more likely than not that these assets will be realized. In reaching this conclusion, we have evaluated certain relevant criteria including the Company's historical profitability, current projections of future profitability, and the lives of tax credits, net operating losses, and other carryforwards. Should the Company fail to generate sufficient pre-tax profits in future periods, we may be required to establish valuation allowances against these deferred tax assets, resulting in a charge to current operations in the period of determination.

Cash paid for income taxes totaled \$41,430,000 in 2018, \$11,802,000 in 2017, and \$20,748,000 in 2016.

NOTE 18: Weighted Average Shares

Weighted-average shares were calculated as follows (in thousands):

	Year Ended December 31,		
	2018	2017	2016
Basic weighted-average common shares outstanding	172,333	173,287	170,676
Effect of dilutive stock options	5,073	6,264	3,468
Diluted weighted-average common and common-equivalent shares outstanding	177,406	179,551	174,144

Stock options to purchase 2,650,164, 3,363,141, and 4,391,598 shares of common stock, on a weighted-average basis, were outstanding in 2018, 2017, and 2016, respectively, but were not included in the calculation of diluted net income per share because they were anti-dilutive.

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COGNEX CORPORATION - NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

NOTE 19: Segment and Geographic Information

The Company operates in one segment, machine vision technology. The Company's chief operating decision maker is the chief executive officer, who makes decisions to allocate resources and assesses performance at the corporate level. The Company offers a variety of machine vision products that have similar economic characteristics, have the same production processes, and are distributed by the same sales channels to the same types of customers.

The following table summarizes information about geographic areas (in thousands):

	United States	Europe	Greater China	Other	Total
Year Ended December 31, 2018					
Revenue	\$ 231,760	\$307,965	\$126,109	\$140,504	\$806,338
Long-lived assets	67,156	23,948	1,482	2,735	\$95,321
Year Ended December 31, 2017					
Revenue	\$ 180,248	\$328,826	\$108,738	\$148,271	\$766,083
Long-lived assets	53,983	22,437	1,594	2,525	\$80,539
Year Ended December 31, 2016					
Revenue	\$ 142,380	\$230,311	\$66,179	\$90,645	\$529,515
Long-lived assets	40,404	12,981	994	1,932	\$56,311

Revenue is presented geographically based upon the customer's country of domicile. Revenue from a single customer accounted for 15%, 20%, and 17% of total revenue in 2018, 2017, and 2016, respectively. Accounts receivable from the same customer accounted for 30%, 40%, and 10% of total accounts receivable as of December 31, 2018, 2017, and 2016, respectively.

NOTE 20: Discontinued Operations

On July 6, 2015, the Company completed the sale of its Surface Inspection Systems Division (SISD) to AMETEK, Inc. (AMETEK). A binding arbitration was concluded in 2016 with respect to certain product performance claims made by an SISD customer, for which the Company remained responsible under the indemnity provisions of the sale transaction. In that proceeding, the tribunal ordered the Company to pay the customer approximately \$326,000, primarily representing a refund of the product purchase price. The tribunal also ordered the customer to pay the Company approximately \$45,000, primarily representing reimbursement of legal fees. The net settlement of \$281,000 was recorded in discontinued operations in 2016, along with \$123,000 of legal fees. The tax benefit related to this expense was \$149,000, resulting in a net loss from discontinued operations of \$255,000.

NOTE 21: Acquisitions

The Company completed a total of six business acquisitions in 2017 and 2016. All of these transactions were accounted for as business combinations. Pro-forma information for these acquisitions is not presented because they are not significant, either individually or in the aggregate. Revenue and earnings since the dates of the acquisitions included in the Company's Consolidated Statements of Operations are also not presented because they are not material. Transaction costs were immaterial and were expensed as incurred.

Assets acquired and liabilities assumed have been recorded at their estimated fair values as of the acquisition date. Contingent consideration is remeasured each reporting period with changes in fair value recorded in "Other income (expense)" on the Consolidated Statements of Operations.

GVi Ventures, Inc.

On April 12, 2017, the Company acquired selected assets and assumed selected liabilities of GVi Ventures, Inc., a privately-held maker of pre-configured vision solutions for common automotive applications based in the United States. The total purchase price of \$5,368,000 included cash payment of \$4,069,000 and contingent consideration valued at \$1,299,000 as of the acquisition date. In addition, the Company entered into special incentive payments tied to employment, none of which are material, that are being recorded as compensation expense.

