

CERAGON NETWORKS LTD

Form 20-F

April 01, 2019

As filed with the Securities and Exchange Commission on March 31, 2019

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UNITED STATES

SECURITIES AND EXCHANGE COMMISSION

WASHINGTON, D.C. 20549

FORM 20-F

REGISTRATION STATEMENT PURSUANT TO SECTION 12(b) OR (g) OF THE SECURITIES EXCHANGE ACT OF 1934

OR

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

For the fiscal year ended December 31, 2018

OR

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

OR

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

For the transition period from \_\_\_\_\_ to \_\_\_\_\_

Commission file number 0-30862

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CERAGON NETWORKS LTD.

(Exact Name of Registrant as Specified in Its Charter)

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Israel

(Jurisdiction of Incorporation or Organization)

24 Raoul Wallenberg Street, Tel Aviv 69719, Israel

(Address of Principal Executive Offices)

Michal Lavee Machlav (+972) 3-543-1284 (tel.), (+972) 3-543-1600 (fax), 24 Raoul Wallenberg Street, Tel Aviv 69719, Israel

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(Name, Telephone, E-mail and/or Facsimile Number and Address of Company Contact Person)

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

<u>Title of Each Class</u>	<u>Name of Exchange of Which Registered</u>
Ordinary Shares, Par Value NIS 0.01	Nasdaq Global Select Market

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

Securities for which there is a reporting obligation pursuant to Section 15(d) of the Act: None

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Indicate the number of outstanding shares of each of the issuer's classes of capital or common stock as of the close of the period covered by the annual report 80,089,658 Ordinary Shares, NIS 0.01 par value.

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act.

Yes          No

If this report is an annual or transition report, indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934.

Yes          No

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          No

Indicate by check mark whether the registrant has submitted electronically, every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (Section 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files).

Yes          No

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

Large accelerated filer

Accelerated filer

Non-accelerated filer

Emerging growth company

If an emerging growth company that prepares its financial statements in accordance with U.S. GAAP, 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 which basis of accounting the registrant has used to prepare the financial statements included in this filing:

U.S. GAAP

International Financial Reporting Standards as issued by the International Accounting Standards Board

Other

If "Other" has been checked in response to the previous question, indicate by check mark which financial statement item the registrant has elected to follow.

Item 17

Item 18

If this is an annual report, indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act).

Yes      No

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## INTRODUCTION

### Definitions

In this annual report, unless the context otherwise requires:

- references to “Ceragon,” the “Company,” “us,” “we” “our” and the “registrant” refer to Ceragon Networks Ltd., an Israeli company, and its consolidated subsidiaries;
- references to “ordinary shares,” “our shares” and similar expressions refer to our Ordinary Shares, NIS 0.01 nominal (par value per share);
- references to “dollars,” “U.S. dollars” and “\$” are to United States Dollars;
- references to “shekels” and “NIS” are to New Israeli Shekels, the Israeli currency;
- references to the “Companies Law” are to Israel’s Companies Law, 5759-1999;
- references to the “SEC” are to the United States Securities and Exchange Commission; and
- references to the "Nasdaq Rules" are to the rules of the Nasdaq Global Select Market.

### Cautionary Statement Regarding Forward-Looking Statements

This annual report includes certain statements that are intended to be, and are hereby identified as, “forward-looking statements” for the purposes of the safe harbor provisions of the Private Securities Litigation Reform Act of 1995. We have based these forward-looking statements on our current expectations and projections about future events.

Forward-looking statements can be identified by the use of forward-looking terminology such as “may,” “will,” “expect,” “anticipate,” “estimate,” “continue,” “believe” or other similar expressions, but are not the only way these statements are identified. These statements discuss future expectations, plans and events, contain projections of results of operations or of financial condition or state other “forward-looking” information. When a forward-looking statement includes an underlying assumption, we caution that, while we believe the assumption to be reasonable and make it in good faith, assumed facts almost always vary from actual results, and the difference between a forward-looking statement and actual results can be material. Forward-looking statements may be found in Item 4. “INFORMATION ON THE COMPANY” and Item 5. “OPERATING AND FINANCIAL REVIEW AND PROSPECTS” and in this annual report generally. Our actual results could differ materially from those anticipated in these statements as a result of various factors, including all the risks discussed in “Risk Factors” and other cautionary statements in this annual report. All of our forward-looking statements are qualified by and should be read in conjunction with those disclosures. Except as may be required by applicable law, we undertake no obligation to publicly update or revise any forward-looking statements, whether as a result of new information, future events or otherwise. In light of these risks, uncertainties, and assumptions, the forward-looking events discussed in this annual report might not occur.

## PART I

### ITEM 1. IDENTITY OF DIRECTORS, SENIOR MANAGEMENT AND ADVISERS

Not applicable.

### ITEM 2. OFFER STATISTICS AND EXPECTED TIMETABLE

Not applicable.

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## ITEM 3. KEY INFORMATION

## Selected Consolidated Financial Data

The selected financial data set forth in the table below have been derived from our audited historical financial statements for each of the years from 2014 to 2018. The selected consolidated statement of operations data for the years 2016, 2017 and 2018, and the selected consolidated balance sheet data at December 31, 2017 and 2018, have been derived from our audited consolidated financial statements set forth in Item 18. "FINANCIAL STATEMENTS." The selected consolidated statement of operations data for the years 2014 and 2015 and the selected consolidated balance sheet data at December 31, 2014, 2015 and 2016, have been derived from our previously published audited consolidated financial statements, which are not included in this annual report. This selected financial data should be read in conjunction with our consolidated financial statements and are qualified entirely by reference to such consolidated financial statements. We prepare our consolidated financial statements in U.S. dollars and in accordance with United States Generally Accepted Accounting Principles ("U.S. GAAP"). You should read the consolidated financial data with the section of this annual report entitled Item 5. "OPERATING AND FINANCIAL REVIEW AND PROSPECTS" and our consolidated financial statements and the notes to those financial statements included elsewhere in this annual report.

Consolidated Statement of Operations Data:	Year ended December 31,				
	2014	2015	2016	2017	2018
	(In thousands of dollars, except share and per share data)				
Revenues	371,112	349,435	293,641	332,033	343,874
Cost of revenues	286,670	246,487	194,479	224,698	227,705
Gross profit	84,442	102,948	99,162	107,335	116,169
Operating expenses:					
Research and development, net	35,004	22,930	21,695	25,703	28,180
Selling and marketing	56,059	40,816	39,515	41,656	42,961
General and administrative	23,657	21,235	20,380	18,576	19,354
Restructuring costs	6,816	1,225	-	-	-
Goodwill impairment	14,765	-	-	-	-
Other income	(19,827)	(4,849)	(1,921)	(1,746)	(470)
Total operating expenses	116,474	81,357	79,669	84,189	90,025
Operating income (loss)	(32,032)	21,591	19,493	23,146	26,144
Financial expenses, net	(37,946)	(14,738)	(6,303)	(5,889)	(6,349)
Income (loss) before taxes	(69,978)	6,853	13,190	17,257	19,795
Tax benefit (taxes) on income	(6,501)	(5,842)	(1,761)	(1,697)	3,251
Net income (loss)	(76,479)	1,011	11,429	15,560	23,046
Basic net earnings (loss) per share	\$(1.22)	\$0.01	\$0.15	\$0.20	\$0.29
Diluted net earnings (loss) per share	\$(1.22)	\$0.01	\$0.15	\$0.19	\$0.28
Weighted average number of shares used in computing basic earnings (loss) per share	62,518,602	77,239,409	77,702,788	77,916,912	78,579,013
Weighted average number of shares used in computing diluted earnings (loss) per share	62,518,602	77,296,681	78,613,528	79,942,353	81,021,527



