ECHELON CORP
Form 10-K
March 27, 2018

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, DC 20549
FORM 10-K
(Mark One)

þ	ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the fiscal year ended December 31, 2017

OR

¨	TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the transition period from _____ to _____.

Commission file number: 000-29748
ECHELON CORPORATION
(Exact name of registrant as specified in its charter)

Delaware	77-0203595
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification Number)

2901 Patrick Henry Drive
Santa Clara, California 95054
(Address of principal executive office and zip code)
(408) 938-5200

(Registrant's telephone number,
including area code)

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Name of each exchange on which registered
Common Stock, par value $0.01	The NASDAQ Stock Market LLC
(The Nasdaq Global Market)	

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

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ¨ No x

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Exchange Act. Yes ¨ No x

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes x No ¨
Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). Yes x No ¨

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. x

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See the definitions of “large accelerated filer,” “accelerated filer” and “smaller reporting company” in Rule 12b-2 of the Exchange Act. (Check one):

Large accelerated filer	Accelerated filer	Non-accelerated filer	Smaller reporting company X
(do not check if a smaller reporting company)		Emerging growth company	

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ¨

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes ¨ No x

As of June 30, 2017, the last business day of the registrant's most recently completed second fiscal quarter, there were 4,453,811 shares of the registrant's common stock outstanding, and the aggregate market value of such shares held by non-affiliates of the registrant (based on the per share closing sale price of $5.16 of such shares on the Nasdaq Global Market on June 30, 2017) was approximately $16.9 million. Shares of the registrant's common stock held by each executive officer and director and by each entity that owns 5% or more of the registrant's outstanding common stock have been excluded in that such persons may be deemed to be affiliates. This determination of affiliate status is not necessarily a conclusive determination for other purposes.

As of February 28, 2018, 4,524,021 shares of the registrant's common stock, $0.01 par value per share, were issued and outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Document	Parts Into Which Incorporated
Proxy Statement for the 2018 Annual Meeting of Stockholders to be held May 17, 2018 (Proxy Statement)	Part III

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FORWARD-LOOKING INFORMATION

This report contains forward-looking statements within the meaning of the U.S. federal securities laws that involve risks and uncertainties. Certain statements contained in this report are not purely historical including, without limitation, statements regarding our expectations, beliefs, intentions, anticipations, commitments or strategies regarding the future, are forward-looking. These statements include those discussed in Item 7, Management's Discussion and Analysis of Financial Condition and Results of Operations, including "Critical Accounting Estimates," "Results of Operations," "Off-Balance-Sheet Arrangements and Other Critical Contractual Obligations," "Liquidity and Capital Resources," and "Recently Issued Accounting Standards," and elsewhere in this report.

In this report, the words "may," "could," "would," "might," "will," "should," "plan," " forecast," "anticipate," "believe," "expe "estimate," "predict," "potential," "continue," "future," "moving toward" or the negative of these terms or other similar expres also identify forward-looking statements. Our actual results could differ materially from those forward-looking statements contained in this report as a result of a number of risk factors including, but not limited to, those set forth in the section entitled "Risk Factors" and elsewhere in this report. You should carefully consider these risks, in addition to the other information in this report and in our other filings with the SEC. All forward-looking statements and reasons why results may differ included in this report are made as of the date of this report, and we assume no obligation to update any such forward-looking statement or reason why such results might differ.

PART I

ITEM 1. BUSINESS

General

Echelon was incorporated in California in 1988 and reincorporated in Delaware in 1989. With its Silicon Valley based global headquarters in Santa Clara, California, and regional sales offices throughout North America, Europe, and Asia, Echelon makes its products available throughout the world.

We are a pioneer in developing distributed intelligence, open-standard control networking platforms for Industrial Internet of Things ("IIoT") applications and delivering elements necessary to design, install, monitor and control highly reliable, scalable and secure communities of devices. Echelon's vision is one of low-cost monitoring and control technology in every industrial electrical device in the world and complete vertical solutions in the fastest growing market segments. With more than 140 million Echelon-powered devices shipped worldwide, Echelon helps its customers migrate existing legacy devices, and bring new devices and applications into a growing global Industrial Internet.

In 2014 the Internet of Things ("IoT") market opportunity became increasingly apparent. The IoT refers to a network of physical objects, each containing a unique network address, which interact with each other to share information and to take action. IoT networks can run a variety of languages, or protocols, and be connected via wired or wireless links. The IoT can be further segmented into the Human Internet of Things (HIoT) and the Industrial Internet of Things (IIoT); the latter is Echelon's market focus.

The IIoT refers to communities of rules-based, self-directed devices that reside in commercial or industrial environments and operate with little to no human interaction. Because of the harsh nature of these environments (e.g., extreme temperature, vibration, noise, humidity, dust) where connectivity can be intermittent, and because industrial applications demand high reliability, IIoT devices need to be more robust than consumer-oriented HIoT devices. Specialized requirements of the IIoT include no-compromise control capability, proven reliability, and hardened security. In addition, IIoT devices must be able to interact autonomously and function when disconnected from the Internet or a local access point. The IIoT will incorporate decades of existing and in-service infrastructure - deployed mechanical and digital vertical solutions ready to be connected. When these solutions are connected, they generally communicate with protocols developed many years ago, and often dedicated to specific applications.

Just as mainframe networking evolved to workgroup networking, which gave way to the corporate and consumer Internet, the IIoT represents a next big wave in technology. This market opportunity is driven by the convergence of control systems for lighting, HVAC, security, manufacturing, transportation, and more. The customers for IIoT products are themselves participating in highly fluid and competitive environments that prize lower costs, differentiated offerings,

improved customer service, ubiquitous connectivity, and near-infinite analytic capabilities. The IIoT will unlock improvements in life quality, efficiency, safety, and more. Market analysts, such as those at IHS, Inc., project that the world market for Internet-connected devices could reach 50 billion by 2025, with the industrial segment representing the majority share of these devices.

IIoT products have long lifecycles and must operate under extreme conditions. They must also be secure to prevent unauthorized access and abuse that could cause environmental hazards or life-threatening situations. New systems running modern Information Technology protocols, such as IP, must interoperate with systems running mature Operational Technology protocols such as LONWORKS, BacNet and Modbus. Echelon's control networking technology is purpose-built for industrial environments such as building automation, lighting and transportation.

Strategy

Today Echelon has two areas of business focus. Our original product lines are focused on developing, marketing, selling and supporting embedded components, modules, edge servers, and software that enable OEMs and other 3rd parties to quickly develop IIoT devices for their end users. Applications span a broad range of markets and products from HVAC systems to manufacturing equipment control, elevator control, transportation, and much more.

Starting in late 2014, through the acquisition of Lumewave Inc., a wireless outdoor lighting control system provider with a track record of selling its solution to U.S. municipalities, universities, medical facilities and enterprises, we began developing and introducing a connected lighting platform geared primarily for outdoor applications. Targeting the fast-growing market for LED light sources, our Lumewave by Echelon connected lighting solution supports a range of applications for smart cities and smart enterprises. These applications can reduce energy consumption, enhance citizen and employee safety, improve livability in cities and make maintenance dollars go farther.

The Lumewave by Echelon products, which include individual lighting controllers, motion sensors, edge servers, and management and maintenance software, have since been incorporated into Echelon's product portfolio along with the established Lumewave sales channels in North America.

Embedded Components & Modules

Our IIoT embedded components and modules are utilized by a wide array of original equipment manufacturers (OEMs) and system integrators covering a broad spectrum of markets. Among the more significant of these markets are building automation systems, industrial and manufacturing equipment, lighting, and energy management systems. Sales levels track closely with new construction starts and tenant improvement cycles in the commercial buildings market. Consequently, industrial and manufacturing equipment is upgraded infrequently - approximately every 10 years or so. As with other areas of the IoT, numerous technical transitions are taking place that are impacting the market and our business. Most notably, legacy systems are becoming connected to the Internet so that 'big data analytics' can be performed and operational systems optimized in near real time. In addition, legacy 'operational technologies' such as RS485, BacNet and LonWorks are being augmented and in some cases supplanted by newer technologies such as Ethernet, Wi-Fi, Bluetooth, and TCP/IP. Standards are very much in flux which can slow the adoption of these new connectivity technologies.

In keeping with these trends, in October 2013, we introduced our IzoT™ embedded platform - purpose-built for the IIoT. The IzoT platform allows control networking to be done using Internet Protocol ("IP") all the way to the end device. IzoT software can run on any processor in an environment providing UDP/IP socket connectivity; it allows a single device to be brought to market as a LONWORKS®, BACnet®, or other protocol-supporting device; and it can be used with an underlying wired or wireless communications link, such as Ethernet, RS-485, Wi-Fi, 15.4, or Echelon's free topology (FT) standard. The IzoT platform allows customers to easily embrace their current installed solutions, extend those solutions with newer technologies if they choose, and enhance both existing and new

connectivity systems with cloud-based analytics. In June 2014 Echelon began sampling the IzoT platform with evaluation kits, software, chips, modules, and routers.

Both LONWORKS and the IzoT control networking platform consist of a three-tier architecture: a device tier, an edge server tier, and an enterprise software tier. At the device tier, industrial devices such as load controllers, lighting ballasts, meters, and thermostats, embed Echelon or third-party free topology (FT) or power line (PL) smart transceivers, enabling them to act as peers working together to collect data and take cooperative action. These individual devices are managed by edge servers, such as Echelon's Smart Servers. For example, when an edge server receives information from the local utility, such as a signal to shed electrical load, this information is transmitted across the twisted-pair network. The network

devices then execute the control signal, resulting in a reduction of energy consumption while preserving a safe and comfortable work environment.

At the edge server tier, various control technologies and protocols are unified and supervised so that local decisions can be made at the device tier levels. An example of an edge server is the Echelon SmartServer. In general, the devices and control node tiers communicate using control protocols such as LONWORKS technology (ISO/EN 14908), BACnet, and Open Smart Grid Protocol (OSGP). OSGP is a family of standards published by the European Telecommunications Standards Institute (ETSI) that is optimized for smart grid applications used in conjunction with LONWORKS technology.

At the enterprise software tier, Echelon technology connects the edge server tiers to an enterprise software tier, commonly an information technology (IT) solution, so business rules can be established for the control system and operational data can be archived for later analysis. Our LONWORKS Control Network Software (LNS) is an example of an enterprise software tier product. Edge servers communicate with enterprise tier solutions using Internet protocols such as TCP/IP and web services.

Lumewave by Echelon Connected Lighting Platform

Lighting, especially outdoor lighting, has been a key application for Echelon products and has been identified as potentially being one of the fastest growing market segments in the IIoT. Street, campus and commercial outdoor lights are important assets, providing safety and aesthetic value to their community. They also consume a significant amount of electricity - as much as 40% of a city's overall electricity budget. As a result, cities, campuses and commercial enterprises are responsible for a substantial portion of worldwide energy consumption and greenhouse gas production. Therefore, these entities are looking for ways to improve infrastructure to become more environmentally friendly, increase the quality of life for their residents and occupants, and reduce costs.

Market research suggests that the transition from ‘analog’ to ‘solid state’ lighting is happening at an accelerating pace. In 2015, 19% of outdoor lights used LED light sources, which is expected to increase to 79% by 2025 according to the United States Department of Energy.

The Lumewave by Echelon connected lighting platform is a multi-application solution. The growing list of applications that Lumewave supports bring benefits in the areas of energy savings and sustainability, safety enhancement, livability and improved maintenance efficiencies. Example applications in each area include:

- Sustainability/Energy savings. At the most basic level, Echelon's platform offers scheduling of lights on or off, the setting of dimming levels for individual or groups of lights, and intelligent lighting according to time of day, season, or weather conditions. Our systems include energy metering functions which allow a city to consider energy cost when optimizing system variables, and work with local utilities to minimize electricity charges
- Safety. With our system lamp outages can be quickly spotted and repaired, and often predicted and repaired before they fail. Our adaptive lighting solutions can brighten lights in response to motion, direction of travel, traffic volumes and more. Our new white tuning concept allows cities to control the color of outdoor lights from soothing yellow to bright blue/white depending upon comfort and safety requirements. Our weather adaptive lighting concept adjusts schedules, brightness and color temperature based on weather conditions for optimal safety.
- Livability. Selective dimming, adaptive lighting, white tuning and fault identification all help ensure a more livable and attractive city, which is good for business and good for the citizenry.
- Maintenance efficiency. Our platform is fixture-agnostic so our customers are free to choose and connect virtually any light fixture from any catalog. We have both RF and powerline communication options to maximize aesthetics and performance. The platform allows for GPS options, automated topology optimization, and includes a powerful Central Management System (CMS) configuration and management features to make startup commissioning and management easy. Powerful reporting helps optimize and predict maintenance needs, monitor energy consumption and identify

communication problems. Separate ‘application widgets’ support the needs of the specific applications described above.

Echelon’s outdoor lighting control product portfolio includes:

- Smart Transceivers: Outdoor lighting manufacturers can embed our power line smart transceivers into their outdoor light ballasts, drivers, and generators; or can use these transceivers to develop outdoor lighting controllers that serve as add-on products for existing dimmable ballasts and drivers within a luminaire. These components

enable command, control, and monitoring of each light. They communicate with the Echelon SmartServer edge server over existing power lines.

- Outdoor Lighting Controllers: In order to address the retrofit market and to reduce the time needed to develop and deploy intelligent luminaires, Echelon provides its own brand of outdoor lighting controllers. Echelon outdoor lighting controllers support RF and power line (PL) based communications.
- Motion Sensors: Echelon motion sensors work with outdoor lighting controllers to adjust light levels based on motion (ON/OFF or dimming).
- SmartServer Edge Server: The Echelon SmartServer is a programmable gateway for connecting outdoor lighting segments to a centralized management system. The SmartServer provides rules for operation, invoking on/off time and sequencing, dimming time and percentage, and other functions.
- PL/RF Bridge: Our PL/RF Bridge can be used to connect segments (groups) of outdoor lights to a SmartServer. The PL/RF Bridge uses a plug-and-play RF connection for simple, low-cost installation. Each virtual segment communicates with the SmartServer over existing power lines.
- LumInsight Central Management Software ("CMS"): Our LumInsight CMS is used to manage the outdoor lighting network. Customers can choose to run an enterprise version of LumInsight or they can opt to access it as an Echelon hosted, cloud-based application.
- Third-Party Software: Third-party system software integrates with a city's enterprise applications and manages the outdoor lighting network using the SmartServer for control and communication. System software is available in hosted or server-based configurations.