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In 2017, the Company recorded a \$282,000 expense representing a fair value adjustment in other expense, which increased the liability amount to \$1,581,000 as of December 31, 2017. In 2018, the Company paid \$1,000,000 and recorded a \$1,065,000 expense representing a fair value adjustment in other expense, which increased the liability amount to \$1,646,000 as of December 31, 2018. The undiscounted potential outcomes related to future contingent consideration range from \$0 to \$2,500,000 based upon certain revenue levels over the next four years.

Under this transaction, in addition to customer relationships and completed technologies, the Company acquired a team of software engineers that are expected to develop new products and increase the Company's ability to serve large customers in the automotive industry.

The purchase price was allocated as follows (in thousands):

Accounts receivable	\$423
Inventories	120
Prepaid expenses and other current assets	1
Accounts payable	(152)
Accrued expenses	(10)
Completed technologies	910
Customer relationships	2,600
Goodwill	1,476
Purchase price	\$5,368

The customer relationships and completed technologies are included in "Intangible assets" on the Consolidated Balance Sheet. The customer relationships are being amortized to selling, general, and administrative expenses over eight years, and the completed technologies are being amortized to cost of revenue over five years, both on a straight-line basis. The portion of the acquired goodwill deductible for tax purposes is \$443,000.

ViDi Systems S.A.

On April 4, 2017, the Company acquired all of the outstanding shares of ViDi Systems, S.A. (ViDi), a privately-held vision software company based in Switzerland. The total purchase price of \$23,015,000 included cash payment of \$20,019,000, with the remaining \$2,996,000 recorded as a holdback to secure potential claims under the agreement that was paid in 2018. In addition, the Company entered into a special incentive payment tied to employment, which is not material, that is being recorded as compensation expense.

Under this transaction, in addition to completed technologies, the Company acquired a team of software engineers that are expected to help the Company broaden the scope of applications that can be addressed with Cognex vision. ViDi's deep learning software solves complex applications that are too complicated and time-consuming to program and maintain with traditional machine vision rules-based algorithms. Using feedback, ViDi's software trains the system to distinguish between acceptable variations and defects.

The purchase price was allocated as follows (in thousands):

Cash	\$146
Accounts receivable	425
Prepaid expenses and other current assets	129
Property, plant, and equipment	40
Deferred income tax asset	620
Accounts payable	(98)
Accrued expenses	(716)
Deferred income tax liability	(1,008)
Non-compete agreement	370
Completed technologies	4,774
Goodwill	18,333
Purchase price	\$23,015

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The non-compete agreement and completed technology are included in "Intangible assets" on the Consolidated Balance Sheet. The non-compete agreement will be amortized to research, development and engineering expenses over three years, and the completed technology will be amortized to cost of revenue over six years, both on a straight-line basis. The portion of the acquired goodwill deductible for tax purposes is \$5,112,000.

Webscan, Inc.

On December 9, 2016, the Company acquired selected assets and assumed selected liabilities of Webscan, Inc., a privately-held U.S.-based ID provider of barcode verifiers. The total purchase price of \$3,176,000 included \$3,000,000 in cash paid upon closing and \$176,000 in cash paid in January 2017 as a working capital adjustment. There are no contingent payments. In addition, the Company entered into special incentive payments tied to employment, none of which are material, that are being recorded as compensation expense.

Under this transaction, in addition to customer relationships and completed technologies, the Company acquired a team of individuals including software engineers that are expected to help the Company accelerate the development of future ID products.

The purchase price was allocated as follows (in thousands):

Accounts receivable	\$504
Inventories	296
Prepaid expenses and other current assets	8
Customer relationships	680
Completed technologies	840
Goodwill	925
Accounts payable	(77)
Purchase price	\$3,176

The customer relationships and completed technologies are included in "Intangible assets" on the Consolidated Balance Sheet. The customer relationships are being amortized to selling, general, and administrative expenses on a straight-line basis over seven years, and the completed technologies are being amortized to cost of revenue on a straight-line basis over five years. The portion of the acquired goodwill deductible for tax purposes is \$287,000.

Chiaro Technologies LLC

On November 30, 2016, the Company acquired selected assets and assumed selected liabilities of Chiaro Technologies LLC, a privately-held U.S.-based 3D vision company. The total purchase price of \$4,149,000 included cash payment of \$3,538,000 and contingent consideration valued at \$611,000 as of the acquisition date. In addition, the Company entered into special incentive payments tied to employment, none of which are material, that are being recorded as compensation expense.