Year ended December 31,  
2014      2015      2016      2017      2018  
(In thousands of dollars)

## Consolidated Balance Sheet Data:

Cash and cash equivalents, bank deposits, short and long term marketable securities	42,371	36,318	36,338	26,873	36,600
Working capital	87,748	81,957	95,950	105,362	115,170
Total assets	341,873	267,249	244,225	253,593	283,000
Total long term liabilities	31,822	19,915	17,555	14,245	13,411
Shareholders' equity	104,552	102,821	116,164	133,898	159,568

## Risk Factors

The following risk factors, among others, could affect our business, results of operations or financial condition and cause our actual results to differ materially from those expressed in forward-looking statements made by us. These forward-looking statements are based on current expectations and we assume no obligation to update this information. You should carefully consider the risks described below, in addition to the other information contained elsewhere in this annual report. The following risk factors are not the only risk factors that the Company faces, and as such, additional unknown risks and uncertainties that we currently deem immaterial may also affect our business. Our business, financial condition and results of operations could be seriously harmed if any of the events underlying any of these risks or uncertainties actually occur. In such an event, the market price for our ordinary shares could decline.

## Risks Relating to Our Business

A significant portion of our business concentrates in certain regions and particularly in India, where two customers represent a significant portion of our revenues. Such concentration may negatively affect our business, financial condition and results of operations, should the amount of business coming from these regions and more specifically from these two customers, decrease or cease.

In 2018, approximately 37.0% of our total revenues came from two customers in India. In 2016 and 2017, approximately 24.2% and 37.9%, respectively, of our total revenues came from these two customers. Our sales are mostly generated from standard purchase orders rather than long-term contracts. Accordingly, these large customers are not obligated to purchase from us a fixed amount of products or services over any period of time, and may terminate or reduce their purchases from us at any time without prior notice or penalty. We therefore have difficulty projecting future revenues from these customers. The loss of these customers or any material reduction in orders from them, in the absence of gaining new significant customers replacing them, could adversely affect various aspects of our results of operations, including our cash flow and financial condition. In addition, the difficulty to project future revenues from these customers, could have, and has had in the past, an adverse effect on our ability to report future revenues, profitability and cash flow.

Furthermore, the concentration of business in specific geographic regions creates certain risks should certain events occur in these regions, such as a slowdown in investments and expansion of communication networks due to the cyclical characteristic of the investment in this industry, as well as changes in local legislation, changes in governmental controls and regulations (including those specifically related to the communication industry), changes in tariffs and taxes, trade restrictions, or a downturn in economic or financial conditions. Also, an outbreak of hostilities, political or economic instability, as well as any other extraordinary events having an adverse effect on the economy or business environment in this region, may harm the operations of our customers in these regions, and result in a significant decline of business coming from that region. We have experienced the impact of some of these risks in India as well as in Africa and in Latin America in previous years, and further realization of any of these or other risks could result in a material reduction in orders and could adversely affect our results of operations, including cash flow, and our financial condition.

We sell a single family of products and have been focusing on the “best-of-breed” segment of the wireless backhaul market, which we believe has the most profit potential. Selling a single family of products and focusing on one segment of the market, may result in sensitivity to the changes in demand for this segment. If this segment of the market should experience decline in demand it would likely negatively affect our business, financial condition and results of operations.

We mainly attribute our improvement in profitability to the continued implementation of our business strategy, a key element of which is the focus on the “best-of-breed” segment of the wireless backhaul market. However, while focusing on this one market segment led in 2017 and 2018 to a growth in sales, in 2016 and 2015 it led to a decline in sales. Hence, if this segment of the market enters into a negative cycle, or our share in it shrinks, our sales and revenues may decline, and our results of operations and cash flow may be significantly and adversely affected. In such a case, we may need to take cost reduction measures, which may adversely impact our research and development, operations, marketing and sales activities and our ability to effectively compete in the market.

Moreover, we develop and sell one product line, characterized as point-to-point wireless backhaul, into this “best-of-breed” market. As a result, we are more likely to be adversely affected by a reduction in demand for point-to-point wireless backhaul products in comparison to companies that also sell multiple and diversified product lines and solutions to customers. If technologies or market conditions change, resulting in a decreased demand for our specific technology, it could have a material adverse effect on our business, financial results and financial condition as we attempt to address these issues.

We face intense competition from other wireless backhaul equipment providers. If we fail to compete effectively, our business, financial condition and result of operations would be materially adversely affected.

The market for wireless backhaul equipment is rapidly evolving, highly competitive and subject to rapid changes.

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Our primary competitors include companies such as Huawei Technologies Co., Ltd., L.M. Ericsson Telephone Company, NEC Corporation, Nokia and ZTE Corporation, commonly referred to as “generalists”, each providing a vast wireless solutions portfolio, which includes a wireless backhaul solution within their portfolio. These generalists may also compete with us on “best-of-breed” projects, in which operators invest resources and efforts to select the best wireless backhaul solution. In addition to these primary competitors, a number of smaller wireless backhaul specialists, including Aviat Networks Inc. SIAE Microelettronica S.p.A. and Intracom Telecom, offer, or are developing, competing products.

In addition, the industry generalists are substantially larger than us, have longer operating histories and possess greater financial, sales, service, marketing, distribution, technical, manufacturing and other resources. These generalists have greater name recognition, a larger customer base and may be able to respond more quickly to changes in customer requirements and evolving industry standards.

Many of these generalists also have well-established relationships with our current and potential customers and have extensive knowledge of our target markets, which may possibly give them additional competitive advantages. In addition, as these generalists focus more on selling services and bundling the entire network as a full-package offering, some of our customers, which seek “best-of-breed” solutions like ours, may prefer to purchase “bundled” solutions from the generalists. Moreover, as these generalists are usually financially stronger than us, they may be able to offer customers more attractive pricing and payment terms, which may increase the appeal of their products in comparison to ours.

Moreover, in an effort to further grow our business, we may also sell our innovative Systems-on-Chip (SoC), which we use within our products, to some of our larger competitors, with full or limited access to our technology capabilities, over which they may design products that more effectively compete with our own.

Furthermore, the market for wireless backhaul equipment is expected to go through significant consolidation; current and potential competitors may make strategic moves such as mergers, acquisitions or establishing cooperative relationships among themselves or with third parties that may allow them to increase their market share and competitive position.

We expect to face increasing competitive pressures in the future. If we are unable to compete effectively, our business, financial condition and results of operations would be materially adversely affected. For more information on the “best-of-breed” market, please refer to Item 4. INFORMATION ON THE COMPANY; B. Business Overview – “Wireless Backhaul; Short-haul, Long-haul and Small Cells Backhaul.”

It is difficult to predict our gross margin as it is exposed to significant fluctuations as a result of potential changes in the geographical mix of our revenues.

Our revenues are derived from multiple regions, each of which may consist of a number of countries. Gross margin percentages may vary significantly between different regions and even among different countries within the same region. A significant change in the actual ratio of our revenues among the different regions/countries, whereby the actual ratio of revenues from a higher gross margin region/country exceeds our expectations, may cause our gross margin to significantly increase, while in case the actual ratio of revenues from a lower gross-margin region/country exceeds our expectations, our gross-margin may significantly decrease.

Our operating results may vary significantly from quarter to quarter and from our expectations for any specific period.

Our quarterly results are difficult to predict and may vary significantly from quarter to quarter, or from our expectations and guidance for any specific period. Most importantly, delays in product delivery or completion of related services can cause our revenues, net income and operating cash flow to deviate significantly from anticipated levels, especially as a large portion of our revenues are traditionally generated towards the end of each quarter.