Go-To-Market (Sales) Strategy

We sell our IIoT platform to OEMs in the building, lighting, and industrial controls markets directly and through distribution worldwide. These efforts are supported with application engineering, technical support, and industry experts working out of the U.S. as well as China, Japan, South Korea, India, the Netherlands, and the United Kingdom. In outdoor lighting, in addition to selling our platform to lighting OEMs worldwide, in some geographies we also offer the complete Lumewave by Echelon platform solution to end customers such as municipalities, cities, campuses and commercial enterprises through local system integration partners and channel representatives.

Echelon organizes its sales resources by region. Within a region, sales personnel selling our embedded solutions work directly with large OEM customers such as Honeywell, Schneider, Siemens, Trane, and others. Sales personnel focused on our lighting platform work with distribution partners, regional manufacturers’ representatives, and regional system integrators. We will often "sell with" these partners by calling on end users such as municipalities and enterprises at their side.

Product Development

Our future success depends in large part on our ability to enhance existing products, reduce product cost, and develop new products that offer technological competitiveness. We have made and intend to continue to make substantial investments in product development, while implementing strategies for overall product development cost reduction where appropriate.

Our strategy is to focus our product innovation efforts on enabling a platform that is versatile and capable of deployment in embedded and connected lighting markets. The platform is comprised of 3 tiers:

- The enterprise management and cloud tier,
- The edge server tier,
- and the device tier.

The platform is extensible to incorporate different types of end devices, protocols, services and business logic to drive sustainability/energy savings, enhance safety, increase efficiency, and manage livability. Key to the extensibility lies in the ability to incorporate selected new functionality and partner products. As an example, our recent proof of concept quickly incorporated weather data from the IBM Watson IoT platform and enabled us to study the balance of managing sustainability while enhancing safety for residents in a city. Also key to the extensibility lies in the ability to standardize at the appropriate layers, with hardware, operating systems, web capabilities, different physical and network protocols, new IoT messaging systems (like MqTT), data driven functionality, etc. Another key part of our product development strategy is balancing standardization with innovation, to optimize functionality, and intellectual property. As we build out this platform, we will aggressively file the appropriate patent disclosures to protect our innovation and intellectual property.

Our total expenses for product development were $9.3 million for 2017, and $8.3 million for 2016. Included in these totals were stock-based compensation expenses of $475,000 and $173,000 for the years ended December 31, 2017, and 2016, respectively.

To date, we have not capitalized any software development costs from our development efforts.

Marketing

Our marketing efforts focus on two key elements: awareness and demand generation/sales enablement. From an awareness perspective, we seek to generate visibility and credibility of our brand, the products and solutions that we offer, and the capabilities and benefits that they bring. Our marketing program comprises press releases, advertising, collateral, published technical and thought-leadership papers, newsletters, and customer case studies describing the benefits our customers are seeing from implementing our solutions. We also participate in industry events and trade shows, speak at relevant industry conferences, and are continually enhancing our global websites.

Marketing also focuses on making it easier for our sales teams and our partners to sell our solutions. We do this through a variety of demand generation and sales enablement activities such as webinars/seminars, lead-generation from our participation at industry exhibitions and conferences, and the production of focused selling tools such as sales playbooks, competitive analyses, and sales presentations and training. We also actively participate in LONMARK® International, an association directly focused on the adoption of our products.

We focus our sales teams using a systematic pipeline management process, whereby prospects are identified, qualified, and tracked, with the expectation that a portion of these opportunities are ultimately closed.

Principal Customers

During the years ended December 31, 2017 and 2016, we had one customer that accounted for a significant portion of our revenues: Avnet Europe Comm VA (“Avnet”), the primary distributor of our IIoT products in Europe and Japan. For the years ended December 31, 2017, and 2016, the percentages of our revenues attributable to sales made to Avnet was follows:

	Year ended December 31,	
	2017	2016
Avnet	28.0%	28.7%

Geographic Information

We operate in three main geographic areas: the Americas; Europe, Middle East and Africa (“EMEA”); and Asia Pacific / Japan (“APJ”). Each geographic area provides products and services to our customers located in the respective region. Our long-lived assets include property and equipment, goodwill, purchased intangible assets such as purchased technology and customer and channel relationships, and deposits on our leased facilities. Long-lived assets are attributed to geographic areas based on the country where the assets are located. As of December 31, 2017 and 2016, long-lived assets of approximately $2.1 million and $2.2 million, respectively, were domiciled in the United States. Long-lived assets for all other locations are not material to the consolidated financial statements.

We sell our products primarily in U.S. dollars to customers throughout the world. Revenues are attributed to geographic areas based on the country where the customer is domiciled. Our international sales include both export sales and sales by international subsidiaries and accounted for 60.9% of our total revenues for 2017 and 68.2% of our total revenues for 2016. Summary revenue information by geography for the years ended December 31, 2017 and 2016, is as follows (in thousands):

	Year ended December 31,	
	2017	2016
Americas	$13,316	$11,402
EMEA	10,765	14,115
APJ	7,586	6,868
Total	$31,667	$32,385

Supply Chain

Our supply chain strategy uses design and manufacturing services from third parties where it reduces our costs and takes advantage of consolidated purchasing power. We limit our internal supply chain activities to quality inspection, system integration, custom configuration, testing, and order fulfillment.

We maintain manufacturing agreements with Cypress Semiconductor related to the FT 3100 family of free topology transceivers. We also maintain manufacturing agreements with STMicroelectronics for production of our PL 3100 power line transceivers, and with Open-Silicon, Inc. for production of our Neuron 5000 microcontroller and the FT 5000 free topology receiver (which are manufactured at Taiwan Semiconductor Manufacturing Company).

For products requiring assembly, we utilize both third-party original design manufacturers (ODMs) and contract electronic manufacturers (CEMs). CEMs procure material and assemble, test, and inspect the final products to our design specifications. Our ODM partners perform the same services as CEMs but also provide design services to our product requirements.

Working Capital

As of December 31, 2017, we had working capital, defined as current assets less current liabilities, of $20.4 million, which was a decrease of approximately $2.7 million compared to working capital of $23.1 million as of December 31, 2016.

Competition

We believe the markets for our products are competitive and becoming more competitive in terms of pricing, product features, and distribution. In each of our markets, our competitors include both small companies as well as some of the largest companies in the electronics industry, operating either alone or together with trade associations and partners.

Our key competitors include established companies such as Cimcon Lighting, Inc., Cree Inc., Digi International, General Electric, LED Roadway Lighting, Maxim Integrated Products, Phillips, Siemens, Silver Springs Networks, STMicroelectronics, Telensa, Texas Instruments, and Tridium. We also see competition from embedded control companies like Freescale Semiconductor and Intel Corporation. In addition, the market has attracted and will continue to attract well-funded, venture-backed start-up companies. Key industry standard and trade group competitors include BACnet, Konnex, DALI, DeviceNet, HART, Profibus, ZigBee, and the ZWave Alliance.

To maintain and improve our competitive position, we must keep pace with the evolving needs of our customers and continue to develop and introduce new products, features, and services in a timely and efficient manner. The principal competitive factors that affect the markets for our products include:

- the price and features of our products such as adaptability, scalability, functionality, ease of use, and the ability to integrate with other products;
- our ability to anticipate changes in customer requirements and to develop new or improved products that meet these requirements in a timely manner;
- our product reputation, quality, performance, and conformance with established industry standards;
- our customer service and support;
- warranties, indemnities, and other contractual terms; and
- customer relationships and market awareness.

Additionally, while our product implementations are proprietary to Echelon and are often protected by unique, patented processes, key technologies such as LONWORKS and IzoT are open, meaning that many of our basic control networking patents are broadly licensed without royalties or license fees. For instance, all of the network management commands required to develop software that competes with our LNS software are published. As a result, our customers are capable of developing hardware and software solutions that compete with many of our products.

Government Regulation

Many of our products and the markets and industries in which they are used are subject to U.S. and foreign regulation as well as local, industry-specific codes and requirements. For example, the power line medium, which is the

communications medium used by some of our products, is subject to special regulations in North America, Europe, and Japan. In general, these regulations limit the ability of companies to use power lines as a communication medium. In addition, some of our competitors have attempted to use regulatory actions to reduce the market opportunity for our products or to increase the market opportunity for their own products. We have resisted these efforts and will continue to oppose competitors' efforts to use regulation to impede competition in the markets for our products. Our business might also be affected by other regulatory factors, including public utility commission or similar approvals and government mandates. This could lead to an extension of the sales cycle or even cancellation of a customer's order.

In addition, the market for our products might experience a movement toward standards-based protocols driven by governmental action. To the extent that we do not adopt such protocols or do not succeed in achieving adoption of other protocols we use as standards or de facto standards, sales of our products might be adversely affected. The adoption of voluntary standards or the passage of governmental regulations that are incompatible with our products or technology could limit the market opportunity for our products, which could harm our revenues, results of operations, and financial condition.

Proprietary Rights

We own registered patents in the United States and in selected foreign countries. Many of the specific patents that are fundamental to LONWORKS technology have been licensed to our customers with no license fee or royalties.

We also hold several trademarks in the United States and select foreign countries, many of which are registered, including Echelon, Lumewave by Echelon, LumInsight, LonBuilder, LonTalk, LONWORKS, Neuron, LON, LonPoint, LonMaker, IzoT, LNS, LonManager, Digital Home, and NodeBuilder.

Employees

As of February 28, 2018, we had 74 employees worldwide. About 49 employees are located at our headquarters in California and 12 employees are located in other offices throughout the United States. Our remaining employees are located in five countries worldwide, with the largest concentrations in China, Hong Kong, the Netherlands, and the United Kingdom. None of our employees are represented by a labor union. We have not experienced any work stoppages and we believe relations with our employees are good.

Where to Find More Information

We make our public filings with the Securities and Exchange Commission, or SEC, including our Annual Report on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K, and all exhibits and amendments to these reports, available free of charge at our website, www.echelon.com, as soon as reasonably practicable after we file such material with the SEC. These materials are located in the “Investor Relations” portion of our Web site under the link “SEC Filings.” The inclusion of our Web site address in this report does not include or incorporate by reference into this report any information on our Web site. Copies of our public filings may also be obtained from the SEC Web site at www.sec.gov.

Executive Officers of the Registrant

Ronald Sege, age 60, has been our President and Chief Executive Officer and a member of our board of directors since August 2010. He has been Chairman of the Board of Directors since October 2011. Prior to joining Echelon, he was President and Chief Operating Officer of 3Com Corporation from 2008 to 2010. He held the position of President and CEO of Tropos Networks from 2004 to 2008, and was the President and CEO of Ellacoya Networks from 2001 to 2004. Earlier in Mr. Sege's career, he was Executive Vice President at Lycos from 1998 to 2001 and he spent 10 years at 3Com holding various Executive Vice President and Vice President positions. Mr. Sege received his B.A. in Economics from Pomona College and earned an M.B.A. from the Harvard Business School.

Christopher Jodoin, age 52, was appointed Senior Vice President of Operations and Planning in January 2016 and served as Vice President of Operations and Planning from January 2015 to January 2016. Prior to that, he held various financial and operational positions at Echelon and played a key role in the divestiture of our Grid division in 2014.

Prior to joining Echelon in 2012, Mr. Jodoin was Vice President of Integration at InVentiv Health. He also held a variety of senior financial and operational positions at Hewlett Packard and 3Com Corporation. Mr. Jodoin received a B.A in Economics from Boston College and an M.B.A from Northeastern University.

Andrew Lovit, age 57, has been our Senior Vice President of Worldwide Sales since September 2017. He joined Echelon from Procera Networks, where he served as Senior Vice President of Global Sales and Services from 2014 to 2017. Prior to that, Mr. Lovit served as Senior Vice President of Global Field Operations for Fortress Solutions. He has also held Vice President of Sales and Field Operations roles at Bivio Networks, Ericsson, SkyStream Networks, Paradyne Corporation, and 3Com. Mr. Lovit holds a Bachelor of Science degree in Business Administration from The Ohio State University.

C. Michael Marszewski, age 50, has been our Vice President and Chief Financial Officer since April 2015. Since joining Echelon in 1999, Mr. Marszewski has served in a variety of financial positions, including most recently Vice President Corporate Controller and Chief Accounting Officer, and has played important roles in strategic projects including acquisitions, divestitures, and private placement of securities. Prior to joining Echelon, Mr. Marszewski held positions at Stanford Telecommunications, National Semiconductor, and Arthur Andersen LLP. He earned his Bachelor's Degree in Accounting at Santa Clara University.

Sohrab Modi, age 57, was appointed Senior Vice President, Engineering and Chief Technology Officer in March 2017 and has served as Vice President and CTO since February 2015 and CTO since joining Echelon in September 2014. Prior to joining our company Mr. Modi was Vice President and Chief Technology Officer at Futurewei, a division of Huawei. From 1999 to 2008, Mr. Modi held senior Engineering and General Management positions at Sun Microsystems, including Vice President in the Chief Technology Office. Previously, Mr. Modi held engineering management roles at Novell. Mr. Modi holds a B.S. degree in Physics from the University of Mumbai and an M.S. degree in Computer Science from the Rochester Institute of Technology.

Alicia Jayne Moore, age 58, our Senior Vice President, Chief Legal and Administration Officer and Secretary to the Board of Directors, joined Echelon on July 15, 2013. Prior to joining our company, Ms. Moore provided strategic legal and business consulting services to several public and private companies and foundations from 2008 to 2013. Prior to that, Ms. Moore was the Vice President, Corporate Business Development, General Counsel and Secretary for Extreme Networks, Inc. She also served as General Counsel for AristaSoft, Inc. and Adaptec, Inc. Ms. Moore practiced law as an associate in the law firms of Coudert Brothers, LLP and Ware & Friedenrich, LLP (now DLA Piper). Ms. Moore received an A.B degree in International Relations from Stanford University, and her law degree from U.C.L.A. School of Law.