In 2017, the Company recorded a \$15,000 expense representing a fair value adjustment in other expense, which increased the liability amount to \$626,000 as of December 31, 2017. In 2018, the Company recorded a \$282,000 expense representing a fair value adjustment in other expense, which increased the liability amount to \$908,000 as of December 31, 2018. The undiscounted potential outcomes related to the contingent consideration range from \$0 to \$1,250,000 based upon certain milestone revenue levels to be met in 2019 and paid in early 2020.

Under this transaction, in addition to completed technologies, the Company acquired a team of software engineers that are expected to help the Company accelerate the development of future 3D vision products.

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The purchase price was allocated as follows (in thousands):

Prepaid expenses and other current assets	\$3
Completed technologies	1,350
Goodwill	2,911
Accrued expenses	(115)
Purchase price	\$4,149

The completed technologies are included in "Intangible assets" on the Consolidated Balance Sheet and are being amortized to cost of revenue on a straight-line basis over seven years. The portion of the acquired goodwill deductible for tax purposes is \$902,000.

EnShape GmbH

On October 27, 2016, the Company acquired all of the outstanding shares of EnShape GmbH, a privately-held 3D sensor provider based in Germany. The total purchase price of \$7,901,000 included \$5,395,000 in cash paid upon closing, \$1,362,000 of contingent cash payments based upon the completion of certain tasks that was paid in 2017, and \$1,144,000 of deferred cash payments as a holdback for potential indemnification claims that was paid in 2018. The Company also entered into special incentive payments tied to employment, none of which are material, that are being recorded as compensation expense.

Under this transaction, in addition to customer relationships and completed technologies, the Company acquired a team of software engineers that are expected to help the Company accelerate the development of future 3D vision products.

The purchase price was allocated as follows (in thousands):

Cash	\$167
Accounts receivable	4
Inventories	79
Prepaid expenses and other current assets	1,896
Property, plant, and equipment	44
Customer relationships	447
Completed technologies	1,089
Goodwill	6,732
Accounts payable	(6)
Accrued expenses	(209)
Accrued income taxes	(2,342)
Purchase price	\$7,901

The customer relationships and completed technologies are included in "Intangible assets" on the Consolidated Balance Sheet. The customer relationships are being amortized to selling, general, and administrative expenses, and the completed technologies are being amortized to cost of revenue, both on a straight-line basis over seven years. The portion of the acquired goodwill deductible for tax purposes is \$328,000.

AQSense, S.L.

On August 30, 2016, the Company acquired selected assets and assumed selected liabilities of AQSense, S.L., a privately-held 3D vision software provider based in Spain. The total purchase price of \$2,519,000 was paid in cash and there are no contingent payments.

Under this transaction, in addition to customer relationships and completed technologies, the Company acquired a team of software engineers that are expected to help the Company accelerate the development of future 3D vision products.

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The purchase price was allocated as follows (in thousands):

Accounts receivable	\$168
Customer relationships	598
Completed technologies	384
Goodwill	1,383
Accrued expenses	(14)
Purchase price	\$2,519

The completed technologies are included in "Intangible assets" on the Consolidated Balance Sheet and they are being amortized to cost of revenue on a straight-line basis over five years. The acquired goodwill is not deductible for tax purposes.

In 2017, the Company determined that the carrying value of the customer relationships was impaired and reduced this value to zero. The impairment charge was included in selling, general, and administrative expenses on the Consolidated Statements of Operations.

NOTE 22: Subsequent Events

On February 14, 2019, the Company's Board of Directors declared a cash dividend of \$0.050 per share. The dividend is payable March 15, 2019 to all shareholders of record as of the close of business on March 1, 2019.

COGNEX CORPORATION - SELECTED QUARTERLY FINANCIAL DATA (UNAUDITED)