Factors such as geographical mix, delivery terms and timeline(s), product mix, related services mix and other deal terms may differ significantly from our expectations, and thus impact our revenue recognition timing, gross margins, costs and expenses, as well as cash flow from operations. In addition, the spending decisions of our customers throughout the year may also create unpredictable fluctuations in the timing in which we receive orders and can recognize revenues, which may impact our quarterly results. Such unpredictable fluctuations could be material in cases where these spending decisions are made by our largest customers or regarding significant deals. In addition, the quarterly variation of our operating results may in turn create volatility in the market price for our shares.

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Merger and acquisition activities expose us to risks and liabilities, which could also result in integration problems and adversely affect our business.

We continue to explore potential merger and acquisition opportunities within our wireless backhaul market or as a diversification effort in order to implement a growth strategy. In addition, we also explore merger and acquisition opportunities aimed at obtaining technological improvement of our products and adding new technologies to our products. However, we are unable to predict whether or when any prospective deals will be completed.

These strategic transactions involve numerous risks, which can jeopardize or even eliminate the benefits entailed in such transactions, such as:

- the process of integrating an acquired business including, for example, the operations, systems, technologies, products, and personnel of the combined companies, particularly companies with large and widespread operations and/or complex products, may be prolonged due to unforeseen difficulties;

- the implementation of the transaction may distract and divert management's attention from the normal daily operations of our business;

- there will be increased expenses associated with the transaction, we may need to use a substantial portion of our cash resources or incur debt in order to cover such expenses; expenses which the combined revenues of the merged companies may not be sufficient to offset;

- we may generate negative cash flow as a result of such transaction, which may require fund raising that will not be available for us;

- we may incur unexpected accounting and other expenses associated with the transaction, such as tax expenses, write-offs, amortization expenses related to intangible assets, restructuring costs, litigation costs or such other costs derived from the acquisition;

- the transaction may harm our business as currently conducted (for example, there may be a temporary loss of revenues, we may experience loss of current key employees, customers, resellers, vendors and other business partners or companies with whom we engage today or which relate to any acquired company);

- we may be required to issue ordinary shares as part of the transaction, which would dilute our current shareholders;

- we may need to assume material liabilities of the merged entity;

- the failure to successfully complete the integration associated with the transaction (including integrating any acquired technology into our products), which may cause new markets we were aiming for not to materialize or in which competitors may have a stronger market position; or

- we may fail to effectively obtain the technological improvement.

Failure to manage and successfully complete a strategic transaction could materially harm our business operating results and cash flow. As a result, the anticipated benefits and cost savings of such mergers and acquisitions or other restructuring activities may not be fully realized, or at all, or may take longer to realize than expected. Acquisitions involve numerous risks, any of which could harm our business, results of operations cash flow and financial condition as well as the price of our ordinary shares.

Equity investment activities expose us to risks, which could also result in losses and adversely affect our financial results

We have invested and may continue to invest in the future, in equity of companies that have technologies, which fit our technological requirements and our business strategy. This investment may include - in addition to an investment in equity - loans, procurement of licenses and usage rights, buying certain development services from these companies and more. If these investments are unsuccessful, or if these companies are unsuccessful and become insolvent, we may record significant losses, which may adversely affect our financial results.

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We experience high-volatility in the supply needs of our customers, which from time to time lead to delivery pressures. If we fail to effectively cope with such volatility and growing supply demands of our customers, we may be unable to timely fulfill our customer commitments, which would adversely affect our business and results of operations.

The delivery requirements of our customers are unevenly spread throughout the year. We may receive very large orders that were not forecasted, or that were expected with a different timing requirement. In addition, we offer our customers a wide variety of products and configurations, and our inability to forecast the quantities or mix of the delivery demands for our products may result in underestimating our material purchasing needs, as well as production capacity requirements. If we fail to effectively manage our deliveries to the customers in a timely manner, or otherwise fulfill our contractual obligations to them - for example if we are unable to synchronize our supply chain and production process in cases of rapidly increasing production needs - the cost of our material purchasing, manufacturing and logistics may increase and we may also be obligated to pay penalties to our customers for delays, all of which would adversely affect our business, financial results and our relationship with our customers.

We may need to raise additional funds in the future and to the extent any such funding will be based on sales under shelf registration statements, our existing shareholders will experience dilution of their shareholdings.

Although since 2015 we have a positive cash flow, we may require additional cash, among other things, if we engage in merger and acquisition transactions. These funds may be obtained through bank loans, or by offering shares of the Company for sale. On April 7, 2017, we filed a shelf registration statement on Form F-3 with the SEC, under which we are able to offer and sell from time to time, in one or more offerings, our ordinary shares, rights, warrants, debt securities and units comprising any combination of these securities (the "Securities"), which has an aggregate offering price of up to \$150 million (the "2017 Shelf"). To date, we have not offered any Securities under the 2017 Shelf. While there is no assurance that we will sell any Securities, including shares underlying securities convertible into, exchangeable for, or exercisable for shares, under the 2017 Shelf, any such sale in the future will result in dilution to existing shareholders.

We may encounter technical difficulties as we introduce new products or new versions of existing products into the market, which could impair our ability to fulfill our commitments to our customers in a timely manner and negatively impact our business and results of operations.

In our competitive market, we launch new versions of existing products and new products from time to time. New products and new versions of existing products are more prone to technical problems which, may, among other things, adversely affect our ramping up ability and our ability to meet delivery commitments to our customers in a timely manner, and may cause us to incur additional manufacturing, development and repair costs. This may have a material adverse effect on our business and results of operation.

We are engaged in supplying installation or rollout projects for our customers. Such long-term projects have inherent additional risks. Problems in executing these rollout projects, including delays or failures in acceptance testing procedures and other items beyond our control, could have a material adverse effect on our results of operations.

In an increased number of our projects, we are engaged in supplying such products as total rollout projects, which include installation and other services for our customers. In this context, we may act as the prime contractor and equipment supplier for network build-out projects, providing installation, supervision and commissioning services required for these projects, or we may provide such services and equipment for projects handled by system integrators. As we engage in more rollout projects, we expect to continue to routinely enter into contracts involving significant amounts to be paid by our customers over time and which often require us to deliver products and services representing an important portion of the contract price before receiving any significant payment from the customer.



Once a purchase agreement has been executed, the timing and amount of revenue, if applicable, may remain difficult to predict. The completion of the installation and testing of the customer's networks and the completion of all other suppliers' network elements are subject to the customer's timing and efforts, and other factors outside our control, such as site readiness for installation or availability of power and access to sites, which may prevent us from making predictions of revenue with any certainty.

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Also, as we usually engage third party service providers and temporary employees to perform a significant part of the work, we are dependent on such service providers' and temporary employees' timely and quality performance, as well as pricing that may fluctuate significantly due to various factors. All these factors may affect our ability to accurately project our costs and profits in providing these services and may result in significant deviations from our projections, which may adversely affect our financial results. In addition, these types of projects could cause us to experience substantial period-to-period fluctuations in our results of operations and financial condition.

In some of these projects, we may need to provide bank guarantees to ensure successful completion of the rollout services or to secure an advance payment we have received, in case we fail to meet our obligations. In certain unique cases, we may even be inclined to provide such guarantees to ensure our partner's obligations towards the customer, as we have done for example in a project of the Peruvian Government. As a result, in these projects we assume greater financial risk. In addition, these types of projects could cause us to experience substantial period-to-period fluctuations in our results of operations and financial condition.