ITEM 1A. RISK FACTORS

Investing in our common stock involves a high degree of risk. Interested persons should carefully consider the risks described below in evaluating our company. Additional risks and uncertainties not presently known to us, or that we currently consider immaterial, may also impair our business operations. If any of the following risks actually occur, our business, financial condition or results of operations could be materially adversely affected. In that case, the trading price of our common stock could decline. Before deciding to purchase, hold or sell our common stock, you should carefully consider the risks described in this section. This section should be read in conjunction with the condensed consolidated financial statements and accompanying notes thereto, and Management's Discussion and Analysis of Financial Condition and Results of Operations, both of which are included in this Annual Report on Form 10-K.

There can be no guarantee that the IIoT market in general, and the lighting market segment in particular, will develop as expected, or that we will be successful in pursuing these market opportunities.

We have devoted and will continue to devote significant effort and resources to leverage our technology and develop and launch our platform to customers within the IIoT market. However, to date, the market for our products has not developed as quickly as anticipated, and our efforts to capitalize on these opportunities have not produced the results we anticipated. Our efforts to capitalize on these opportunities may not be successful in the near term, or at all.

Although revenues from our legacy embedded systems products have been increasing in recent quarters, prior to 2017 they had been declining annually for several years. We cannot guarantee that the recent improvement in sales of these

products will continue.

We have decided to focus heavily on lighting controls within the IIoT as our targeted market. As we have a limited operating history in this market segment, we are subject to a number of risks and uncertainties that may impact our ability to gain market acceptance for our lighting control products.

In recent years, we have invested substantial resources in the development and commercialization of control networking solutions for the lighting market. However, we have a limited operating history in this market segment, and we may not recognize a meaningful amount of revenues from these efforts in the near future, or at all. Our efforts to gain market acceptance for our lighting control products and solutions are subject to considerable risk and uncertainty, including:

- the risk of competition and emerging technologies (see "If we do not develop and maintain adequate distribution channels, our revenues will be harmed" for additional information on the risks associated with competing for market share);
- the risk that we will not be able to develop adequate sales channels for these new products and services (see "Our IIoT revenues may not meet expectations, which could cause volatility in the price of our stock" for additional information on the risks associated with establishing new sales channels);
- the risk that we misjudge the market and fail to develop solutions that meet the requirements of our existing or potential customers;
- the risk that our solutions will suffer security breaches or otherwise allow unauthorized access to, or acquisition of, data;
- the risk that our products will not perform adequately due to defect or misuse by customers (see "Liabilities resulting from defects in or misuse of our products, whether or not covered by insurance, may delay our revenues and increase our liabilities and expenses" for additional information on the risks associated with defective or misused products); and
- the risk that our supply chain for components is unable to meet our demand (see "Because we depend on a limited number of key suppliers and in certain cases, a sole supplier, the failure of any key supplier to produce timely and compliant products could result in a failure to ship products, or could subject us to higher prices, which would harm our results of operations and financial position" for additional information on the risks associated with manufacturing).

We have changed our business model significantly in recent years, which makes it difficult to evaluate our prospects and forecast our future results of operations.

Although we commenced our business in 1988, we have made significant changes to our business model in recent years. Historically, we derived all of our revenues from our embedded systems and Grid businesses. However, in 2014, we sold our Grid business, and prior to 2017, we had been experiencing a decline in revenues from our legacy embedded systems products and services, including a cessation in our shipments to Enel.

In recent years, we have shifted our focus to networking solutions for the outdoor lighting market. Unlike our legacy embedded systems products, which are typically sold to OEMs for incorporation into their products, which are then sold to their commercial and industrial customers, our lighting solutions products are more project based, being sold through energy services companies and distributors to municipalities, enterprise and educational campuses, retailers, and other end users. In addition, our outdoor lighting solutions typically generate lower overall gross margins than do our embedded systems products.

As we have a limited operating history with our lighting solutions, our ability to evaluate our current business and forecast our future results of operations and effectively assess our future prospects is subject to a number of uncertainties that may impact our ability to plan for and model future growth. Our historical revenue growth should not be considered indicative of our future performance and such growth may stagnate or decline over time. Further, in future periods, our revenues could decline for a number of reasons, including the failure to offset the expected decline in revenues from our embedded systems products by an increase in sales of our lighting solutions, changes in our pricing structure, increased competition in the IIoT market generally or in the lighting market in particular, or our failure, for any reason, to capitalize on growth opportunities. We have encountered and will continue to encounter risks and uncertainties frequently experienced by companies in rapidly changing industries. If our assumptions regarding these risks and uncertainties, which we use to plan our business, are incorrect or change, or if we do not

address these risks successfully, our operating and financial results could differ materially from our expectations, and our business could suffer.

Our revenues may not meet expectations, and our operating expenses may be higher than we anticipate, which could cause volatility in the price of our stock.

As we attempt to grow our IIoT business, we expect to commit significant resources developing new products in emerging markets. In addition, our IIoT business operates in nascent markets, such as outdoor lighting and controls, in which we have yet to build a reliable customer base. As a result, sales of our products are unpredictable and yet to be proven, and sales and marketing costs related to our products may be significant. These factors could have a negative impact on our revenues and make it difficult to project our financial results, which could cause declines and volatility in our stock price. Additionally, because we are operating

in an emerging market, risks that we are not currently able to identify are likely to materialize and could negatively impact our operations and financial condition.

Emerging markets are particularly dynamic and highly competitive, and we may lose sales to our competitors, which would harm our revenues and results of operations.

Competition in the IIoT market is intense and involves rapidly changing technologies, evolving industry standards, frequent new product introductions, industry consolidations, effective management of distribution channels, rapid changes in customer or regulatory requirements, and localized market requirements. In each of our existing and target markets, we compete with a wide array of manufacturers, vendors, strategic alliances, systems developers and other businesses. The future of our IIoT business depends significantly on our ability to react to changing customer needs by enhancing our existing products and developing new products. There can be no guarantee, however, that new products and product enhancements will be accepted by businesses and consumers. If we make investments in technologies that do not gain market acceptance, our business may not grow as anticipated. In addition, future product offerings by our competitors can render our products obsolete. Any failure to evolve with emerging technologies and our competitors could cause a loss of market share and result in declining revenues.

The principal competitive factors that affect the markets for our products include the following:

- our ability to anticipate changes in customer or regulatory requirements and to develop, or improve, our products to meet these requirements in a timely manner;
- the price and features of our products such as adaptability, scalability, functionality, ease of use, and the ability to integrate with other products;
- our product reputation, quality, performance, and conformance with established industry standards;
- our ability to expand our product line to address our customers' requirements;
- our ability to effectively manage and expand our distribution channels to address new markets for current and future products;
- our ability to meet a customer's required delivery schedules;
- a customer's willingness to do business with us because of our size and perceived concerns regarding our liquidity and financial strength relative to our competitors;
- the risk of industry consolidation, which is particularly high in emerging markets such as the IIoT;
- our customer service and support;
- warranties, indemnities, and other contractual terms; and
- customer relationships and market awareness.

Competitors for our IIoT products include some of the largest companies in the electronics industry, operating either alone or together with trade associations and partners. Key company competitors include companies such as Cimcon Lighting, Inc., Cree Inc., Digi International, General Electric, LED Roadway Lighting, Maxim Integrated Products, Philips, Siemens, Silver Spring Networks, STMicroelectronics, Telensa, Texas Instruments, and Tridium. Key industry standard and trade group competitors include BACnet, DALI, DeviceNet, HART, Konnex, Profibus, ZigBee, and the ZWave Alliance in the IIoT market. Each of these standards and/or alliances is backed by one or more competitors. For example, the ZigBee alliance includes over 300 member companies with promoter members, such as Ember, Emerson, Freescale, Kroger, Landis+Gyr (a subsidiary of Toshiba), Philips, Reliant Energy, Schneider Electric, STMicroelectronics, Tendril, and Texas Instruments. Additionally, because we are operating in an emerging market, it is likely that additional competitors could surface and rapidly gain market share.

Many of our competitors, alone or together with their trade associations and partners, have significantly greater financial, technical, marketing, service and other resources, significantly greater name recognition, and broader product offerings, all of which may impact the willingness of customers and potential customers to do business with us. Our future success will depend on our ability to enhance our existing products, to introduce new products to meet changing customer requirements and emerging technologies, and to demonstrate the performance advantages and cost-effectiveness of our products over competing products. If we are unable to do so and thus are unable to compete effectively in any of the markets we serve, our revenues, results of operations, and financial position would be harmed.

Fluctuations in our results of operations may cause our stock price to decline.

Our quarterly and annual results of operation have varied significantly from period to period, and we have sometimes failed to meet market expectations. Moreover, we have a history of losses and negative cash flow and cannot assure you that we will achieve sustained profitability in the future. We expect that our results of operations will continue to vary as a result of a number of factors, many of which are outside of our control, including the following:

- orders may be cancelled;
- the mix of products and services that we sell may change to a less profitable mix;
- shipment, payment schedules, and product acceptance may be delayed;
- our products may not be purchased by OEMs, systems integrators, service providers and end-users at the levels we project;
- our ability to develop products that comply with future regulations and trade association guidelines;
- the revenue recognition rules relating to certain of our products could require us to defer some or all of the revenue associated with product shipments until certain conditions, such as delivery and acceptance criteria for our software and/or hardware products, are met in a future period;
- our CEMs may not be able to provide quality products on a timely basis, especially during periods where capacity in the CEM market is limited;
- our products may not be manufactured in accordance with specifications or our established quality standards, or may not perform as designed;
- downturns in any customer's or potential customer's business, or declines in general economic conditions, could cause significant reductions in capital spending, thereby reducing the levels of orders from our customers;
- we may incur costs associated with any future business acquisitions; and
- any future impairment charges related to our intangible assets that are required to be recorded under generally accepted accounting principles in the United States may negatively affect our earnings and financial condition.

Any of the above factors could, individually or in the aggregate, have a material adverse effect on our results of operations and our financial condition, which could cause our stock price to decline

If we are not able to develop or enhance our products in a timely manner, our revenues will suffer.

Due to the nature of development efforts in general, we can experience delays in the introduction of new or improved products beyond our original projected shipping date for such products. Historically, when these delays have occurred, we experienced an increase in our development costs and a delay in our ability to generate revenues from these new products. In addition, such delays could cause us to incur penalties if our deliveries are delayed, could otherwise impair our relationship with any of our customers that were relying on the timely delivery of our products in order to complete their own products or projects, or could cause the customer to cancel orders or to seek alternate sources of supply or other remedies. Any delay in the introduction of new products could impact future revenue targets or forecasts.

We are sometimes required to modify our products to meet local rules and regulations. Given the competitive nature of these markets, we may not be able to increase the price of such products to reflect the costs of such modifications. In addition, given the long-term nature of development activities, we may be required to undertake such modifications prior to receiving firm commitments or orders from our customers. In either of these or other similar scenarios, we may not be able to recover our costs attributable to required product modifications.

When we develop new products, there is no guarantee that these new products will meet our customers' requirements or will otherwise be acceptable to them, which could cause them to discontinue buying our products. This could have a material adverse effect on our revenues and results of operations.

We intend to continue investing resources in our development activities, which could expose us to risks, such as protection of intellectual property, investment risk, and labor costs and other matters. We could also be adversely affected by delays or cost increases experienced by third parties that are developing products on our behalf.

The sales cycle for our products is often lengthy and unpredictable.

The sales cycle between initial customer contact and execution of a contract or license agreement with a customer or purchaser of our products can vary widely. Initially, we must educate our customers about the potential applications of and cost savings associated with our products.

If we are successful in this effort for our embedded systems products, OEMs will typically conduct extensive and lengthy product evaluations before making a decision to design our products into their offerings. Once the OEM decides to incorporate our products, volume purchases of our products are generally delayed until the OEM's product development, system integration, and product introduction periods have been completed. In addition, changes in our customers' budgets, or the priority they assign to control network development, could also affect the sales cycle.

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For our outdoor lighting controls products, the sales cycle can also be extended. As a nascent market, many of our sales channel partners, as well as end use customers, are not aware of the benefits our controls technology can bring to their lighting systems. This requires extensive educational efforts on our part and these efforts may not be successful or meet our objectives. Even with the benefit of this eduction, when dealing with larger projects such as to municipalities, the post-education sales cycle typically commences with a trial deployment of relatively low value to us. If the trial is successful, the end use customer may commence a full scale deployment that could take months or years to complete, if at all.

In addition, potential customers for our products, both embedded systems and outdoor lighting controls, include local, state and federal government authorities. Sales to government authorities can be extended and unpredictable. Government authorities generally have complex budgeting, purchasing, and regulatory processes that govern their capital spending, and their spending is likely to be adversely impacted by economic conditions. In addition, in many instances, sales to government authorities may require field trials and may be delayed by the time it takes for government officials to evaluate multiple competing bids, negotiate terms, and award contracts. We further face the risk of cancellation during development and production due to regulatory, government and geopolitical changes, and delays in installing, operating, and evaluating the results of any field trials before full implementation of our products. For these reasons, the sales cycle associated with our IIoT products is subject to a number of significant risks that are beyond our control. Consequently, if our forecasted customer orders are not realized, or are delayed, our revenues and results of operations could be materially and adversely affected. In addition, an extended sales cycle may result in our inability to recognize revenue from existing or new projects until the end of several fiscal quarters. This may also make it difficult to predict our financial results and increase the volatility of our stock price.

If we do not develop and maintain adequate distribution channels, our revenues will be harmed.

The market for our products is new and unproven, and we cannot rely solely on our existing distributors to sell our products. Therefore, we are focused on expanding our distribution channel to include new distributors in order to generate revenue from product sales. We expect that the distribution channel for our products will be dispersed and it is difficult to predict how long it will take and how costly it will be to develop. We may not be successful in developing and maintaining an adequate distribution channels within our expected timeframe and cost expectations, if at all. In addition, if any of our new or existing distributor partners fail to dedicate sufficient resources to market and sell our products, our revenues could suffer. Furthermore, if our existing distributor partners were to significantly reduce their inventory levels for our products, we could expect a decrease in service levels to our end-use customers.