	Quarter Ended			
	April 1, 2018	July 1, 2018	September 30, 2018	December 31, 2018
	(In thousands, except per share amounts)			
Revenue	\$169,567	\$211,264	\$232,221	\$ 193,286
Gross margin	129,369	157,095	173,361	140,461
Operating income	34,596	63,455	77,844	45,247
Net income	\$37,217	\$56,196	\$80,436	\$ 45,418
Basic net income per share	\$0.21	\$0.33	\$0.47	\$ 0.26
Diluted net income per share	\$0.21	\$0.32	\$0.45	\$ 0.26
	Quarter Ended			
	April 2, 2017	July 2, 2017	October 1, 2017	December 31, 2017
	(In thousands, except per share amounts)			
Revenue	\$139,039	\$178,080	\$266,042	\$ 182,922
Gross margin	106,507	135,916	197,981	138,390
Operating income	37,216	60,021	110,849	50,775
Net income (loss)		\$45,471	\$56,495	\$ 102,493 \$ (27,747)
Basic net income (loss) per share (1)		\$0.26	\$0.33	\$0.59 \$ (0.16)
Diluted net income (loss) per share (1) (2)		\$0.25	\$0.32	\$0.57 \$ (0.16)

(1) Prior period results have been adjusted to reflect the two-for-one stock split effected in the form of a stock dividend which occurred in the quarter ended December 31, 2017.

(2) As a result of the net loss recorded for the quarter ended December 31, 2017, potential common stock equivalents of 7,145 were not included in the calculation of diluted net loss per share for this quarter.

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COGNEX CORPORATION – SCHEDULE II – VALUATION AND QUALIFYING ACCOUNTS

Description	Additions					Balance at End of Period
	Balance Beginning of Period (In thousands)	Charged Costs and Expenses	Charged to Other Accounts	Deductions	Other	
Reserve for Uncollectible Accounts Receivable and Sales Returns:						
2018	\$ 1,568	\$ 464	\$ —	—\$ (343)	(a) \$(43)(b)	\$ 1,646
2017	\$ 873	\$ 724	\$ —	—\$ (116)	(a) \$87 (b)	\$ 1,568
2016	\$ 736	\$ 216	\$ —	—\$ (64)	(a) \$(15)(b)	\$ 873
Deferred Tax Valuation Allowance:						
2018	\$ 5,309	\$ 803	\$ —	—\$ —	\$—	\$ 6,112
2017	\$ 4,116	\$ 1,193	\$ —	—\$ —	\$—	\$ 5,309
2016	\$ 3,259	\$ 857	\$ —	—\$ —	\$—	\$ 4,116
(a) Specific write-offs						
(b) Foreign currency exchange rate changes						

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

There were no disagreements with accountants on accounting or financial disclosure during 2018 or 2017.

ITEM 9A: CONTROLS AND PROCEDURES

Disclosure Controls and Procedures

As required by Rules 13a-15 and 15d-15 of the Securities Exchange Act of 1934, the Company has evaluated, with the participation of management, including the Chief Executive Officer and the Chief Financial Officer, the effectiveness of its disclosure controls and procedures (as defined in such rules) as of the end of the period covered by this report. Based on such evaluation, the Chief Executive Officer and Chief Financial Officer concluded that such disclosure controls and procedures were effective as of that date.

Management's Report on Internal Control over Financial Reporting

Management is responsible for establishing and maintaining adequate internal control over financial reporting. Management has evaluated the effectiveness of the Company's internal control over financial reporting based upon the framework in Internal Control – Integrated Framework issued in 2013 by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

Based upon our evaluation, management has concluded that the Company's internal control over financial reporting was effective as of December 31, 2018.

Attestation Report of the Registered Public Accounting Firm on Internal Control over Financial Reporting

The Company's internal control over financial reporting as of December 31, 2018 has been audited by Grant Thornton LLP, an independent registered public accounting firm, as stated in their report which is included herein.

Changes in Internal Control over Financial Reporting

During the third quarter of 2018, the Company implemented a new Enterprise Resource Planning (ERP) system. As a result of this implementation, the Company modified certain existing internal controls as well as implemented new controls and procedures related to the new ERP system. The Company continued to evaluate the design and operating effectiveness of these internal controls during the fourth quarter of 2018. Except with respect to the continued implementation of the ERP system, there were no changes in the Company's internal control over financial reporting that occurred during the quarter ended December 31, 2018 that have materially affected, or are reasonably likely to materially affect, the Company's internal control over financial reporting. The Company continues to review its disclosure controls and procedures, including its internal control over financial reporting, and may from time to time make changes aimed at enhancing their effectiveness and to ensure that the Company's systems evolve with its business.

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REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

Board of Directors and Shareholders Cognex Corporation

Opinion on internal control over financial reporting

We have audited the internal control over financial reporting of Cognex Corporation (a Massachusetts 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 14, 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. 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.