In addition, typically in rollout projects, we are dependent on the customer to issue acceptance certificates to generate and recognize revenue. In such projects, we bear the risks of loss and damage to our products until the customer has issued an acceptance certificate upon successful completion of acceptance tests. Moreover, we are not always the prime integrator in these projects and in such cases, the acceptance may be delayed even further since it depends on the acceptance of other network elements not in our control. The early deployment of our products during a long-term project reduces our cash flow, as we generally collect a significant portion of the contract price after successful completion of an acceptance test. If our products are damaged or stolen, if the network we install does not pass the acceptance tests or if the customer does not or will not issue an acceptance certificate, the end user or the system integrator could refuse to pay us any balance owed and we would incur substantial costs, including fees owed to our installation subcontractors, increased insurance premiums, transportation costs and expenses related to repairing or manufacturing the products. Moreover, in such a case, we may not be able to repossess the equipment, thus suffering additional losses.

If any of the above occurs, we may not be able to generate or recognize revenue and we may incur additional costs, any of which could materially adversely impact our results of operation and financial condition.

We are expanding our service offering to new areas, including full design and implementation of wireless communication networks. As our experience in these new areas is limited, we may face challenges that will result in significant losses and may adversely affect our financial results.

We are expanding our services offering to new areas including full design and implementation of wireless communication networks, which also include technologies of third-party vendors. Since this is a new service offering and our experience in this area is limited - the risk of not meeting our performance obligations in these projects is higher. As a result, the completion of such projects may be delayed, or the outcome may not be to the full satisfaction of the customer, who may in turn, impose penalties or exercise any other remedy available to customers in the service contract. In addition, the cost of such projects may be higher than planned. This may result in significant losses and may adversely affect our financial results.

Relying on third-party manufacturers, suppliers and service providers may disrupt the proper and timely management of deliveries of our products, a risk that is intensified in case of a single source supplier.

We outsource our manufacturing and the majority of our logistics operations, and purchase ancillary equipment for our products from contract and other independent manufacturers. Disruption in deliveries or in operations of these and other third-party suppliers or service providers, for example – as a result of capacity constraints, production disruptions, price increases, force majeure events, decreased availability of raw materials or commodities, as well as quality control problems related to components - may all cause such third parties not to comply with their contractual obligations to us. This could have an adverse effect on our ability to meet our commitments to customers and could

increase our operating costs.

Although we believe that our contract manufacturers and logistics service providers have sufficient economic incentive to perform our manufacturing and logistics services requirements, the resources devoted to these activities are not within our control. We cannot assure you that manufacturing, or logistics problems will not occur in the future due to insufficient resources devoted to our requirements by such manufacturers and logistics service providers.

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These delays, disruptions, quality control problems, loss in capacity and problems in logistics processes could result in delays in deliveries of our products to our customers, which could subject us to penalties payable to our customers, increased warranty costs as well as shipment expenses in case of expedited deliveries, possible cancellation of orders, as well as damage our reputation. If any of these problems occur, we may be required to seek alternate manufacturers or logistics service providers and we may not be able to secure such alternate manufacturers or logistics service providers that meet our needs and standards in a timely and cost-effective manner. The above-mentioned risks are exacerbated in the case of raw materials or component parts that are purchased from a single-source supplier.

Our international operations expose us to the risk of fluctuations in currency exchange rates and restrictions related to foreign currency exchange controls.

Although we derive a significant portion of our revenues in U.S. dollars, a portion of our revenues are derived from customers operating in local currencies other than the U.S. dollar. Therefore, devaluation in the local currencies of our customers relative to the U.S. dollar could cause our customers to cancel or decrease orders or to delay payment, which could have a negative impact on our revenues and results of operations. We are also subject to other foreign currency risks including repatriation restrictions in certain countries, particularly in Latin America and in Africa. See also the risk of “Due to the volume of our sales in emerging markets, we are susceptible to a number of political, economic and regulatory risks that could have a material adverse effect on our business, reputation, financial condition and results of operations.”

A substantial portion of our operating expenses are denominated in NIS, and to a lesser extent, other non-U.S. dollar currencies. Our NIS-denominated expenses consist principally of salaries and related costs as well as other related personnel expenses. In addition, our lease and facility related expenses and certain engagements with other Israeli vendors are denominated in NIS as well. We anticipate that a portion of our expenses will continue to be denominated in NIS. Devaluation of the U.S dollar against the NIS, could have a negative impact on our results of operations.

In some cases, we are paid or maintain monetary assets and liabilities, or cash reserves in certain countries, in non-U.S. dollar currencies. Significant fluctuation in these non-U.S. dollar currencies could have a significant adverse effect on our results of operation, and especially in cases where conversion to U.S. dollars and repatriation of such cash reserves is restricted or impossible, our cash balances may be significantly devalued and have a material adverse effect on our financial condition.

We use derivative financial instruments, such as foreign exchange forward contracts, to mitigate the risk of changes in foreign exchange rates on our balance sheet accounts and forecast cash flows. We do not use derivative financial instruments or other “hedging” techniques to cover all our potential exposure and may not purchase derivative instruments that adequately insulate us from foreign currency exchange risks. In some countries, we are unable to use “hedging” techniques to mitigate our risks because hedging options are not available for certain government restricted currencies. Moreover, derivative instruments are usually limited in time and as a result, cannot mitigate currency risks for the longer term. During 2018, we incurred losses in the amount of \$1.9 million as a result of exchange rate fluctuations that have not been fully offset by our hedging policy. The volatility in the foreign currency markets may make it challenging to hedge our foreign currency exposures effectively.

Moreover, some of our competitors can benefit from currency fluctuations as their costs and expenses are primarily denominated in currencies other than the U.S. dollar. In case the U.S. dollar strengthens against these currencies these competitors might offer their products and services for a lower price and capture market share from us, which might adversely affect our business and negatively influence our results of operation and financial condition.

Additional tax liabilities could materially adversely affect our results of operations and financial condition.

As a global corporation, we are subject to income and other taxes both in Israel and in various foreign jurisdictions. Our domestic and international tax liabilities are subject to the allocation of revenues and expenses in different jurisdictions and the timing of recognizing revenues and expenses. Our tax expense includes estimates or additional tax, which may be incurred for tax exposures and reflects various estimates and assumptions, including assessments of our future earnings that could impact the valuation of our deferred tax assets. From time to time, we are subject to income and other tax audits, the timing of which are unpredictable. Our future results of operations could be adversely affected by changes in our effective tax rate as a result of a change in the mix of earnings in countries with differing statutory tax rates, changes in our overall profitability, changes in tax legislation and rates, changes in tax treaties, changes in international tax guidelines (such as the OECD Base Erosions and Profit Shifting project – known as BEPS), changes in generally accepted accounting principles, changes in the valuation of deferred tax assets and liabilities, the results of audits and examinations of previously filed tax returns and continuing assessments of our tax exposures. While we believe we comply with applicable tax laws, there can be no assurance that a governing tax authority will not have a different interpretation of the law and impose additional taxes. Should we be assessed with additional taxes, there could be a material adverse effect on our results of operations and financial condition.

Our business activities in multiple countries may also expose us to indirect as well as withholding taxes in those countries. Our inability to meet certain tax regulations related to indirect or withholding taxes as well as different interpretations applied by the governing tax authorities to those regulations may expose us to additional tax payments and penalties. These could have a material adverse impact on our results of operations and financial condition.

Due to the volume of our sales in emerging markets, we are susceptible to a number of political, economic and regulatory risks that could have a material adverse effect on our business, reputation, financial condition and results of operations.