Sales of our products may fail to meet our financial targets, which would negatively impact our results of operations and expected return on investment in the IIoT market.

We have invested and intend to continue to invest significant resources in the development and sales of products in the emerging IIoT market, particularly in the outdoor lighting market segment. If we are unable to receive orders for, ship, and recognize revenue for our products in a timely manner, and in the quantities and at prices in line with our targets, our financial results will be harmed. Our long-term financial goals include expectations for a return on these investments, but we may or may not ever realize any return whatsoever on this investment of resources.

Over the last several years, our market share in our existing embedded systems business has declined due to increased competition, reduced levels of investment in our LONWORKS product line, and pricing pressures faced around the world. However, during 2017, our embedded systems revenues grew across a broad base of customer applications, ranging from semiconductor manufacturing monitoring, to building automation, HVAC controls, and more. We believe this trend may be taking hold and working to Echelon's benefit, as companies expand into IIoT deployments and leverage LONWorks' capability.

Prior to 2017, annual revenues generated from our embedded systems business failed to meet our expectations. If this revenue decline were to return, our ability to continue funding our entry into the outdoor lighting segment could be harmed.

In order to achieve our financial targets, we believe that we must meet the following objectives:

- achieve acceptance of our products in the IIoT market, particularly the outdoor lighting market, in order to increase our revenues;

- manage our operating expenses to a reasonable percentage of revenues; and
- manage our cash resources prudently.

Even if we meet these objectives, there can be no assurance that we will meet our overall financial targets and objectives.

A significant portion of our operating expenses are fixed. Therefore, if we cannot achieve our revenue targets, our use of cash balances would increase, our losses would increase, and/or we would be required to take additional actions necessary to reduce expenses. We cannot assure you that we will meet any or all of these objectives to the extent necessary to achieve our financial goals and, if we fail to achieve our goals, our results of operations are likely to be harmed.

In our legacy embedded systems business, we may be unable to promote and expand acceptance of our open, interoperable control systems over competing protocols, standards, or technologies.

LONWORKS and IzoT technology are open, meaning that many of our technology patents are broadly licensed without royalties or license fees. As a result, our IIoT customers are able to develop hardware and software solutions that compete with some of our products. Because some of our customers are OEMs that develop and market their own control systems, these customers, in particular, could develop competing products based on our open technology. For instance, we have published all of the network management commands required to develop software that competes with our LNS software.

In addition, many of our IIoT competitors are dedicated to promoting closed or proprietary systems, technologies, software and network protocols or product standards that differ from or are incompatible with ours. We also face strong competition from large trade associations that promote alternative technologies and standards for particular vertical applications or for use in specific countries. These include BACnet, DALI, and KNX in the buildings market; DeviceNet, HART, and ProfiBus in the industrial controls market; TCN in the rail transportation market; and Echonet, ZigBee, and Z-Wave in the home control markets.

The ability of our IIoT products to interoperate with multiple standards is important to our success. Our technologies, protocols, or standards may not be successful or we may decide not to invest our resources at the levels required in order to compete with new or enhanced products or standards introduced by our IIoT product line competitors, which would have a material adverse effect on our revenues, results of operations, and financial condition.

We are increasingly dependent on third-party developers.

We are increasingly reliant on various third parties for the development of software used in our products. There is a risk that the software provided by these third parties could contain errors or defects that could adversely impact the quality of our products. In addition, these third parties may use open source or other code that contains security flaws, which may cause our products to be more prone to hacking or other security incidents. We may also be negatively impacted by employee turnover or other challenges that these third-party developers face in their own businesses. Third parties may also choose not to develop software for our products if we do not have adequate market share or sufficient perception of future success. The materialization of any of these risks would impact our ability to deliver quality products on a timely basis, which could adversely impact our reputation and brand and harm our business and results of operations.

In addition, many of these third-party developers are located in markets that are subject to political risk, intellectual property misappropriation, corruption, infrastructure problems and natural disasters, in addition to country specific privacy and data security risks, given current legal and regulatory environments. The failure of these third parties to meet their obligations and adequately deploy business continuity plans in the event of a crisis and/or the development of significant disagreements, natural or man-made disasters or other factors that materially disrupt our ongoing relationship with these developers could negatively affect our operations.

Because we depend on a limited number of key suppliers and, in certain cases, a sole supplier, the failure of any key supplier to produce timely and compliant products could result in a failure to ship products, or could subject us to higher prices, which would harm our results of operations and financial position.

Our future success will depend significantly on our ability to timely manufacture our products cost effectively, in sufficient volumes, and in accordance with quality standards. For most of our products requiring assembly, we rely on a limited number of contract electronic manufacturers (CEMs), principally Bel-Fuse. These CEMs procure material and assemble, test, and inspect the final products to our specifications. This strategy involves certain risks, including reduced control over quality, costs, delivery schedules, availability of materials, components, finished products, and manufacturing yields. For example, an extended delay in the supply of a key component could disrupt the

manufacturing of our products. Any such interruption in the supply of key components could therefore have a material adverse effect on our customer relationships and revenues. As a result of these and other risks, our CEMs could demand price increases for manufacturing our products. The Bel-Fuse factories, where our products are manufactured, are located in China. The Chinese government maintains programs, whereby labor rates for the manufacture of our products will increase over time. In addition, our agreements with our CEMs make us responsible for components and subassemblies purchased by the CEMs when based on our forecasts or purchase orders. Accordingly, we will be at risk for any

excess and obsolete inventory purchased by our CEMs. Lastly, CEMs can experience turnover, instability, and lapses in manufacturing or component quality, exposing us to additional risks as well as missed commitments to our customers.

We also maintain manufacturing agreements with a limited number of semiconductor manufacturers for the production of key products. Cypress Semiconductor is the sole licensee, manufacturer and distributor for the Cypress Neuron, which is an important part of the LONWORKS portfolio. As a result, we or our customers may experience longer lead times and higher pricing for these parts, which could result in reduced orders for our products from these same customers. In addition, Cypress Semiconductor could decide to reduce or cease production of the Neuron chip in the future, at any time, with or without advance notice to us.

The FT 5000 free topology transceiver and the Neuron 5000 are sole sourced from the Taiwan Semiconductor Manufacturing Company (TSMC) foundry through our aggregator Open Silicon. In addition, we currently purchase several key products and components from sole or limited source suppliers with which we do not maintain signed agreements that would obligate them to supply to us on negotiated terms. Any sole source relationship could make us vulnerable to price increases, particularly where we do not maintain long-term supply agreements with the supplier, or to supply disruptions that would result if the supplier issued an end of life notice with respect to a key product.

We are continuing to review the impact that economic factors are having on our suppliers. Some of these suppliers are large, well-capitalized companies, while others are smaller and more highly leveraged. In order to mitigate these risks, we may take actions such as increasing our inventory levels and/or adding additional sources of supply. Such actions may increase our costs and increase the risk of excess and obsolete inventories. Even if we undertake such actions, there can be no assurance that we will be able to prevent any disruption in the supply of goods and services we receive from these suppliers.

We may also elect to change any of these key suppliers. As part of such a transition, we may be required to purchase certain raw material and in-process inventory from the existing supplier and resell it to the new source. In addition, if any of our key suppliers were to stop manufacturing our products or supplying us with our key components, it could be expensive and time consuming to find a replacement. Also, as our business grows, we will be required to expand our business with our key suppliers or find additional sources of supply. There is no guarantee that we would be able to find acceptable alternative or additional sources. Additional risks that we face if we must transition between CEMs include:

- moving raw material, in-process inventory, and capital equipment between locations, some of which may be in different parts of the world;
- reestablishing acceptable manufacturing processes with a new work force; and
- exposure to excess or obsolete inventory held by contract manufacturers for use in our products.

The failure of any key manufacturer to produce a sufficient number of products on time, at agreed quality levels, and fully compliant with our product, assembly and test specifications could result in our failure to ship products in a timely manner or at all, which would adversely affect our revenues and gross profit, and could result in claims against us by our customers, which could harm our results of operations and financial position. Any such failures could also have a negative impact on our ability to project our financial results, which could result in volatility in our stock price.

Because our products use components or materials that may be subject to price fluctuations, shortages, interruptions of supply, or discontinuation, we may be unable to ship our products in a timely fashion, which would adversely affect our revenues, harm our reputation, and negatively impact our results of operations.

We may be vulnerable to price increases for products, components, or materials, such as silver, copper, and cobalt. We generally do not enter into forward contracts or other methods of hedging against supply risk for these items. In addition, we have in the past and may in the future experience shortages or interruptions in supply for certain of these items, including products or components that have been or will be discontinued, which can cause us to delay shipments beyond targeted or announced dates. We have also reduced our inventory levels from historical levels, which could impact our ability to supply our customers with products in a timely manner if there was an unexpected increase in demand. Such shortages or interruptions could result from events outside our control, as was the case with

the earthquake and tsunami in Japan in March 2011. To help address these issues, we may decide from time to time to purchase quantities of these items that are in excess of our estimated requirements. As a result, we could be forced to increase our excess and obsolete inventory reserves to provide for these excess quantities, which could harm our results of operations. In addition, if a component or other product goes out of production, we may be required to requalify substitute components or products, or even redesign our products to incorporate an alternative component or product.

If we experience any shortage of products or components of acceptable quality, or any interruption in the supply of these products or components, or if we are not able to procure them from alternate sources at acceptable prices and within a reasonable

period of time, our revenues, gross profits or both could decrease. In addition, under the terms of some of our contracts with our customers, we may also be subject to penalties if we fail to deliver our products on time.

Our business depends on the Internet and its continued and unimpeded access and development.

The Internet is crucial to the operations of many of our IIoT products and is a key component of the IIoT market as a whole. Our reliance on the Internet exposes us to a number of risks and uncertainties that are beyond our control, including risks related to privacy and data security. It is difficult to quantify the impact that any future security or performance problems associated with the Internet may have on our products and revenues.

In addition, state, federal and foreign regulators could adopt laws and regulations that impose additional burdens on companies that conduct business over the Internet. The growth and development of the market for online services may prompt calls for more stringent consumer protection laws or laws that may inhibit the use of Internet-based communications or the information contained in these communications. The adoption of any additional laws or regulations may impact the growth of the IIoT market. Any new legislation or regulations, application of laws and regulations from jurisdictions whose laws do not currently apply to our business, or application of existing laws and regulations to the IIoT and other related services could increase our costs and harm our growth.

In particular, there is increasing focus on privacy and data security laws and regulations applicable to the IoT. A wide variety of provincial, state, national, and international laws and regulations apply to the collection, use, retention, protection, disclosure, transfer and other processing of personal data. Regulatory authorities have increased their privacy- and data security-related activity in the IoT domain in recent years. For example, the Federal Trade Commission released a report on January 27, 2015 with recommendations for privacy and data security applicable to connected devices, objects and sensors.We also may become obligated to comply with, or may choose to comply with, self-regulatory or other requirements applicable to privacy or data security.

The privacy- and data security-related laws and regulations that may apply to us are evolving and subject to differing interpretation and enforcement, and may result in ever-increasing regulatory and public scrutiny and escalating levels of enforcement and sanctions. For example, the European Union General Data Protection Regulation, which becomes fully effective in May 2018, imposes more stringent data protection requirements and provides for greater penalties for noncompliance. Our actual or perceived failure to comply with applicable laws and regulations or other actual or alleged obligations relating to privacy or data security, or to protect personal data, could result in regulatory investigations or regulatory enforcement actions and remedies against us, including fines, imprisonment of company officials and public censure, private litigations, claims for damages, damage to our reputation and loss of goodwill (both in relation to existing end use customers and prospective end use customers), any of which could have a material adverse effect on our operations, financial performance, and business.

If our IIoT solutions become subject to cyber-attacks, or if public perception is that they are vulnerable to cyber-attacks, our reputation and business would suffer.

We have designed our IIoT products, including our outdoor lighting solutions products, to interoperate with other third-party products and systems. Although we attempt to safeguard our products and solutions from cybersecurity threats, the potential for cyber security attacks and other incidents continues to evolve in scope and frequency.

Advances in and expanding availability of technical tools to enable cybersecurity attacks, and increasing sophistication of the threats, deepen the risk of potential security incidents. This risk expands as new protocols and devices are implemented into our products and systems, and as customer requirements evolve. Should our products, or the combination of our products into third party systems, fail to prevent or be unable to withstand any such threats or cyber-attacks, or if our partners or customers fail to safeguard applicable technologies, products or the systems with adequate security policies and measures or otherwise, our business and reputation may be harmed.

We have attempted to design certain of our products to prevent and monitor unauthorized access, misuse, modification or other activities related to those products and the systems into which the products are intended to be placed. Despite our security measures, our products or systems may be subject to unauthorized break ins, viruses, disruptions,

high-jacking, cyber terrorism, misuse, tampering, other unauthorized access or modification, or unauthorized access to, or acquisition, loss, or alteration of, data. Should our products fail to perform, be unable to withstand a cyber-attack, or otherwise suffer a security incident, or be perceived to have suffered any kind of security vulnerability or cyber incidents, we could face legal liability, and encounter material adverse financial and reputational harm.

In addition, we believe that there could be incidents of security breaches in the future which could receive significant publicity and visibility. Any such publicity or visibility, regardless of whether the problem is due or related to the performance or security measures of our products or systems, could have a negative effect on public confidence, or cause a perception that our solutions are or could be subject to similar attacks or breaches, and our business, results of operations and financial condition may be materially and adversely affected. Such an event could also result in a material adverse effect on the market price of our common stock, independent of the direct effects on our business.

Furthermore, because some of the information collected by some of our solutions is or may be considered personal data or otherwise may be alleged to be confidential or proprietary to our customers or third parties, a cyber-attack or other data security incident, including any unauthorized access to, loss of, or acquisition of data collected or maintained by our solutions, could violate, or be alleged to violate, applicable privacy, consumer or information security laws, regulations or other obligations. Any of the foregoing could cause us to face regulatory investigations and enforcement actions, private litigation, and other financial or legal liability, as well as harm to our reputation and business, any of which could have a material adverse effect on our business and financial performance.

We are dependent on technology systems and third-party content that are beyond our control.