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

Boston, Massachusetts

February 14, 2019

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ITEM 9B: OTHER INFORMATION

None

PART III

ITEM 10: DIRECTORS, EXECUTIVE OFFICERS, AND CORPORATE GOVERNANCE

Information with respect to Directors and Executive Officers of the Company and the other matters required by Item 10 shall be included in the Company's definitive Proxy Statement for the Annual Meeting of Shareholders to be held on April 25, 2019 and is incorporated herein by reference. In addition, certain information with respect to Executive Officers of the Company may be found in the section captioned "Executive Officers of the Registrant," appearing in Part I – Item 4A of this Annual Report on Form 10-K.

The Company has adopted a Code of Business Conduct and Ethics covering all employees, which is available, free of charge, on the Company's website, www.cognex.com under "Company-Investor Information-Governance". The Company intends to disclose on its website any amendments to or waivers of the Code of Business Conduct and Ethics on behalf of the Company's directors and executive officers that would otherwise be required to be disclosed under the rules of the SEC or The NASDAQ Stock Market LLC.

ITEM 11: EXECUTIVE COMPENSATION

Information with respect to executive compensation and the other matters required by Item 11 shall be included in the Company's definitive Proxy Statement for the Annual Meeting of Shareholders to be held on April 25, 2019 and is incorporated herein by reference.

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

Information with respect to security ownership and the other matters required by Item 12 shall be included in the Company's definitive Proxy Statement for the Annual Meeting of Shareholders to be held on April 25, 2019 and is incorporated herein by reference.

The following table provides information as of December 31, 2018 regarding shares of common stock that may be issued under the Company's existing equity compensation plans:

Plan Category	Number of securities to be issued upon exercise of outstanding options, warrants, and rights		Weighted-average exercise price of outstanding options, warrants, and rights		Number of securities remaining available for future issuance under equity compensation plans (excluding securities reflected in column (a))	
	(a)	(1)	(2)	(3)	(4)	(5)
Equity compensation plans approved by shareholders (4)	13,446,631	(1)	\$ 32.3592	(2)	19,578,752	(3)
Equity compensation plans not approved by shareholders (4)	341,943	(3)	6.9819	(4)	—	(5)
	13,788,574		\$ 31.7298		19,578,752	

Includes shares to be issued upon exercise of outstanding options under the Company's 1998 Stock Incentive Plan, (1) 2007 Stock Option and Incentive Plan, and subsequent to shareholder approval, the 2001 General Stock Option Plan, as amended and restated.

(2) Includes shares remaining available for future issuance under the Company's 2007 Stock Option and Incentive Plan and 2001 General Stock Option Plan, as amended and restated.

(3) Includes shares to be issued upon the exercise of outstanding options granted prior to shareholder approval under the 2001 General Stock Option Plan, as amended and restated.

(4) All references made to share or per share amounts have been adjusted to reflect the two-for-one stock split which occurred in the fourth quarter of 2017.

The 2001 General Stock Option Plan was originally adopted by the Board of Directors in December 2001 without shareholder approval. In December 2011, this plan received shareholder approval for an amendment and restatement of the plan. This plan provides for the granting of nonqualified stock options and incentive stock options to any

employee who is actively employed by the Company and is not an officer or director of the Company. The maximum number of shares of common stock available for grant under this plan is 38,440,000 shares. All option grants must have an exercise price per share that is no less than the fair market value per share of the Company's common stock on the grant date and must have a term that is no longer than ten years from the grant date. 27,506,440 stock options have been granted under the 2001 General Stock Option Plan.

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

Information with respect to certain relationships and related transactions and the other matters required by Item 13 shall be included in the Company's definitive Proxy Statement for the Annual Meeting of Shareholders to be held on April 25, 2019 and is incorporated herein by reference.

ITEM 14: PRINCIPAL ACCOUNTING FEES AND SERVICES

Information with respect to principal accounting fees and services and the other matters required by Item 14 shall be included in the Company's definitive Proxy Statement for the Annual Meeting of Shareholders to be held on April 25, 2019 and is incorporated herein by reference.

PART IV

ITEM 15: EXHIBITS AND FINANCIAL STATEMENT SCHEDULES

(1) Financial Statements

The financial statements are included in Part II – Item 8 of this Annual Report on Form 10-K.

(2) Financial Statement Schedule

Financial Statement Schedule II is included in Part II – Item 8 of this Annual Report on Form 10-K.

Other schedules are omitted because of the absence of conditions under which they are required or because the required information is provided in the consolidated financial statements or notes thereto.