A majority of our sales are made in emerging economies in Latin America, India, Asia Pacific and Africa. For each of the years ended December 31, 2018 and 2017, sales in these regions accounted for approximately 77% and 74% of our revenues, respectively. As a result, the occurrence of international, political, regulatory or economic events in these regions could adversely affect our business and result in significant revenue shortfalls and collection risk. Any such revenue shortfalls and/or collection risks could have material adverse effects on our business, financial condition and results of operations. For example, in the past few years, due to a shortage of foreign currency, the Central Bank of Nigeria put in place a number of currency controls aimed at reducing the flow of foreign currency in Nigeria and out of the country. These restrictions make it hard for our customers in Nigeria to pay for equipment purchases in U.S. dollars. In some cases, payment for imported goods is made in Nigerian Naira, which exposes us to significant currency fluctuations.

Below are some of the risks and challenges that we face as a result of doing business internationally, several of which are more likely in the emerging markets than in other countries:

- unexpected changes in or enforcement of regulatory requirements, including security regulations relating to international terrorism and hacking concerns and regulations related to licensing and allocation processes;

- unexpected changes in or imposition of tax, tariffs, customs levies or other barriers and restrictions, including as a result of actions threatened or taken by the Trump Administration in the United States;

- fluctuations in foreign currency exchange rates;

- restrictions on currency and cash repatriation;

burden of complying with a variety of foreign laws, including foreign import restrictions which may be applicable to our products;

- difficulties in protecting intellectual property;
- laws and business practices favoring local competitors;
- demand for high-volume purchases with discounted prices;
- collection delays and uncertainties;

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- civil unrest, war and acts of terrorism;
- requirements to do business in local currency; and
- requirements to manufacture or purchase locally.

Business practices in emerging markets may expose us to legal and business conduct-related regulatory risks.

Local business practices in jurisdictions in which we operate, and particularly in emerging markets, may be inconsistent with international regulatory requirements, such as anti-corruption and anti-bribery laws and regulations, to which we are subject. It is possible that, notwithstanding our policies and in violation of our instructions, some of our employees, subcontractors, agents or partners may violate such legal and regulatory requirements, which may expose us to criminal or civil enforcement actions. If we fail to comply with such legal and regulatory requirements, our business and reputation may be harmed.

A decrease in the industry or reduction in our customers' revenues from increased regulation or new mobile services may cause operators' investments in networks to slow, be delayed or stop, which could harm our business.

We are exposed to changing network models that affect operator spending on infrastructure as well as trends in investment cycles of telecom operators and other service providers. The changes include: 1) further expansion of coverage; expansion out of metro, as well as other urban and suburban areas to rural areas; 2) densification and optimization of the 4G network, within the evolution of the LTE standard from relatively low speed single carrier LTE to high speed multiple carrier LTE (LTE-A), to Gigabit 4G LTE (LTE-A-Pro) and network densification and optimization investments that are designed to provide both additional network capacity and higher speeds for a better user experience to the subscriber; 3) early introduction of 5G services; and 4) 2G networks shutdown, which is expected to take place within the next several years and designed to free spectrum for the delivery of additional 4G Gigabit LTE and 5G services.

The proliferation of strategic options for service providers, as outlined above, may cause service providers to prolong evaluations of services and network strategies, resulting in slower and smaller budget spent in the next several years, which may negatively affect our business. In addition, the intensification of use of "over-the-top services" - which make use of the operators' network to deliver rich content to users but do not generate revenue to operators - is causing operators to lose a substantial portion of their potential revenues. Also, recent changes to United States policy against "net neutrality" along with the ongoing court appeals may cause uncertainty in the market and may negatively affect operators' revenue streams in the United States, which may cause a decrease in network investments. Also, the potential adoption of the "net neutrality" policy in other countries, may also negatively affect operators' revenue streams in those countries and result in a decrease in network investments. In addition, changes in regulatory requirements in certain jurisdictions around the world are allowing smaller operators to enter the market, which may also reduce our customers' pricing to their end-users, further causing them to lose revenues. This has made operators more careful in their spending on infrastructure upgrades and build-outs.

As a result, operators are looking for more cost-efficient solutions and network architectures, which will allow them to break the linearity of cost, coverage, capacity and costs of service delivery through more efficient use of existing infrastructure and assets. If operators fail to monetize new services, fail to introduce new business models or experience a decline in operator revenues or profitability, their willingness to invest further in their network systems may decrease, which will reduce their demand for our products and services and may have an adverse effect on our business, operating results and financial condition.

Global competition and current market conditions, including those specifically impacting the telecommunications industry, have resulted in downward pressure on the prices for our products, which could result in reduced revenues, gross margins, profitability and demand for our products and services.

We and other manufacturers of telecommunications equipment are experiencing, and are likely to continue to experience, increased downward price pressure, particularly as we increase our customer base to include more Tier 1 customers (customers who are telecom operators with national or multinational service coverage that can reach every other network without purchasing network resources from other network communication providers) and continue to meet market demand in certain emerging markets and other less profitable countries. As a result, we may experience declining average sales prices for our products. Our future profitability will depend upon our ability to improve manufacturing efficiencies, to reduce costs of materials used in our products, and to continue to “design to cost”, i.e., introduce new lower-cost products and product enhancements. Since customers frequently negotiate supply arrangements far in advance of delivery dates, we may be required to commit to price reductions for our products before we are aware of how, or if, cost reductions can be obtained. Current or future price reduction commitments and any inability on our part to respond to increased price competition, in particular from Tier 1 customers with higher volumes and stronger negotiating power, could harm our profitability, business, financial condition and results of operations. Alternatively, if we decide not to pursue some of the deals, our revenues might significantly decrease and harm our business and financial results.



In recent years, we have increased our sales in India, a region typically characterized as being price-sensitive, resulting in pressure on our prices. In 2018, 38.2% of our revenues were earned in India, while in prior years – 2017, 2016 and 2015 – 39.2%, 27.3% and 30.3%, of our revenues, respectively, were generated from sales in India. We expect that our revenues from sale of products in India will continue to constitute a significant portion of our business in the future. In addition, we anticipate continued demand for our products and/or services in Latin America, a market which is also characterized by strong downward pricing pressures.

Challenging global economic conditions could also have adverse, wide-ranging effects on demand for our products and services, as well as for the products of our customers, which could result in reduced revenues, gross margins and profitability.

The telecommunications industry has experienced downturns in the past, in which operators substantially reduced their capital spending on new equipment. Continued adverse economic conditions, which currently exist in certain jurisdictions, including certain countries in Latin America, Eastern Europe and Africa, could cause network operators to postpone investments or initiate other cost-cutting initiatives to improve their financial position. Over the past several years, network operators have started to share parts of their network infrastructure through cooperation agreements rather than through legal consolidation, which may adversely affect demand for lower cost network equipment. Moreover, the level of demand by operators and other customers who buy our products and services can change quickly and can vary over short periods, including on a monthly basis.

If the current global economic situation deteriorates, or if the uncertainty and variations in the telecommunications industry continues, our business could be negatively impacted. For example, we could experience reduced demand for our products and services, slowed customer buying decisions, pricing pressures, possible withdrawal of global operators from some geographies in which they currently operate and in which we sell and supplier or customer disruptions. Furthermore, insolvency of some of our key distributors, resellers, original equipment manufacturers (OEMs) and systems integrators, could impair our distribution channels. Any of these contingencies could reduce our revenues or our ability to collect our accounts receivable, and have a material adverse effect on our financial condition and results of operations.

If we fail to develop and market new products that keep pace with technological developments, the changing industry standards and our customers' needs, we may not be able to grow or sustain our business.