Our success in the IIoT market will depend in part on the availability of online services and Internet connections to facilitate data transmission. In most instances, these services will be provided by third parties and will be outside of our control. Even when we are not responsible for connectivity or other problems, users of our products may attribute the problem to us. For example, many of our customers rely on the capacity, reliability and security of wireless networks owned and controlled by third parties to use our IIoT products. However, the price of access and operational integrity of online services, wireless networks and Internet connections are beyond our control. As a result, it may be difficult to identify the source of problems if they occur. This could diminish our brand and harm our business, divert the attention of our technical personnel from our product development efforts or cause significant customer relations problems.

Information Technology system security failures, cyber-attacks, and other technological breaches could cause harms to our business.

We also rely on the security of our third party providers to protect our proprietary information and information of our customers. Information technology system failures, including a breach of our or our third party providers' data security, could disrupt our ability to function in the normal course of business by potentially causing, among other things, an unintentional disclosure of customer information. Despite our implementation of security measures or those of our third party providers, information systems may be vulnerable to threats such as computer hacking, cyber-terrorism or other unauthorized attempts by third parties to access, modify or delete our or our customers' data or otherwise disrupt our systems. Any such breach could have a material adverse effect on our business, results of operations, and our reputation as a provider of data collection, and secure and reliable device connection, collaboration and communications solutions, including legal claims for damages or injunctive relief under state, federal and foreign laws, reputational damage, and decreased revenues.

We have designed our IIoT products and solutions products to interoperate with other third party products and systems. Although we attempt to safeguard our products and solutions from cybersecurity threats, the potential for cyber security attacks continues to evolve in scope and frequency.

We face operational and other risks associated with our international operations, which may adversely affect our revenues, results of operations, and financial condition.

We have operations located in seven countries and our products are sold in many more countries around the world. Revenues from international sales, which include both export sales and sales by international subsidiaries, accounted for about 60.9% and 68.2% of our total revenues for the years ended December 31, 2017 and 2016, respectively. We expect that international sales will continue to constitute a significant portion of our total revenues. Given our high dependency on sales of our products into Europe, the ongoing financial crisis in that region, which may be adversely impacted by the "Brexit" vote in the United Kingdom, could adversely affect our financial results.

Other risks inherent in our international business activities include, but are not limited to, the following:

- timing of and costs associated with localizing products for foreign countries and lack of acceptance of non-local products in foreign countries;
- that the nature and composition of our products may subject us to any number of additional legal requirements, which might include, but are not limited to, data privacy regulations, import/export regulations and other similar requirements;

- challenges in managing international operations;
- the burdens of complying with a wide variety of foreign laws and any related implementation costs;
- the applicability of foreign laws that could affect our business or revenues, such as laws that purport to require that we return payments that we received from insolvent customers in certain circumstances; and unexpected changes in regulatory requirements, tariffs, and other trade barriers;
- cultural differences that could make it more difficult to sell our products or could result in allegations that sales activities have violated the U.S. Foreign Corrupt Practices Act or similar laws that prohibit improper payments in connection with efforts to obtain business;
- exchange rate fluctuations;
- the imposition of tariffs or other trade barriers on the importation of our products;
- potentially adverse tax consequences, including restrictions on repatriation of earnings;
- economic and political conditions in the countries where we do business;
- differing vacation and holiday patterns in other countries, particularly in Europe;
- increased costs of labor, particularly in China;
- labor actions generally affecting individual countries, regions, or any of our customers, which could result in reduced demand for, or could delay delivery or acceptance of, our products; and
- international terrorism.

Any of these factors could have a material adverse effect on our revenues, results of operations, and our financial condition.

Our executive officers and technical personnel are critical to our business and the loss of one or more key employees or our inability to attract and retain qualified personnel could harm our business.

Our success depends substantially on the performance of our executive officers and key employees. Due to the specialized technical nature of our business and limited staff, we are particularly dependent on our Chief Executive Officer and other executive officers, as well as our technical personnel. Our future success will depend on our ability to attract, integrate, motivate and retain qualified executive, managerial, technical, sales, and operations personnel, particularly given the overall economic climate and the emphasis on reducing expenses at our company. Competition for qualified personnel in our business areas is intense, and we may not be able to continue to retain qualified executive officers and key personnel and attract new officers and personnel when necessary. Our product development and marketing functions are largely based in Silicon Valley, which is a highly competitive marketplace. It may be particularly difficult to recruit, relocate and retain qualified personnel in this geographic area. Moreover, the cost of living, including the cost of housing, in Silicon Valley is known to be high. Because we are legally prohibited from making loans to executive officers, we will not be able to assist potential key personnel as they acquire housing or incur other costs that might be associated with joining our company. We may need to invest significant amounts of cash and equity to attract and retain new employees and expend significant time and resources to identify, recruite, train, and integrate such employees, and we may never realize returns on these investments. In addition, if we lose the services of any of our key personnel and are not able to find suitable replacements in a timely manner or fail to adequately plan for the succession of key personnel, our business could be disrupted, other key personnel may decide to leave, and we may incur increased operating expenses in finding and compensating their replacements.

If we are unable to obtain additional funds when needed, our business could suffer.

For the last several years, our combined cash, cash equivalent, and short-term investment balance has declined. As we continue to implement our long-term strategic focus on the IIoT business, including the outdoor lighting controls market, this trend may continue.

As our cash balances decline, customers or potential customers may become less interested in doing business with us, or we may not satisfy the financial criteria they have established for their suppliers. In addition, from time to time we may also decide to use a portion of our cash balances to settle alleged warranty issues that may arise with our customers or, as noted under the heading "Legal Proceedings," in connection with litigation. We may do so even if we do not believe we have liability to our customers or in connection with such litigation, in order to limit our risk, reduce outlays to third party providers, and for administrative convenience. In the future, to the extent that our revenues grow or as we may determine necessary to maintain adequate supply levels, we may experience higher levels of inventory

and accounts receivable, which will also use our cash balances. In addition, to the extent we plan to make alternate uses of our facilities, we may incur additional cash expenditures. We may also use our cash reserves to strategically acquire or invest in other companies, products, or technologies that are complementary to our business. Lastly, our combined cash, cash equivalents, and short-term investment balances could be negatively affected by the various risks and uncertainties that we face, especially in light of our focus on the nascent and emerging IIoT things market, and any changes in our planned cash outlay could negatively affect our existing cash reserves.

There can be no assurance that we will be able to obtain financing on terms acceptable to us, or at all, in the future. In addition, if we do not meet our revenue targets, our use of our cash balances would increase due to the fact that a significant portion of our operating expenses are fixed. If we are not able to obtain additional financing when needed, or on acceptable terms, our ability to support our business growth, invest in additional research and development and sales and marketing, or respond to business opportunities, challenges, or other circumstances could be adversely affected, and our business may be harmed.

Our current stock price and corresponding market valuation could give rise to stockholder activism or hostile takeover attempts, which could be harmful to our business.

Because the current trading price of our common stock and aggregate market capitalization are low, there is a risk that we could face stockholder activism or hostile takeover attempts, which could divert management's attention from its strategic plan to build stockholder value through the expansion of our lighting solutions business. If the IIoT market in general, and the outdoor lighting market segment in particular, do not materialize as anticipated, if our control networking solutions and other product offerings are not accepted and utilized, or if we are subject to a hostile takeover at a depressed valuation, we may have to devote a significant amount of time and resources to address these matters without any return on our investment. This could cause us to suffer significant financial losses and could also have a negative impact on our reputation and results of operations, any of which would likely cause our stock price to decline.

Voluntary and/or industry standards and governmental regulatory actions in our markets could limit our ability to sell our products.

Standards bodies, which are formal and informal associations that attempt to set voluntary, non-governmental product standards, are influential in many of our target markets. We participate in many voluntary and/or industry standards organizations around the world in order to help prevent the adoption of exclusionary standards as well as to promote standards for our products. However, we do not have the resources to participate in all standards processes that may affect our markets, and our efforts to influence the direction of those standards bodies in which we do participate may not be successful. Many of our competitors have significantly more resources focused on standards activities and may influence those standards in a way that would be disadvantageous to our products and thereby make it difficult for us to achieve our business and financial objectives.

Many of our products and the industries in which they are used are subject to U.S. and foreign regulation. In addition, the markets for our IIoT products may experience a movement towards standards based protocols driven by governmental action, such as those being considered in the U.S. by the National Institute of Standards and Technology. To the extent that we do not adopt such protocols or do not succeed in achieving adoption of our own protocols as standards or de facto standards, sales of our IIoT products may be adversely affected. Moreover, even if our own protocols are adopted as standards, we run the risk that we could lose business to competing implementations.

The adoption of voluntary and/or industry standards or the passage of governmental regulations, for example by state utility commissions or national regulatory bodies such as Federal Energy Regulatory Commissions in the United States and PTB or BSI in Germany, that are incompatible with our products or technology could limit the market opportunity for our products or result in increased costs, which could harm our revenues, results of operations, and financial condition.

We are subject to numerous governmental regulations concerning the manufacturing and use of our products. We must stay in compliance with all such regulations and any future regulations. Any failure to comply with such regulations, and the unanticipated costs of complying with future regulations, may adversely affect our business, financial condition, and results of operations.

We manufacture and sell products incorporating electronic components that may contain materials that are subject to government regulation in the locations in which our products are manufactured and assembled, as well as the locations where we sell our products. Since we operate on a global basis, maintaining compliance with regulations concerning

the materials used in our products is a complex process that requires continual monitoring of regulations and ongoing compliance procedures. For example, in 2012 the European Union issued recast regulations regarding the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment ("RoHS"), and in 2014, the SEC rules requiring companies to publicly disclose their use of "conflict minerals" that originated in the Democratic Republic of the Congo (DRC) or an adjoining country also become effective. The adoption of any unanticipated new regulations that significantly impact the various components we use or require that we use more expensive components would have a material adverse impact on our business, financial condition and results of operations.

Our reliance on third-party manufacturers exposes us to the risk that conflict minerals that are contained in our products have originated in the DRC or an adjoining country. We have incurred and expect to incur additional costs to comply with the disclosure

requirements. Moreover, the implementation of these requirements could adversely affect the sourcing, availability and pricing of materials used in the manufacture of our products to the extent that there may be only a limited number of suppliers offering “conflict free” minerals that can be used in our products. There can be no assurance that we will be able to obtain such minerals in sufficient quantities or at competitive prices. We may also encounter customers who require that all of the components of our products be certified as conflict free. If we are not able to meet customer requirements, such customers may choose to not purchase our products, which could impact our sales.

Our manufacturing processes, including the processes used by our suppliers, are also subject to numerous governmental regulations that cover both the use of various materials as well as environmental concerns. Since we and our suppliers operate on a global basis, maintaining compliance with regulations concerning our production processes is also a complex process that requires continual monitoring of regulations and ongoing compliance procedures. For example, environmental issues such as pollution and climate change have seen significant legislative and regulatory interest on a global basis. Changes in these areas could directly increase the cost of energy, which may have an impact on the way we or our suppliers manufacture products or use energy to produce our products. In addition, any new regulations or laws in the environmental area might increase the cost of raw materials we use in our products. We are currently unable to predict how any such changes will impact us and if any such impact could be material to our business. Any new law or regulation that significantly increases our costs of manufacturing or causes us or our suppliers to significantly alter the way that our products are manufactured would have a material adverse effect on our business, financial condition and results of operations.

Liabilities resulting from defects in or misuse of our products, whether or not covered by insurance, may delay our revenues and increase our liabilities and expenses.

Our products are manufactured with highly complex electronic components and may, as a result, contain or may be alleged to contain errors or failures, including those relating to actual or potential security breaches. In addition, our customers or their installation partners may improperly install or implement our products, which could delay completion of a deployment or hinder our ability to win a subsequent award. Furthermore, because of the low cost and interoperable nature of our IIoT products, LONWORKS technology could be used in a manner for which it was not intended.

Even if we determine that an alleged error or failure in our products does not exist, we may incur significant expense and shipments and revenues may be delayed while we analyze the alleged error or failure. If errors or failures are found in our products, we may not be able to successfully correct them in a timely manner, or at all, and our reputation may suffer. Such errors or failures could delay our product shipments and divert our engineering resources while we attempt to correct them. In addition, we could decide to extend the warranty period, or incur other costs outside of our normal warranty coverage, to help address any known errors or failures in our products and mitigate the impact on our customers. For example, we could decide to replace defective products at a cost that is significantly higher than the value of the original products. This could delay our revenues and increase our expenses.

To address these issues, the agreements we maintain with our customers may contain provisions intended to limit our exposure to potential errors and omissions claims as well as any liabilities arising from them. However, our customer contracts may not effectively protect us against the liabilities and expenses associated with errors or failures attributable to our products.

Defects in our products may also cause us to be liable for losses in the event of property damage, harm or death to persons, claims against our directors or officers, and the like. For example, our outdoor lighting control products operate in a variety of settings under diverse conditions that may present the risk of product failure, which could subject us to liability. For instance, a failure of our automated smart lighting product used by a customer to enhance security could subject us to liability in the event of unlawful activity by third parties. Moreover, our IIoT products may present risks beyond our control such as operational misuse that could ultimately subject us to liability. Such liabilities could harm our reputation, expose our company to liability, and adversely affect our operating results and financial position.

To help reduce our exposure to these types of liabilities, we currently maintain property, general commercial liability, errors and omissions, directors and officers, and other lines of insurance. However, it is possible that such insurance may not be available in the future or, if available, may be insufficient in amount to cover any particular claim, or we might not carry insurance that covers a specific claim. In addition, we believe that the premiums for the types of

insurance we carry will continue to fluctuate from period to period. Significant cost increases could also result in increased premiums or reduced coverage limits. Consequently, if we elect to reduce our coverage, or if we do not carry insurance for a particular type of claim, we will face increased exposure to these types of claims.

We may be unable to realize the benefits of our net operating loss carry-forwards (“NOLs”).