(3) Exhibits

The Exhibits filed as part of this Annual Report on Form 10-K are listed in the Exhibit Index, immediately preceding the signature page hereto.

ITEM 16: FORM 10-K SUMMARY

Not applicable

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EXHIBIT INDEX

EXHIBIT NUMBER

3A	<u>Restated Articles of Organization of Cognex Corporation effective June 27, 1989, as amended through May 5, 2016 (incorporated by reference to Exhibit 3.1 of Cognex's Quarterly Report on Form 10-Q for the quarter ended July 3, 2016 [File No. 1-34218])</u>
3B	<u>Articles of Amendment to the Articles of Organization of Cognex Corporation establishing Series E Junior Participating Preferred Stock (incorporated by reference to Exhibit 3.2 to Cognex's Quarterly Report on Form 10-Q for the quarter ended July 3, 2016 [File No. 1-34218])</u>
3C	<u>Articles of Amendment to Restated Articles of Organization of Cognex Corporation, effective May 2, 2018 (incorporated by reference to Exhibit 4.2 of Cognex's Registration Statement on Form S-8 [Registration No. 333-224716])</u>
3D	<u>By-laws of Cognex Corporation, as amended and restated through December 5, 2013 (incorporated by reference to Exhibit 3.3 of Cognex's Quarterly Report on Form 10-Q for the quarter ended July 3, 2016 [File No. 1-34218])</u>
3E	<u>Amendment to Amended and Restated By-laws of Cognex Corporation, effective May 5, 2016 (incorporated by reference to Exhibit 3.4 of Cognex's Quarterly Report on Form 10-Q for the quarter ended July 3, 2016 [File No. 1-34218])</u>
4A	<u>Specimen Certificate for Shares of Common Stock (incorporated by reference to Exhibit 4 to Cognex's Registration Statement on Form S-1 [Registration No. 33-29020])</u>
10A *	<u>Cognex Corporation 1998 Non-Employee Director Stock Option Plan (incorporated by reference to Exhibit 4.1 to Cognex's Registration Statement on Form S-8 [Registration No. 333-60807])</u>
10B *	<u>Amendment to Cognex Corporation 1998 Non-Employee Director Stock Option Plan, effective as of July 26, 2007 (incorporated by reference to Exhibit 10C of Cognex's Annual Report on Form 10-K for the year ended December 31, 2012 [File No. 1-34218])</u>
10C *	<u>Cognex Corporation 1998 Stock Incentive Plan (incorporated by reference to Exhibit 4.2 to the Registration Statement on Form S-8 [Registration No. 333-60807])</u>
10D *	<u>First Amendment to the Cognex Corporation 1998 Stock Incentive Plan (incorporated by reference to Exhibit 4.3 to Cognex's Registration Statement on Form S-8 [Registration No. 333-60807])</u>
10E *	<u>Second Amendment to the Cognex Corporation 1998 Stock Incentive Plan (incorporated by reference to Exhibit 10F of Cognex's Annual Report on Form 10-K for the year ended December 31, 2011 [File No. 1-34218])</u>
10F *	<u>Amendment to Cognex Corporation 1998 Stock Incentive Plan, effective as of July 26, 2007 (incorporated by reference to Exhibit 10G of Cognex's Annual Report on Form 10-K for the year ended December 31, 2012 [File No. 1-34218])</u>
10G *	<u>Cognex Corporation 2001 General Stock Option Plan, as amended and restated (incorporated by reference to Exhibit 99.1 to Cognex's Registration Statement on Form S-8 [Registration No. 333-224716])</u>
10H *	<u>Cognex Corporation 2007 Stock Option and Incentive Plan, as amended and restated (incorporated by reference to Exhibit 10H of Cognex's Annual Report on Form 10-K for the year ended December 31, 2017 [File No. 1-34218])</u>
10I *	<u>Form of Letter Agreement between Cognex Corporation and each of Robert J. Shillman, Patrick A. Alias and Anthony Sun (incorporated by reference to Exhibit 10K of Cognex's Annual Report on Form 10-K for the year ended December 31, 2012 [File No. 1-34218])</u>
10J *	<u>Form of Stock Option Agreement (Non-Qualified) under 1998 Stock Incentive Plan (incorporated by reference to Exhibit 10L of Cognex's Annual Report on Form 10-K for the year ended December 31, 2012 [File No. 1-34218])</u>