The market for our products is characterized by rapid technological advances, changing customer needs that expect increase in product performance and evolving industry standards, as well as increasing pressures to make existing products more cost efficient. Accordingly, our success will depend, among other things, on our ability to develop and market new products or enhance our existing products in a timely manner to keep pace with developments in technology and customer requirements.

In addition, the wireless equipment industry is subject to rapid change in technological and industry standards. This rapid change, through official standards committees or widespread use by operators, could either render our products obsolete or require us to modify our products, necessitating significant investment, both in time and cost, in new technologies, products and solutions. We cannot assure you that we will bring products into full production with acceptable reliability, or that any development or production ramp-up will be completed in a timely or cost-effective manner.

We cannot assure you that we will continue to successfully forecast technology trends or that we will continue to anticipate innovations made by other companies and respond with innovation in a timely manner, which could affect our competitiveness in the market.

Our market is also characterized by a growing demand for more sophisticated and rich software-based capabilities within the network IP layer, some which may require us to utilize and embed additional components, either in hardware or third-party software, in solutions we provide. We therefore cannot assure you that we will continue to be successful in providing these necessary software based capabilities in a cost-effective manner, which could affect our business performance.

Some of our technology leadership has been achieved by innovation through design of state-of-the-art Systems on Chip (SoC), which we vertically integrate in the products we provide. We cannot assure you that we will be able to successfully complete such sophisticated and technology-rich SoCs and as a result, we may need to purchase SoCs from another source, which will be more expensive and will negatively impact our gross profit.

We are continuously seeking to develop new products and enhance our existing products. In 2013 we announced a significant line of products (IP-20 Platform), which we have continued to enhance with newer products and capabilities every year since.

Recently, we announced a new solution, which joins our line of point-to-point wireless backhaul products, designed to deliver premium wireless backhaul capabilities with a routing layer (the IP-50 Platform). Products within this new solution are expected to be released over the next months and quarters, delivering solutions to various use cases. Developing new products and product enhancements requires research and development resources. We may not be successful in enhancing our existing products or developing new products in response to technological advances or in satisfying increasingly sophisticated customer needs in a timely and cost-effective manner, all of which would have a material adverse effect on our ability to grow or maintain our business.

Moreover, we cannot provide any assurance that new products being developed based on the IP-20 Platform, or IP-50 Platform, will be accepted in the market or will result in profitable sales or that such products will not require additional quality assurance and defect-fixing processes.

We cannot assure you that the sales of some of our products (such as the IP-20 Platform products) will not be negatively affected in volume and timing, as a result of anticipation for the newer products that are expected to be released as part of the IP-50 Platform.

In addition, we record perpetual usage rights of technologies of third parties, as well as part of our R&D investments, as assets on our balance sheet. While at the time we record such items as assets, the estimated risk of failure of our R&D integration efforts into our new products and into our new SoC is low, if we fail with our new product introduction, we may incur significant loss.

Breaches of network or information technology security could have an adverse effect on our business.

Cyber-attacks or other breaches of network or IT security may cause equipment failures or disrupt our systems and operations. We may be subject to attempts to breach the security of our networks and IT infrastructure through cyber-attacks, malware, computer viruses and other means of unauthorized access. While we maintain insurance coverage for some of these events, the potential liabilities associated with these events could exceed the insurance coverage we maintain. While we maintain redundancy and disaster recovery practices for our critical services, we cannot assure you that our cyber-security measures and technology will adequately protect us from these and other risks. Furthermore, our inability to operate our facilities as a result of such events, even for a limited period of time, may result in significant expenses or loss of market share to our competitors. In addition, a failure to protect the privacy of customer or employee confidential data against breaches of network or IT security could result in damage to our reputation.

Maintaining the security of our products, computers and networks is a critical issue for us and our customers, therefore each year we invest additional resources and technologies to better protect our assets. We believe that

employee awareness is one of the best defensive tools, and thus we continue to implement best practices in this area.

In 2019 we will continue to increase the time spent by our Chief Information Security Officer and his teams in preventing cyber security attacks while being focused on cloud-based solutions. However, security researchers, criminal hackers and other third parties regularly develop new techniques to penetrate computer and network security measures. In addition, hackers also develop and deploy viruses, worms and other malicious software programs, some of which may be specifically designed to attack our products, systems, computers or networks. Additionally, external parties may attempt to fraudulently induce our employees or users of our products to disclose sensitive information in order to gain access to our data or our customers' data. These potential breaches of our security measures and the accidental loss, inadvertent disclosure or unauthorized dissemination of proprietary information or sensitive, personal or confidential data about us, our employees or our customers, including the potential loss or disclosure of such information or data as a result of hacking, fraud, trickery or other forms of deception, could expose us, our employees, our customers or the individuals affected, to a risk of loss or misuse of this information, result in litigation and potential liability or fines for us, damage to our brand and reputation or otherwise harm our business.

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Cyber- attacks on our customers' networks involving our products could have an adverse effect on our business

Cyber- attacks, or other breaches of security on our customers' networks, may be initiated at any network location or device including initiation through our products. Although we maintain high level of cyber- security aware development processes, we cannot assure that such attacks, or other breaches of security through our products, will fail and therefore may negatively affect our customers' business. While we maintain insurance coverage for some of these events, the associated potential liabilities could exceed the insurance coverage we maintain. In addition, these events could also result in damage to our reputation which will further negatively impact our business.

Maintaining the security of our products which are installed with our customers is a critical issue for us, therefore each year we invest additional resources and technologies to better protect our assets. However, security researchers, criminal hackers and other third parties regularly develop new techniques to penetrate computer and network security measures. Hackers also develop and deploy viruses, worms and other malicious software programs, some of which may be specifically designed to attack our products. These potential breaches of our security measures could expose our customers to network failures or other related risks, result in litigation and potential liability or fines for us, damage to our brand and reputation or otherwise harm our business.

Our contract manufacturers obtain some of the components included in our products from a limited group of suppliers and, in some cases, single or sole source suppliers. The loss of or problems in any of these suppliers could cause us to experience production and shipment delays as well as additional costs, which may result in a substantial cost increase or loss of revenue.

Our contract manufacturers currently obtain key components from a limited number of suppliers. Some of these components are obtained from a single or sole source supplier. Our contract manufacturers' dependence on a single or sole source supplier, or on a limited number of suppliers, subjects us to the following risks:

The component suppliers may experience shortages in components and interrupt or delay their shipments to our contract manufacturers. Consequently, these shortages could delay the manufacture of our products and shipments to our customers, which could result in increased manufacturing and shipment costs, penalties or cancellation of orders for our products.

The component suppliers could discontinue the manufacture or supply of components used in our systems. In such an event, we or our contract manufacturers may be unable to develop alternative sources for the components necessary to manufacture our products, which could force us to redesign our products or buy a large stock of the component into inventory before it is discontinued. Any such redesign of our products would likely interrupt the manufacturing process and could cause delays in our product shipments. Moreover, a significant modification in our product design may increase our manufacturing costs and bring about lower gross margins. In addition, we may be exposed to excess inventory of such component, which we will have to write-down in case the demand is not as high as we have anticipated at the time of buying these components.

The component suppliers may significantly increase component prices at any time and with immediate effect, particularly if demand for certain components increases dramatically in the global market. These price increases would increase component procurement costs and could significantly reduce our gross margins and profitability.

Although we were profitable and generated cash from our operations during 2015 - 2018, we cannot assure you that we will be able to maintain profitability or continue to have positive operating cash flows.

In the past, we have incurred significant losses and a negative cash flow from operations. As of 2015 we are profitable and in the last four years, we recognized positive net income and generated cash flow from operating activities. In 2018 we recognized net income of \$23.0 million and generated cash from operating activities of \$22.5 million. However, there is no assurance that we will be able to maintain or improve such results, which may require the

implementation of additional cost reduction measures. Our failure to maintain profitability or to continue to have positive operating cash flows may impact our ability to compete in the market for the short and long term and may impair our financial condition.