NOLs may be carried forward to offset federal and state taxable income in future years and eliminate income taxes otherwise payable on such taxable income, subject to certain adjustments. Based on current federal and state corporate income tax rates, our NOLs and other carry-forwards could provide a benefit to us, if fully utilized, of significant future tax savings. However, our ability to use these tax benefits in future years will depend upon the amount of our otherwise federal and state taxable income. If we do not have sufficient federal and state taxable income in future years to use the tax benefits before they expire, we will lose the benefit of these NOLs permanently. Consequently, in addition to dependence on the generation of future business profits, our ability to use the tax benefits associated with our substantial NOLs will depend significantly on our success in identifying suitable acquisition or investment candidates, and once identified, successfully consummating an acquisition of or investment in these candidates.

Additionally, federal NOLs are subject to annual limitations under the change of ownership rules within Section 382 of the Internal Revenue Code. In general, an ownership change occurs when the percentage of stock held by one or more 5-percent shareholders increases by more than 50 percentage points over the lowest stock ownership held by such shareholders at any time within a prescribed period, usually three years. If an ownership change were to occur, we may be unable to use a significant portion of our NOLs to offset taxable income. As discussed in Note 7 to our consolidated financial statements included in our Annual Report on Form 10-K, filed with the Securities and Exchange Commission in March 2017, on April 22, 2016, the Company’s Board of Directors adopted a Tax Benefit Preservation Plan (“Tax Plan”) intended to reduce the likelihood that changes in the Company’s investor base have the unintended effect of limiting the Company’s use of its tax benefits. The Tax Plan is intended to require any person acquiring shares of the Company’s securities equal to or exceeding 4.99% of the Company’s outstanding shares to obtain the approval of the Board of Directors. This would protect the tax benefits because changes in ownership by a person owning less than 4.99% of the Company’s stock are considered and included in one or more public groups in the calculation of “ownership change” for purposes of Section 382 of the Code. However, there can be no assurance that the Tax Plan would be effective under all circumstances. Moreover, the Tax Plan, as amended on April 17, 2017, will expire on April 25, 2019, unless renewed by our Board of Directors.

The amount of NOLs that we have claimed has not been audited or otherwise validated by the U.S. Internal Revenue Service (“IRS”). The IRS could challenge our calculation of the amount of our NOLs or our determinations as to when a prior change in ownership occurred, and other provisions of the Internal Revenue Code may limit our ability to carry forward our NOLs to offset taxable income in future years. If the IRS was successful with respect to any such challenge, the potential tax benefit of the NOLs to us could be substantially reduced.

Lastly, in December 2017, the Tax Cuts and Jobs Act ("the Act") was signed into law. Among other changes is a permanent reduction in the federal U.S. corporate income tax rate from 35% to 21%, effective January 1, 2018. As a result of the change in the corporate income tax rate, the value of our NOLs has decreased.

We have limited ability to protect our intellectual property rights.

Our success depends significantly upon our intellectual property rights, which can vary significantly from jurisdiction to jurisdiction. We rely on a combination of patent, copyright, trademark and trade secret laws, non-disclosure agreements and other contractual provisions to establish, maintain and protect these intellectual property rights, all of which afford only limited protection, particularly in those countries that lack robust or accessible enforcement mechanisms. For example, we have in the past and may in the future form joint ventures with foreign companies, including those in China, where intellectual property mechanisms are generally less stringent than those found in the U.S. We have also outsourced certain development activities to third parties. If any of our patents fail to protect our technology, or if we do not obtain patents in certain countries, our competitors may find it easier to offer equivalent or superior technology. In addition, our trade secrets or other intellectual property that we license to third parties could be used improperly or otherwise in violation of the license terms.

We have also registered or applied for registration for certain trademarks, and will continue to evaluate the registration of additional trademarks as appropriate. If we fail to properly register or maintain our trademarks, or to otherwise take all necessary steps to protect our trademarks, the value associated with the trademarks may diminish. In addition, if we fail to protect our trade secrets or other intellectual property rights, we may not be able to compete as effectively in

our markets.

Despite our efforts to protect our proprietary rights, unauthorized parties may attempt to copy aspects of our products or services or use information that we regard as proprietary, or it may not be economically feasible to enforce them. Any of our patents, trademarks, copyrights, trade secrets, or intellectual property rights could be challenged, invalidated or circumvented. In addition, we cannot assure you that we have taken or will take all necessary steps to protect our intellectual property rights. Third parties may also independently develop similar technology without breach of our trade secrets or other proprietary rights. In addition, the laws of some foreign countries, including several in which we operate or sell our products, do not protect proprietary rights to as great an extent as do the laws of the United States, and it may take longer to receive a remedy from a court outside of

the United States. Also, some of our products are licensed under shrink-wrap license agreements that are not signed by licensees and therefore may not be binding under the laws of certain jurisdictions.

From time to time, litigation may be necessary to defend and enforce our proprietary rights. As a result, we could incur substantial costs and divert management resources, which could harm our business, regardless of the final outcome. Despite our efforts to safeguard and maintain our proprietary rights both in the United States and abroad, we may be unsuccessful in doing so. Also, the steps that we take to safeguard and maintain our proprietary rights may be inadequate to deter third parties from infringing, misusing, misappropriating, or independently developing our technology or intellectual property rights, or to prevent an unauthorized third party from misappropriating our products or technology.

Our business may suffer if it is alleged or found that our products infringe the intellectual property rights of others, or if we are unable to secure rights to use the intellectual property rights of others on reasonable terms.

We may be contractually obligated to indemnify our customers or other third parties that use our products in the event our products are alleged to infringe a third party's intellectual property rights. From time to time, we may also receive notice that a third party believes that our products may be infringing patents or other intellectual property rights of that third party. Responding to those claims, regardless of their merit, can be time consuming, result in costly litigation, divert management's attention and resources, and cause us to incur significant expenses. We do not insure against infringement of a third party's intellectual property rights.

As the result of such a claim, we may elect or be required to redesign our products that are alleged to infringe the third party's patents or other intellectual property rights, which could cause those product offerings to be delayed. Or we could be required to cease distributing those products altogether. In the alternative, we could seek a license to the third party's intellectual property. Even if our products do not infringe, we may elect to take a license or settle to avoid incurring litigation costs. However, it is possible that we would not be able to obtain such a license or settle on reasonable terms, or at all.

In some cases, even though no infringement has been alleged, we may attempt to secure rights to use the intellectual property rights of others that would be useful to us. We cannot guarantee that we would be able to secure such rights on reasonable terms, or at all.

Lastly, our customers may not purchase our products if they are concerned our products may infringe third party intellectual property rights. This could reduce the market opportunity for the sale of our products and services.

Any of the foregoing risks could have a material adverse effect on our revenues, results of operations, and financial condition.

We may be unable to anticipate or fail to adequately mitigate against increasingly sophisticated methods to engage in illegal or fraudulent activities against us.

Despite any defensive measures we take to manage threats to our business, our risk and exposure to these matters remain heightened because of, among other things, the evolving nature of such threats in light of advances in computer capabilities, new discoveries in the field of cryptography, new and sophisticated methods used by criminals including phishing, social engineering or other illicit acts, or other events or developments that we may be unable to anticipate or fail to adequately mitigate. These threats, events, and developments could lead to, for example, unauthorized access to or acquisition of our sensitive business information or intellectual property, or the personal data of our employees. If any such efforts against us were to be successful, we could face financial and legal liability and suffer damage to our business and reputation, any of which could have a material adverse effect on our results of operations and financial condition.

Future acquisitions, strategic investments, partnerships or alliances could be difficult to identify and integrate, divert the attention of management, disrupt our business, dilute stockholder value and adversely affect our results of operations and financial condition.

As opportunities present themselves, we may from time to time evaluate and enter into strategic partnerships or transactions involving acquisitions of or investments in other businesses, products or technologies that we believe could complement or expand our services, enhance our technical capabilities or otherwise offer growth opportunities. The pursuit of potential transactions may divert the attention of management and cause us to incur various expenses in

identifying, investigating, and pursuing suitable opportunities, whether or not transactions are ultimately completed. If we acquire businesses, we may not be able to integrate successfully the acquired personnel, operations and technologies, or effectively manage the combined business following the acquisition. We may not be able to find and identify desirable opportunities or be successful in entering into an agreement with respect to the opportunities that we do identify. Acquisitions and other transactions could also result in dilutive issuances of equity

securities, use of our existing cash reserves or the incurrence of debt. In addition, a transaction may fail to meet our expectations. The occurrence of any of these risks could harm our results of operations, business and financial condition.

Natural disasters, power outages, and other factors outside of our control such as widespread pandemics could disrupt our business.

We must protect our business and our network infrastructure against damage from earthquake, flood, hurricane and similar events, as well as from power outages. Our corporate headquarters is located in the San Francisco Bay Area, a region known for earthquakes. A natural disaster, power outage, or other unanticipated problem could also adversely affect our business by, among other things, harming our primary data center or other internal operations, limiting our ability to communicate with our customers, limiting our ability or our partners' or customers' ability to sell or use our products, affecting our third party developer's ability to complete developments on schedule or at all, or affecting our suppliers' ability to provide us with components or products. These risks bay be further increased if the disaster recover plans for us and our suppliers prove to be inadequate. For example, the 2011 earthquake and tsunami in Japan adversely impacted our revenues from customers located in Japan and/or our ability to source parts from companies located in Japan. Shortly after the earthquake, we received notice from Toshiba (one of two manufacturers of the Neuron Chip - an important component that we and our customers use in control network devices), that they would no longer be able to manufacture Neuron Chips due to earthquake damage suffered at the semiconductor manufacturing facility that produced the Neuron Chips. However, the abrupt termination of Toshiba's Neuron Chip manufacturing capability caused a disruption in supply and an increase in prices from the remaining supplier, Cypress Semiconductor. We do not insure against several natural disasters, including earthquakes.

ITEM 1B. UNRESOLVED STAFF COMMENTS

None.

ITEM 2. PROPERTIES

At our corporate headquarters in Santa Clara, California, we sublease approximately 32,000 square feet of usable space. We moved to this location in December 2015. The sublease for this space is scheduled to expire in July 2019. We also lease office space for our employees and consultants in Florida, China, Hong Kong, Japan, the Netherlands, South Korea, and the United Kingdom. The leases for these offices expire at various dates through 2018.

As of December 31, 2017, the future minimum rental payments for all of our leased office space, including those for our corporate headquarters facilities, totaled approximately $1.4 million. For the year ended December 31, 2017, the aggregate rental expense for all leased office space was approximately $929,000.

We believe that our facilities will be adequate for at least the next 12 months. For additional information regarding our obligations under property leases, please see Note 10 - Commitments and Contingencies, in the Notes to Consolidated Financial Statements included in Item 15 of Part IV of this Report.

ITEM 3. LEGAL PROCEEDINGS

For a discussion regarding our legal proceedings and matters, please refer to the "Legal Actions" section of Note 10 - Commitments and Contingencies, in the Notes to the Consolidated Financial Statements in Item 15 of Part IV of this Annual Report on Form 10-K, which is incorporated herein by reference.

ITEM 4. MINE SAFETY DISCLOSURES

Not applicable.

PART II

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

Our common stock is traded on the Nasdaq Global Market under the symbol “ELON.” We began trading on NASDAQ on July 28, 1998, the date of our initial public offering. The following table sets forth, for the quarter indicated, the high and low sales price per share of our common stock as reported on the Nasdaq Global Market. On December 7, 2015, we effected a one-for-ten reverse stock split. All share and per share information has been retroactively adjusted to reflect the stock split.

	Price Range	
Year ended December 31, 2017	High	Low
Fourth quarter	$5.81	$4.40
Third quarter	5.46	4.26
Second quarter	7.20	5.12
First quarter	6.42	4.38
Year ended December 31, 2016		
Fourth quarter	$5.50	$4.17
Third quarter	5.75	4.73
Second quarter	5.74	4.41
First quarter	6.70	4.71

As of February 28, 2018, there were approximately 119 stockholders of record. Because brokers and other institutions hold many shares on behalf of stockholders, we are unable to estimate the total number of stockholders represented by these record holders.

Dividend Policy

We have never paid dividends on our capital stock and do not currently expect to pay any dividends in the foreseeable future. We intend to retain future earnings, if any, for use in our business.

Equity Compensation Plan Summary Information

For information on our equity compensation plans, please refer to Note 6 - Stockholders' Equity and Employee Stock Option Plans, in the Notes to the Consolidated Financial Statements in Item 15 of Part IV of this Annual Report on Form 10-K.

Recent Sales of Unregistered Securities

There were no sales of unregistered securities during the fourth quarter of our fiscal year ended December 31, 2017.

Repurchase of Equity Securities by the Company

The following table provides information about the repurchase of our common stock during the quarter ended December 31, 2017:

Period	Total Number of Shares Purchased (1)	Average Price Paid per Share	Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs	Maximum Number of Shares that May Yet Be Purchased Under the Plans or Programs (1)
October 1 – October 31	—	$ —	—	—
November 1 – November 30	—	$ —	—	—
December 1 – December 31	21	$ 5.19	—	—
Total	21	$ 5.19	—	—

(1) Represents shares surrendered to us by employees in order to satisfy stock-for-stock option exercises and/or withholding tax obligations related to stock-based compensation.

ITEM 6. SELECTED FINANCIAL DATA

As a smaller reporting company, we are not required to provide the information under this item, pursuant to Regulation S-K Item 301(c).

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

The following discussion should be read in conjunction with the consolidated financial statements and notes thereto included elsewhere in this Annual Report. The following discussion contains predictions, estimates, and other forward-looking statements that involve a number of risks and uncertainties about our business. These statements may be identified by the use of words such as “we believe,” “expect,” “anticipate,” “intend,” “plan,” “goal,” “continues,” “may” and expressions. Forward-looking statements include statements that refer to projections of our future financial performance, our anticipated growth and trends in our businesses, and other characterizations of future events or circumstances. In particular, these statements include statements such as: our projections of revenues; estimates of our future gross margins and restructuring charges; statements regarding reinvesting a portion of our earnings from foreign operations; plans to use our cash reserves to strategically acquire other companies, products, or technologies; our projections of our combined cash, cash equivalent and short term investment balance; the sufficiency of our cash reserves to meet cash requirements; our expectations that our revenues will not fluctuate significantly due to a fluctuation in foreign currency sales; our forecasts regarding our sales and marketing expenses; and estimates of our interest income and tax exposure. Such statements are based on our current expectations and could be affected by the uncertainties and risk factors described throughout this filing and particularly in the “Risk Factors” section. Therefore, our actual results may differ materially and adversely from those expressed in any forward-looking statements. We undertake no obligation to review or update publicly any forward-looking statements for any reason.