- 10K * Form of Indemnification Agreement with each of the Directors of Cognex Corporation (incorporated by reference to Exhibit 10R of Cognex's Annual Report on Form 10-K for the year ended December 31, 2013 [File No. 1-34218])
- 10L * Employment Agreement, dated June 17, 2008, by and between Cognex Corporation and Robert Willett (incorporated by reference to Exhibit 10S of Cognex's Annual Report on Form 10-K for the year ended December 31, 2013 [File No. 1-34218])
- 10M * Amendment to Employment Agreement with Robert Willett, dated November 14, 2008 (incorporated by reference to Exhibit 10T of Cognex's Annual Report on Form 10-K for the year ended December 31, 2013 [File No. 1-34218])

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10N Form of Stock Option Agreement (Non-Qualified) under 2007 Stock Option and Incentive Plan (incorporated by reference to Exhibit 10U of Cognex's Annual Report on Form 10-K for the year ended December 31, 2013 [File No. 1-34218])
*

10O Form of Stock Option Agreement under 2001 General Stock Option Plan (incorporated by reference to Exhibit 10O of Cognex's Annual Report on Form 10-K for the year ended December 31, 2017 [File No. 1-34218])
*

10P Stock Option Agreements with Robert Willett dated November 3, 2014 (incorporated by reference to Exhibit 10S of Cognex's Annual Report on Form 10-K for the year ended December 31, 2014 [File No. 1-34218])
*

10Q Summary of Cognex Annual Bonus Program (incorporated by reference to Exhibit 10Q of Cognex's Annual Report on Form 10-K for the year ended December 31, 2017 [File No. 1-34218])
*

10R Letter Agreement dated February 15, 2018 between Cognex Corporation and J. Bruce Robinson (incorporated by reference to Cognex's Quarterly Report on Form 10-Q for the quarter ended April 30, 2018 [File No. 1-34218])
*

21 Subsidiaries of the registrant (filed herewith)

23.1 Consent of Grant Thornton LLP (filed herewith)

31.1 Certification pursuant to Section 302 of the Sarbanes-Oxley Act of 2002 (CEO) (filed herewith)

31.2 Certification pursuant to Section 302 of the Sarbanes-Oxley Act of 2002 (CFO) (filed herewith)

32.1 Certification pursuant to Section 906 of the Sarbanes-Oxley Act of 2002 (CEO) (furnished herewith)

32.2 Certification pursuant to Section 906 of the Sarbanes-Oxley Act of 2002 (CFO) (furnished herewith)

101 xBRL (Extensible Business Reporting Language)
The following materials from Cognex Corporation's Annual Report on Form 10-K for the period ended December 31, 2018, formatted in xBRL: (i) Consolidated Statements of Operations for the years ended December 31, 2018, December 31, 2017, and December 31, 2016; (ii) Consolidated Statements of Comprehensive Income for the years ended December 31, 2018, December 31, 2017, and December 31, 2016; (iii) Consolidated Balance Sheets as of December 31, 2018 and December 31, 2017; (iv) Consolidated Statements of Cash Flows for the years ended December 31, 2018, December 31, 2017, and December 31, 2016; (v) Consolidated Statements of Shareholders' Equity for the years ended December 31, 2018, December 31, 2017, and December 31, 2016; and (vi) Notes to Consolidated Financial Statements.
* Indicates management contract or compensatory plan or arrangement

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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.

COGNEX CORPORATION

By: /s/ Robert J. Willett

Robert J. Willett

President and Chief Executive 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.

Signature	Title	Date
/s/ Robert J. Shillman Robert J. Shillman	Chairman of the Board of Directors and Chief Culture Officer	February 14, 2019
/s/ Robert J. Willett Robert J. Willett	President, Chief Executive Officer, and Director (principal executive officer)	February 14, 2019
/s/ John J. Curran John J. Curran	Senior Vice President of Finance and Chief Financial Officer (principal financial and accounting officer)	February 14, 2019
/s/ Patrick Alias Patrick Alias	Director	February 14, 2019
/s/ Eugene Banucci Eugene Banucci	Director	February 14, 2019
/s/ Theodor Krantz Theodor Krantz	Director	February 14, 2019
/s/ Dianne Parrotte Dianne Parrotte	Director	February 14, 2019
/s/ Jerry Schneider Jerry Schneider	Director	February 14, 2019
/s/ Anthony Sun Anthony Sun	Director	February 14, 2019