The emergence of new 5G radio access technologies, which make use of high frequency microwave and millimeter-wave spectrum in network architectures different than point-to-point, could potentially be used by existing and new vendors to provide new and different wireless backhaul solutions and cause our revenues to decrease.

The 5G industry is making significant efforts to provide ultra-high speed multi-Gbps mobile and fixed access between networks and people through smartphones, tablets, CPEs and other devices, as well as machines such as meters, street surveillance and body-worn cameras and more. In order to achieve such high access speeds, microwave and millimeter-wave spectrum, which is currently used primarily for wireless backhaul, may be used more often. Regulators are also making changes to the regulatory status of such additional high frequency spectrum for access use, traditionally used for wireless backhaul. Numerous companies have responded by investing in the development of such access technologies to resolve these challenges in an innovative and cost-effective manner supported by the availability of standards based components and products, some of which could potentially be used for wireless backhaul as well. If such products and solutions are made available, they have the potential of taking a share from our available backhaul market. If we are unable to respond in time by developing competing and cost-effective high-speed wireless backhaul solutions, we could be negatively affected in market share, revenues and profits.

Consolidation of our potential customer base could harm our business.

The increasing trend towards mergers in the telecommunications industry has resulted in the consolidation of our potential customer base. In situations where an existing customer consolidates with another industry participant, which uses a competitor's products, our sales to that existing customer could be reduced or eliminated completely to the extent that the consolidated entity decides to adopt the competing products. Further, consolidation of our potential customer base could result in purchasing decision delays as consolidating customers integrate their operations and could generally reduce our opportunities to win new customers, to the extent that the number of potential customers decreases. Moreover, some of our potential customers may agree to share networks, resulting in a decreased requirement for network equipment and associated services, and thus a decrease in the overall size of the market. Some network operators share parts of their network infrastructure through cooperation agreements rather than legal consolidations, which may adversely affect demand for network equipment and could harm our business and results of operations.

We face intense competition from other communications solutions that compete with our high-capacity point-to-point wireless products, which could reduce demand for our products and have a material adverse effect on our business and results of operations.

Our products compete with other high-speed communications solutions, including fiber optic lines and other wireless technologies. Some of these technologies utilize existing installed infrastructure and have achieved significantly greater market acceptance and penetration than high-capacity point-to-point wireless technologies. Moreover, as more and more data demands are imposed on existing network frameworks, and due to consolidation of fixed and mobile operators, operators may be more motivated to invest in more expensive high-speed fiber optic networks to meet current needs and remain competitive.

Some of the principal disadvantages of high capacity, point-to-point wireless technologies that may make other technologies more appealing include suboptimal operations in extreme weather conditions and limitations in connection with the need to establish line of sight between antennas and limitations in site acquisition for multiple links, favoring other technologies.

To counter the disadvantages of point to point wireless technologies, license exempt technologies in the V-band spectrum (60Ghz band), which can operate in the wide bandwidth available at this band, may be used to deliver multi-Gbps capacity backhaul for a limited set of scenarios, such as dense urban, serving short range point-to-multipoint communications, thereby reducing site acquisition barriers, enabling flexible deployment models. Though the applicability of such solutions is limited to a small set of use cases, with shared capacity thus limiting the peak capacity available for urban backhaul, those may take a share of point to point solutions we provide for these same urban scenarios.

To the extent that these competing communications solutions reduce demand for our high-capacity point-to-point wireless transmission products, there may be a material adverse effect on our business and results of operations.

In projects in which we supply installation or rollout services, we may be required to ramp up rapidly in order to meet our customer's timelines.

In large projects in the frame of which we supply installation or rollout services, we may be required to ramp up rapidly in order to meet our customer's requirements. In some cases, we receive orders, which require substantial and rapid acquisition of services by third party service providers or fast hiring of additional employees.

If we are unsuccessful in obtaining rapidly, high quality large scale third party services, or hiring adequate employees, we may not be able to meet our obligations to our customers and may be required to pay penalties or even face the cancelation of orders.

Our failure to establish and maintain effective internal control over financial reporting could result in material misstatements in our financial statements or a failure to meet our reporting obligations. This may cause investors to lose confidence in our reported financial information, which could result in the trading price of our shares to decline.

Our management is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Rule 13a-15(f) of the U.S. Securities Exchange Act of 1934, as amended (the "Exchange Act"). Under the supervision and with the participation of our management, including the Chief Executive Officer ("CEO") and the Chief Financial Officer ("CFO"), we carried out an evaluation of the effectiveness of our internal control over financial reporting as of December 31, 2018, using the criteria established in "Internal Control - Integrated Framework" set forth by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) (COSO). Based on our assessment under that framework and the criteria established therein, our management concluded that the Company's internal control over financial reporting was effective as of December 31, 2018 in providing reasonable assurance regarding the reliability of the Company's financial reporting.

However, if we conclude in the future that our internal controls over financial reporting are not effective, we may fail to meet our future reporting obligations on a timely basis, our financial statements may contain material misstatements, our operating results may be negatively impacted, and we may be subject to litigation and regulatory actions, causing investor perceptions to be adversely affected and potentially resulting in a decline in the market price of our shares. Even if we conclude that our internal controls over financial reporting are adequate, any internal control or procedure, no matter how well designed and operated, can only provide reasonable assurance of achieving desired control objectives and cannot prevent all mistakes or intentional misconduct or fraud.

Due to inaccurate forecasts, we may be exposed to inventory-related losses on inventory purchased by our contract manufacturers and other suppliers, or to increased expenses should unexpected production ramp up be required. In addition, part of our inventory may be written off, which would increase our cost of revenues.

Our contract manufacturers and other suppliers are required to purchase inventory based on manufacturing projections we provide to them. If the actual orders from our customers are lower than projected, or the mix of products ordered changes, or if we decide to change our product line and/or our product support strategy, our contract manufacturers or other suppliers will have excess inventory of raw materials or finished products, which we would typically be required to purchase, thus incurring additional costs and our gross profit and results of operations could be adversely affected. In addition, our inventory levels may be too high, and inventory may become obsolete or over-stated on our balance sheet. This would require us to write off inventory, which could adversely affect our gross profit and results of operations.

We require our contract manufacturers and other suppliers from time to time, to purchase more inventory than is immediately required and with respect to our contract manufacturers, to partially assemble components, in order to shorten our delivery time in case of an increase in demand for our products. In the absence of such increased demand, we may need to make advance payments, compensate our contract manufacturers or other suppliers, or even buy the redundant inventory, as needed. We also may purchase components or raw materials from time to time for use by our contract manufacturers in the manufacturing of our products. This may cause additional write offs and may have a negative impact on our results of operations and cash flow.

Alternatively, if we underestimate our requirements and our actual orders from customers are significantly larger than our planned forecast, we may be required to accelerate the production and purchase of supplies, which may result in additional costs of buying components at less attractive prices, paying expediting fees and excess shipment costs, overtime and other manufacturing expenses. As a result, our gross margins and results of operations could be

adversely affected.

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Inventory of raw materials, work in-process or finished products located either at our warehouses or our customers' sites as part of the network build-up may accumulate in the future, and we may encounter losses due to a variety of factors, including:

- new generations of products replacing older ones, including changes in products because of technological advances and cost reduction measures; and

- the need of our contract manufacturers to order raw materials that have long lead times and our inability to estimate exact amounts and types of items thus needed, especially with regard to the frequencies in which the final products ordered will operate.