EXECUTIVE OVERVIEW

Echelon Corporation was incorporated in California in February 1988 and reincorporated in Delaware in January 1989. We went public on the NASDAQ market under the symbol "ELON" in July, 1998. We are based in Santa Clara, California, and maintain offices in several foreign countries throughout Europe and Asia. Our products enable "things" in commercial and industrial applications — such as air conditioners, lighting, manufacturing equipment, electricity meters, light switches, thermostats, and valves — to be made “smart” and inter-connected, part of an emerging market known as the Industrial Internet of Things ("IIoT").

Our widely deployed, open standard, multi-vendor energy control networking platform powers applications for smart cities, smart buildings, and smart campuses that help customers save on their energy usage; prevent failure or reduce failure duration; reduce carbon footprint; improve safety, comfort, and convenience; and more. Our solutions, which feature a programmable, distributed intelligence architecture that is designed for both high reliability and fast action, are implemented over the powerline or through wireless communication systems for flexibility in installation and operation.

We offer two product lines, the first of which is comprised of chips, modules, gateways, and design and management software that enables Original Equipment Manufacturers ("OEMs") to quickly design and bring to market interoperable smart systems for their commercial and industrial customers. These products are generally marketed under the LONWORKS and IzoT brand names. We refer to revenues from these products as "embedded systems" revenues.

Our second product line is a range of control networking solutions designed specifically for the lighting market within the IIoT. As this market continues its transition to solid state lighting, or LEDs, we have focused our initial offerings on outdoor lighting control solutions, as we believe that the incremental energy savings, maintenance benefits, and safety improvements resulting from the implementation of controls offers a compelling return on investment. In addition, due to the abundance of lighting fixtures in most locations, the lighting control system can host a variety of "smart" applications that can further improve safety and comfort on roadways, in parking lots and garages, on

campuses, in tunnels, and more. Our lighting control solutions consist of wired and wireless control nodes placed at the lighting fixtures of a wide variety of manufacturers, “smart” gateways for interconnecting the control nodes, and a software-based Central Management System, or CMS, which is used for startup, commissioning, management, and monitoring of the lighting network. These solutions are sold to end users typically through manufacturers' representatives, energy services companies, and distributors, and are generally marketed under the LumInsight and Lumewave by Echelon brand names. We refer to revenues from these products as "outdoor lighting" revenues.

The following tables provide an overview of key financial metrics for the years ended December 31, 2017 and 2016 that our management team focuses on in evaluating our financial condition and operating performance (in thousands, except percentages).

	Year ended December 31,			
	2017	2016	$ Change	% Change
Net revenues	$31,667	$32,385	$(718)	(2.2)%
Gross margin	55.7%	55.8%	---	(0.1) ppt
Operating expenses	$21,804	$22,812	$(1,008)	(4.4)%
Net loss attributable to Echelon Corporation Stockholders	$(4,623)	$(4,103)	$(520)	12.7%
Cash, cash equivalents, restricted investments, and short-term investments	$20,478	$23,036	$(2,558)	(11.1)%

- Net revenues: Our total revenues decreased by 2.2% during 2017 as compared to 2016. Excluding component sales to Enel, which decreased from $1.3 million in 2016 to $0 in 2017, our revenues increased by 1.9% during 2017 as compared to 2016. This increase was primarily due to an increase in sales made to customers in the Americas and APJ regions, partially offset by a reduction in sales made to customers in the EMEA region.
- Gross margin: Our gross margins remained relatively unchanged during 2017 as compared to 2016.
- Operating expenses: Our operating expenses decreased by 4.4% during 2017 as compared to 2016. This continues a trend we began several years ago and is primarily due to reduced compensation related expenses resulting from the restructuring actions we have undertaken as well as a reduction in fees paid to some of our third party service providers.
- Net loss: We generated a net loss of $4.6 million during 2017, which was a increase from the net loss of $4.1 million in 2016. This increase was primarily the result of an increase in our foreign exchange translation losses, and was partially offset by an overall decrease in our operating expenses.
- Cash, cash equivalents, restricted investments, and short-term investments: During 2017, our cash, cash equivalents, restricted investments, and short-term investment balance decreased by 11.1%, from $23.0 million at December 31, 2016 to $20.5 million at December 31, 2017. This decrease was primarily the result of cash used in operations of $2.2 million (driven primarily by our net loss of $4.6 million less non-cash charges for depreciation and amortization, and stock based compensation).

Critical Accounting Policies and Estimates

Our discussion and analysis of our financial condition and results of operations is based upon our consolidated financial statements, which have been prepared in accordance with accounting principles generally accepted in the United States of America. Note 1, “Significant Accounting Policies” of Notes to Consolidated Financial Statements in this Annual Report on Form 10-K describes the significant accounting policies and methods used in the preparation of our consolidated financial statements. The preparation of these consolidated financial statements requires us to make estimates and judgments that affect the reported amounts of assets, liabilities, revenues and expenses and related disclosure of contingent assets and liabilities. On an on-going basis, we evaluate our estimates, including those related to our stock-based compensation, allowance for doubtful accounts, inventories, and commitments and contingencies. We base our estimates on historical experience and on various other assumptions that we believe to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities. Actual results may differ from these estimates under different assumptions or conditions.

We believe the following critical accounting policies and estimates relate to those policies that are most important to the presentation of our consolidated financial statements and require the most difficult, subjective, and complex judgments.

Revenue Recognition. Our revenues are derived from the sale and license of our products and to a lesser extent, from fees associated with training, technical support, and custom software design services offered to our customers. Product

revenues consist of revenues from hardware sales and software licensing arrangements. Service revenues consist of product technical support (including software post-contract support services), training, and custom software development services.

We recognize revenue when persuasive evidence of an arrangement exists, delivery to the customer's carrier (and acceptance, as applicable) has occurred, the sales price is fixed or determinable, collectability is probable, and there are no post-delivery obligations. For non-distributor hardware sales, including sales to third party manufacturers, these criteria are generally met at the time of delivery to the customer's carrier. However, for arrangements that contain contractual acceptance provisions, revenue recognition may be delayed until acceptance by the customer or the acceptance provisions lapse unless we can objectively demonstrate that the contractual acceptance criteria have been satisfied, which is generally accomplished by establishing a history of acceptance for the same or similar products. For sales made to our distributor partners, revenue recognition criteria are generally met at the time the distributor sells the products through to its end-use customer. Service revenue is recognized as the training services are performed, or ratably over the term of the support period.

We account for the rights of return, price protection, rebates, and other sales incentives offered to distributors of our products as a reduction in revenue. With the exception of sales to distributors, the Company's customers are generally not entitled to return products for a refund. For sales to distributors, due to contractual rights of return and other factors that impact our ability to make a reasonable estimate of future returns and other sales incentives, revenues are not recognized until the distributor has shipped our products to the end customer.

Inventory Valuation. At each balance sheet date, we evaluate our ending inventories for excess quantities and obsolescence. In general, the evaluation for excess quantities includes analyses of historical sales levels by product and projections of future demand. In general, inventories on hand in excess of one year's forecasted demand are deemed to be excess. However, in certain instances when the facts and circumstances for a particular item warrant an extended view, periods of longer than one year are used to determine excess supplies. In performing these analyses, management must make significant judgments in determining the appropriate time horizon over which to analyze for excess inventories.

For most of our products, our customers generally buy from a portfolio of “off-the-shelf” or standard products. In addition, our revenues are generally composed of a larger volume of smaller dollar transactions. Accordingly, while any single customer's demand for a given product may fluctuate from quarter to quarter, the fact that there are so many IIoT customers buying a standard product tends to average out increases or decreases in any individual customer's demand. This has historically resulted in a relatively stable future demand forecast for our IIoT products, which, absent outside forces such as worsening general economic conditions, management evaluates in determining its requirement for an excess inventory reserve.

In addition to providing a reserve for excess inventories, we do not value inventories that we consider obsolete. We consider a product to be obsolete when one of several factors exists. These factors include, but are not limited to, our decision to discontinue selling an existing product, the product has been re-designed and we are unable to rework our existing inventory to update it to the new version, or our competitors introduce new products that make our products obsolete.

We adjust remaining inventory balances to approximate the lower of our cost or net realizable value. If future demand or market conditions are less favorable than our projections, additional inventory write-downs may be required and would be reflected in cost of sales in the period the revision is made.

RESULTS OF OPERATIONS

The following discussion covers our results of operations for the two years ended December 31, 2017.

The following table reflects the percentage of total revenues represented by each item in our Consolidated Statements of Operations for the years ended December 31, 2017 and 2016:

	Year ended December 31,	
	2017	2016
Revenues	100.0 %	100.0 %
Cost of revenues	44.3	44.2
Gross profit	55.7	55.8
Operating expenses:		
Product development	29.4	25.5
Sales and marketing	17.5	19.1
General and administrative	22.0	24.9
Restructuring charges	—	0.9
Total operating expenses	68.9	70.4
Loss from operations	(13.1)	(14.6)
Interest and other income (expense), net	(1.6)	2.5
Loss before provision for income taxes	(14.7)	(12.1)
Income tax expense (benefit)	(0.1)	0.6
Net loss	(14.6)	(12.7)

Revenues

Total revenues

	Year ended December 31,			
(Dollars in thousands)	2017	2016	2017 over 2016 $ Change	2017 over 2016 % Change
Total revenues	$31,667	$32,385	(718)	(2.2)%

Our revenues are primarily comprised of sales of our hardware products, and to a lesser extent, revenues we generate from sales of our software products and from our customer support and training offerings. Included in these totals are components we sell to Enel.

Excluding sales to Enel, a related party, which are discussed more fully below, our revenues increased by 1.9%, or $595,000, during 2017 as compared to 2016. Partially offsetting this increase was a reduction in the amount of component sales we made to our former Grid division. Excluding these sales as well, our revenues grew by 6.4%, or $1.9 million, during 2017 as compared to 2016. This increase was primarily due to increases in sales made to customers in the Americas and APJ regions, which were partially offset by a reduction in sales to our customers in the EMEA region. During 2017, our embedded systems revenues grew across a broad base of customer applications, ranging from semiconductor manufacturing monitoring, to building automation, HVAC controls, and more. We believe this trend may be taking hold and working to Echelon's benefit, as companies expand into IIoT deployments and leverage LONWorks' capability.

The portion of our revenues denominated in currencies other than the United States dollar, principally the Japanese Yen, was about 4.1% in 2017 and 3.9% in 2016. Our revenues will be subject to fluctuations in the exchange rates between the United States dollar and the foreign currencies in which we sell our products and services. In general, if the dollar were to weaken against these currencies, our revenues from those foreign currency sales, when converted

into United States dollars, would increase. Conversely, if the dollar were to strengthen against these currencies, our revenues from those foreign currency sales, when converted into United States dollars, would decrease. The extent of this exchange rate fluctuation increase or decrease will depend on the amount of sales conducted in these currencies and the magnitude of the exchange rate fluctuation from year to year. To date, we have not hedged any of these foreign currency risks. We do not currently expect that, during 2018, the amount of our revenues conducted in these foreign currencies will fluctuate significantly from prior year levels. Given the historical and expected future level of sales made in foreign currencies, we do not currently plan to hedge against

these currency rate fluctuations. However, if the portion of our revenues denominated in foreign currencies were to grow significantly, we would re-evaluate these exposures and, if necessary, enter into hedging arrangements to help minimize these risks.

Enel project revenues (included in Total Revenues and Discontinued Operations)

(Dollars in thousands)	Year ended December 31, 2017	2016	2017 over 2016 $ Change	2017 over 2016 % Change
Enel revenues	—	$ 1,313	(1,313)	(100.0)%

In October 2006, we entered into a development and supply agreement with Enel. The development and supply agreement expired in March 2016. Under the development and supply agreement, Enel purchased metering kit products from us. Enel Project revenues recognized during the year ended December 31, 2016 related primarily to shipments under the development and supply agreement.

We sold our products to Enel and its designated manufacturers in U.S. dollars. Therefore, the associated revenues are not subject to foreign currency risks. We do not currently expect that there will be any additional significant shipments to Enel in 2018 and beyond.

Gross Profit and Gross Margin

(Dollars in thousands)	Year ended December 31, 2017	2016	2017 over 2016 $ Change	2017 over 2016 % Change
Gross Profit	$17,651	$18,083	(432)	(2.4)%
Gross Margin	55.7 %	55.8 %	—	(0.1)

Gross profit is equal to revenues less cost of revenues. Cost of revenues associated with sales of our IIoT products includes direct costs associated with the purchase of components, sub-assemblies, and finished goods, as well as indirect costs such as allocated labor and overhead; costs associated with the packaging, preparation, and shipment of products; and charges related to warranty and excess and obsolete inventory reserves. Cost of revenues associated with our IIoT services consists of employee-related costs such as salaries and fringe benefits as well as other direct and indirect costs incurred in providing training, customer support, and custom software development services. Gross margin is equal to gross profit divided by revenues.

Gross margins remained relatively unchanged during the year ended December 31, 2017 as compared to 2016.

Our future gross margins will continue to be affected by several factors, including, but not limited to: overall revenue levels, changes in the mix of products sold, changes in our distribution strategy and use of distributors, changes in the prices charged by our suppliers, periodic charges related to excess and obsolete inventories, warranty expenses, introductions of cost reduced versions of our products, changes in the average selling prices of the products we sell, purchase price variances, and fluctuations in the level of indirect overhead spending. In addition, the impact of foreign

exchange rate fluctuations and labor rates may affect our gross margins in the future. We currently outsource the manufacturing of most of our products requiring assembly to CEMs located primarily in China. To the extent labor rates were to rise further, or to the extent the U.S. dollar were to weaken against the Chinese currency, or other currencies used by our CEMs, our costs for the products they manufacture could rise, which would negatively affect our gross margins.

Operating Expenses

Product Development

(Dollars in thousands)	Year ended December 31, 2017	2016	2017 over 2016 $ Change	2017 over 2016 % Change
Product Development	$9,313	$8,260	1,053	12.7 %

Product development expenses consist primarily of payroll and related expenses for development personnel, facility costs, expensed material, fees paid to third party service providers, depreciation and amortization, and other costs associated with the development of new technologies and products.

Our product development expenses increased during 2017 as compared to 2016, driven primarily by increases in fees paid to third party product development service providers.

We currently expect that our product development expenses will continue to increase during the first half of 2018 as compared to 2017 as we continue to incur near-term costs associated with the roll-out of new products. We expect our product development expenses will return to more recent historical levels during the second half of 2018.

Sales and Marketing

(Dollars in thousands)	Year ended December 31, 2017	2016	2017 over 2016 $ Change	2017 over 2016 % Change
Sales and Marketing	$5,532	$6,189	(657)	(10.6)%

Sales and marketing expenses consist primarily of payroll, commissions, and related expenses for sales and marketing personnel, travel and entertainment, facilities costs, advertising and product promotion, and other costs associated with our sales and marketing activities.

Our sales and marketing expenses decreased in 2017 as compared to 2016, driven primarily by reductions in compensation related expenses for our sales and marketing personnel.

General and Administrative

(Dollars in thousands)	Year ended December 31, 2017	2016	2017 over 2016 $ Change	2017 over 2016 % Change
General and Administrative	$6,959	$8,077	(1,118)	(13.8)%

General and administrative expenses consist primarily of payroll and related expenses for executive, finance, and administrative personnel, professional fees for legal and accounting services rendered to the company, facility costs, insurance, and other general corporate expenses.

General and administrative expenses decreased in 2017 as compared to 2016 due primarily to a decrease in fees paid to third party general and administrative service providers.

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Restructuring Charges

(Dollars in thousands)	Year ended December 31, 2017	2016	2017 over 2016 $ Change	2017 over 2016 % Change
Restructuring Charges	$ —	$ 286	(286)	(100.0)%

During the fourth quarter of 2016, we undertook restructuring actions affecting approximately 7 employees to be terminated between October 2016 and November 2018, as part of an overall plan to reshape our Company for the future. In connection with this restructuring, we recorded restructuring charges of approximately $286,000 related to termination benefits for these personnel during the quarter ended December 31, 2016.

Interest and Other Income (Expense), Net

(Dollars in thousands)	Year ended December 31, 2017	2016	2017 over 2016 $ Change	2017 over 2016 % Change
Interest and Other Income (Expense), Net	$(498)	$808	(1,306)	(161.6)%

Interest and other income (expense), net primarily reflects interest earned by our company on cash and short-term investment balances as well as foreign exchange translation gains and losses related to short-term intercompany balances.

Interest and other expense, net increased by $1.3 million during 2017 as compared to the same period in 2016. This increase was primarily attributable to a $1.4M increase in foreign currency remeasurement losses during 2017 as compared to 2016. These foreign currency fluctuations are attributable to our foreign currency denominated short-term intercompany balances. We account for translation gains and losses associated with these balances by reflecting these amounts as either other income or loss in our consolidated statements of operations. During periods when the U.S. dollar weakens in value against these foreign currencies the associated translation losses negatively impact other income. Conversely, when the U.S. dollar strengthens, the resulting translation gains favorably impact other income.

We do not currently anticipate interest income on our investment portfolio will improve during 2018 as we expect interest rates to remain historically low. Future gains or losses associated with remeasuring our foreign currency denominated short-term intercompany balances will depend on the intercompany account balances as well as exchange rates in effect at the time of translation.

Income Tax Expense / Benefit

(Dollars in thousands)	Year ended December 31, 2017	2016	2017 over 2016	2017 over 2016

	$ Change	% Change
Income Tax Expense / (Benefit)	$(28)	$182 (210) (115.4)%

The income tax expense (benefit) for the years ended December 31, 2017 and 2016 was $(28,000) and $182,000, respectively. The difference between the statutory rate and our effective tax rate is primarily due to the impact of foreign taxes, changes in the valuation allowance on deferred tax assets, and changes in the accruals related to unrecognized tax benefits.

OFF-BALANCE-SHEET ARRANGEMENTS AND OTHER CONTRACTUAL OBLIGATIONS

Off-Balance-Sheet Arrangements. We have not entered into any transactions with unconsolidated entities whereby we have financial guarantees, subordinated retained interests, derivative instruments, or other contingent arrangements that expose our

company to material continuing risks, contingent liabilities, or any other obligation under a variable interest in an unconsolidated entity that provides financing, liquidity, market risk, or credit risk support to us.

Lease Commitments. In September 2015, we entered into a lease agreement for our corporate headquarters facility in Santa Clara, California. This lease commenced in November 2015 and will expire in July 2019. In addition, we lease facilities under operating leases for our sales, marketing, and product development personnel located elsewhere within the United States and in several foreign countries throughout Europe and Asia. These operating leases expire on various dates through 2019, and in some instances are cancelable with advance notice. Lastly, we also lease certain equipment and, for some of our sales personnel, automobiles. These operating leases are generally less than five years in duration.

Purchase Commitments. We utilize several contract manufacturers who manufacture and test our products requiring assembly. These contract manufacturers acquire components and build product based on demand information supplied by us in the form of purchase orders and demand forecasts. These purchase orders and demand forecasts generally cover periods up to twelve months, and in rare cases, up to eighteen months. We also obtain individual components for our products from a wide variety of individual suppliers. We generally acquire these components through the issuance of purchase orders, and in some cases through demand forecasts, both of which cover periods up to twelve months.

We also utilize purchase orders when procuring capital equipment, supplies, and services necessary for our day-to-day operations. These purchase orders generally cover periods ranging up to twelve months, but in some instances cover a longer duration.

Indemnifications. In the normal course of business, we provide indemnifications of varying scope to customers against claims of intellectual property infringement made by third parties arising from the use of our products. Historically, costs related to these indemnification provisions have not been significant. However, we are unable to estimate the maximum potential impact of these indemnification provisions on our future results of operations.

As permitted under Delaware law, we have agreements whereby we indemnify our officers and directors for certain events or occurrences while the officer or director is, or was, serving at our request in such capacity. The indemnification period covers all pertinent events and occurrences during the officer's or director's lifetime. The maximum potential amount of future payments we could be required to make under these indemnification agreements is unlimited; however, we have director and officer insurance coverage that would enable us to recover a portion of any future amounts paid. We believe the estimated fair value of these indemnification agreements in excess of the applicable insurance coverage is minimal.

Royalties. We have certain royalty commitments associated with the shipment and licensing of certain products. Royalty expense is generally based on a U.S. dollar amount per unit shipped or a percentage of the underlying revenue. Royalty expense, which is recorded as a component of cost of revenues in our Consolidated Statements of Operations, was approximately $260,000 and $264,000 for the years ended December 31, 2017 and 2016, respectively.

We will continue to be obligated for royalty payments in the future associated with the shipment and licensing of certain of our products. While we are currently unable to estimate the maximum amount of these future royalties, such amounts will continue to be dependent on the number of units shipped or the amount of revenue generated from these products.

Taxes. We conduct our operations in many tax jurisdictions throughout the world. In many of these jurisdictions, non-income based taxes such as property taxes, sales and use taxes, and value-added taxes are assessed on Echelon's operations in that particular location. While we strive to ensure compliance with these various non-income based tax filing requirements, there have been instances where potential non-compliance exposures have been identified. In accordance with generally accepted accounting principles, we make a provision for these exposures when it is both probable that a liability has been incurred and the amount of the exposure can be reasonably estimated. To date, such provisions have been immaterial, and we believe that, as of December 31, 2017, we have adequately provided for such contingencies. However, it is possible that our results of operations, cash flows, and financial position could be harmed if one or more non-compliance tax exposures are asserted by any of the jurisdictions where we conduct our operations.

Legal Actions. From time to time, in the ordinary course of business, we may be subject to other legal proceedings, claims, investigations, and other proceedings, including claims of alleged infringement of third-party patents and other intellectual property rights, and commercial, employment, and other matters. In accordance with generally accepted accounting principles, we make a provision for a liability when it is both probable that a liability has been incurred and the amount of the loss can be reasonably estimated. These provisions are reviewed at least quarterly and adjusted to reflect the impacts of negotiations, settlements, rulings, advice of legal counsel, and other information and events pertaining to a particular case. While we believe

we have adequately provided for such contingencies as of December 31, 2017, the amounts of which were immaterial, it is possible that our results of operations, cash flows, and financial position could be harmed by the resolution of any such outstanding claims.

LIQUIDITY AND CAPITAL RESOURCES

Since our inception, we have financed our operations and met our capital expenditure requirements primarily from the sale of preferred stock and common stock, although during 2012 and certain earlier years, we were also able to finance our operations through operating cash flow.

The following table presents selected financial information as of December 31, 2017 and 2016 (dollars in thousands):

	December 31,	
	2017	2016
Cash, cash equivalents, restricted investments, and short-term investments	$20,478	$23,036
Trade accounts receivable, net	2,721	3,015
Working capital	20,369	23,083
Stockholders' equity	$21,887	$24,678

As of December 31, 2017, we had $20.5 million in cash, cash equivalents, restricted investments, and short-term investments, a decrease of $2.6 million as compared to December 31, 2016. Historically, our primary source of cash, other than stock sales, has been receipts from revenue, and to a lesser extent, proceeds from the exercise of stock options and warrants by our employees and directors. Our primary uses of cash have been cost of product revenue, payroll (salaries, commissions, bonuses, and benefits), general operating expenses (costs associated with our offices such as rent, utilities, and maintenance; fees paid to third party service providers such as consultants, accountants, and attorneys; travel and entertainment; equipment and supplies; advertising; and other miscellaneous expenses), acquisitions, capital expenditures, payment of taxes associated with certain equity compensation awards, purchases under our stock repurchase programs, and early termination charges associated with our operating leases.

Cash flows from operating activities. Cash flows from operating activities have historically been driven by net income (loss) levels; adjustments for non-cash charges such as impairment charges, write-downs of property, plant, and equipment, stock-based compensation, depreciation and amortization, and changes in accrued investment income; and fluctuations in operating asset and liability balances. Net cash used in operating activities was $2.2 million for the year ended December 31, 2017, a decrease in cash outflows of approximately $798,000 as compared to 2016. During the year ended December 31, 2017, net cash used in operating activities was primarily the result of our net loss of $4.6 million, which was partially offset by stock-based compensation expenses of $1.5 million, depreciation and amortization expense of $454,000, and changes in our operating assets and liabilities of $600,000. The primary components of the $600,000 net change in our operating assets and liabilities were a $1.0 million increase in deferred revenues, a $586,000 increase in accounts payable, and a $367,000 decrease in accounts receivable; all of which was partially offset by a $681,000 increase in inventories and a $628,000 increase in deferred cost of goods sold. Deferred revenue and deferred cost of goods sold increased due to the fact that, as of December 31, 2017, not all of the required revenue recognition criteria had been met for certain of our outdoor lighting projects, and to a lesser extent, due to the timing of sales made to our distributor partners. Account payable increased due to the timing of expenditures during the latter part of 2017. Accounts receivable decreased based on the timing of shipments in the fourth quarter of 2017. Inventories increased in anticipation of shipments we were required to make in early 2018.

Net cash used in operating activities was $3.0 million for the year ended December 31, 2016, a decrease in cash outflows of approximately $1.9 million as compared to 2015. During the year ended December 31, 2016, net cash used in operating activities was primarily the result of our net loss of $4.1 million and a reduction in the amount of contingent consideration we owed the former Lumewave shareholders; all of which was partially offset by stock-based compensation expenses of $746,000, depreciation and amortization expense of $489,000, and changes in our operating assets and liabilities of $199,000. The primary components of the $199,000 net change in our operating assets and liabilities were a $1.0 million increase in accounts receivable, a $340,000 increase in deferred revenues, a $323,000 decrease in inventories, and a $200,000 decrease in other current assets; all of which was partially offset by a $1.2 million decrease in accrued liabilities and an $558,000 decrease in accounts payable. Accounts receivable

increased based on the timing of shipments in the fourth quarter of 2016. Deferred revenues and deferred cost of goods sold increased due primarily to the timing of sales to our distributors. Inventories decreased as part of an ongoing effort to reduce inventory levels. Other current assets decreased primarily as a result of a reduction in prepaid expenses and the refund of the deposit on our old headquarters building in San Jose. Accrued liabilities decreased primarily due to the payment of bonuses that were accrued as of December 31, 2015 and the reversal of contingent

consideration owed to the former Lumewave shareholders. Accounts payable decreased due to the timing of expenditures during the latter part of 2016.

Cash flows from investing activities. Cash flows from investing activities have historically been driven by transactions involving our short-term investment portfolio, capital expenditures, changes in our long-term assets, and acquisitions and divestitures. Net cash used in investing activities was $182,000 for the year ended December 31, 2017, an increase of $5.4 million in cash outflows compared to 2016. During the year ended December 31, 2017, net cash used investing activities was primarily the result of purchases of available-for-sale short-term investments of $23.9 million, capital expenditures of $209,000, and changes in other long-term assets of $98,000; all of which was partially offset by proceeds from the maturities of available-for-sale short-term investments of $24.0 million.

Net cash provided by investing activities was $5.2 million for the year ended December 31, 2016, a decrease of $5.5 million in cash inflows compared to 2015. During the year ended December 31, 2016, net cash provided by investing activities was primarily the result of proceeds from the maturities of available-for-sale short-term investments of $29.2 million; partially offset by purchases of available-for-sale short-term investments of $24.0 million, changes in other long-term assets of $160,000, and capital expenditures of $117,000. Other long-term assets decreased primarily due to the refund of a deposit associated with a performance bond we maintained for European VAT purposes.

Cash flows from financing activities. Cash flows from financing activities have historically been driven by the proceeds from issuance of common and preferred stock offset by transactions under our stock repurchase programs, principal payments on our lease financing obligations, and the acquisition of restricted investments. Net cash used in financing activities was $240,000 for the year ended December 31, 2017, a increase in outflows of $197,000 as compared to the same period in 2016. During the