Further, our inventory of finished products located either at our warehouse or our customers' sites as part of a network build-up may accumulate if a customer were to cancel an order or refuse to physically accept delivery of our products, or in rollout projects, which include acceptance tests, refuse to accept the network. The rate of accumulation may increase in a period of economic downturn.

Our sales cycles in connection with competitive bids or to prospective customers are lengthy.

It typically takes from three to twelve months after we first begin discussions with a prospective customer, before we receive an order from that customer, if an order is received at all. In some instances, we participate in competitive bids, in tenders issued by our customers or prospective customers, and these tender processes can continue for many months before a decision is made by the customer. In addition, even after the initial decision is made, there may be a lengthy testing and integration phase or contract negotiation phase before a final decision to purchase is made. In some cases, even if we have signed a contract and our products were tested and approved for usage, it could take a significant amount of time until the customer places purchase orders, if at all. As a result, we are required to devote a substantial amount of time and resources to secure sales. In addition, the lengthy sales cycle results in greater uncertainty with respect to any particular sale, as events that impact customers' decisions occur during such cycle and in turn, increase the difficulty of forecasting our results of operations.

If we fail to obtain regulatory approval for our products, or if sufficient radio frequency spectrum is not allocated for use by our products, our ability to market our products may be restricted.

Generally, our products must conform to a variety of regulatory requirements and international treaties established to avoid interference among users of transmission frequencies and to permit interconnection of telecommunications equipment. Any delays in compliance with respect to our future products could delay the introduction of those products. Also, these regulatory requirements may change from time to time, which could affect the design and marketing of our products as well as the competition we face from other suppliers' products, which may not be affected as much from such changes. Delays in allocation of new spectrum for use with wireless backhaul communications, such as the E and V bands in various countries, at prices which are competitive for our customers, may also adversely affect the marketing and sales of our products.

In addition, in most jurisdictions in which we operate, users of our products are generally required to either have a license to operate and provide communications services in the applicable radio frequency or must acquire the right to do so from another license holder. Consequently, our ability to market our products is affected by the allocation of the radio frequency spectrum by governmental authorities, which may be by auction or other regulatory selection. These governmental authorities may not allocate sufficient radio frequency spectrum for use by our products. We may not be successful in obtaining regulatory approval for our products from these authorities and as we develop new products either our products or some of the regulations will need to change to take full advantage of the new product capabilities in some geographies. Historically, in many developed countries, the lack of available radio frequency spectrum has inhibited the growth of wireless telecommunications networks. If sufficient radio spectrum is not allocated for use by our products, our ability to market our products may be restricted, which would have a materially

adverse effect on our business, financial condition and results of operations. Additionally, regulatory decisions allocating spectrum for use in wireless backhaul at frequencies used by our competitors' products, could increase the competition we face.

Other areas of regulation and governmental restrictions, including tariffs on imports and technology controls on exports or regulations related to licensing and allocation processes, could adversely affect our operations and financial results.

Our products are used in critical communications networks, which may subject us to significant liability claims.

Since our products are used in critical communications networks, we may be subject to significant liability claims if our products do not work properly. The terms of agreements with our customers do not always provide sufficient protection from liability claims. In addition, any insurance policies we have may not adequately cover our exposure with respect to such claims. We warrant to our current customers that our products will operate in accordance with our product specifications, but if our products fail to conform to these specifications, our customers could require us to remedy the failure or could assert claims for damages. Liability claims could require us to spend significant time and money in litigation or to pay significant damages. Any such claims, successful or not, would be costly and time-consuming to defend, and could divert management's attention and seriously damage our reputation and our business.

Our international wireless backhaul operations subject us to various regulations. Liabilities for failure to comply with these regulations could materially impact our business, results of operations and financial condition.

Due to the nature of our global operations, we must comply with certain international and domestic laws, regulations and restrictions, which may expose our business to risks including the following:

Our business is subject to numerous laws and regulations designed to protect the environment, including with respect to discharge management of hazardous substances. Although we believe that we comply with these requirements and that such compliance does not have a material adverse effect on our results of operations, financial condition or cash flows, the failure to comply with current or future environmental requirements could expose the Company to criminal, civil and administrative charges. Due to the nature of our business and environmental risks, we cannot provide assurance that any such material liability will not arise in the future.

Our wireless communications products emit electromagnetic radiation. While we are currently unaware of any negative effects associated with our products, there has been publicity regarding the potentially negative direct and indirect health and safety effects of electromagnetic emissions from wireless telephones and other wireless equipment sources, including allegations that these emissions may cause cancer. Health and safety issues related to our products may arise that could lead to litigation or other actions against us or to additional regulation of our products, and we may be required to modify our technology without the ability to do so. Even if these concerns prove to be baseless, the resulting negative publicity could affect our ability to market these products and, in turn, could harm our business and results of operations. Claims against other wireless equipment suppliers or wireless service providers could adversely affect the demand for our backhaul solutions.

The regulatory framework for data protection and privacy issues is rapidly evolving worldwide and is likely to continue developing in the foreseeable future. As such, in May 2016, the European Union adopted the General Data Protection Regulation ("GDPR"), fully enforceable as of May 25, 2018, which imposes stricter data protection obligations and provides for greater penalties for noncompliance. We may be required to incur significant costs to comply with such data and privacy protection laws, rules and regulations, as applicable upon our Company. Any inability to adequately address these privacy and data protection concerns or to comply with the respective applicable laws, rules and regulations could have an adverse effect on our business prospects, results of operations and/or financial position.

We could be adversely affected by our failure to comply with the covenants in our credit agreement or by the failure of any bank to provide us with credit under committed credit facilities.

We have a committed credit facility available for our use from a syndicate of several banks. Our credit agreement contains financial and other covenants. Any failure to comply with the covenants, including due to poor financial performance, may constitute a default under the credit facility, which may have a material adverse effect on our financial condition. In addition, the payment may be accelerated, and the credit facility may be cancelled upon an

event, in which a current or future shareholder acquires control (as defined under the Israeli Securities Law) of us. For more information, please refer to Item 5: “OPERATING AND FINANCIAL REVIEW AND PROSPECTS; Liquidity and Capital Resources.”

In addition, the credit facility is provided by the syndication with each bank agreeing severally (and not jointly) to make its agreed portion of the credit loans to us. If one or more of the banks providing the committed credit facility were to default on its obligation to fund its commitment, the portion of the committed facility provided by such defaulting bank would not be available to us.

We sell other manufacturers' products as an original equipment manufacturer, or OEM, which subjects us to various risks that may cause our revenues to decline.

We sell a limited number of products on an OEM basis through relationships with a number of equipment vendors and software vendors. Our sale of OEM products exposes us to the risk that these equipment vendors and software vendors might terminate their relationships with us, experience technical and financial problems, decide to promote their products through other channels, fail to deliver their products or discontinue production of their products. If we cannot develop alternative sources for OEM products, we could lose certain customers and our revenues could decline.

If we are unable to protect our intellectual property rights, our competitive position may be harmed.

Our ability to compete will depend, in part, on our ability to obtain and enforce intellectual property protection for our technology internationally. We currently rely upon a combination of trade secret, patent, trademark and copyright laws, as well as contractual rights, to protect our intellectual property. However, as our patent portfolio may not be as extensive as those of our competitors, we may have limited ability to assert any patent rights in negotiations with, or in counterclaims against, competitors who assert intellectual property rights against us.

We also enter into confidentiality, non-competition and invention assignment agreements with our employees and contractors engaged in our research and development activities, as well as non-disclosure agreements with our suppliers and certain customers so as to limit access to and disclosure of our proprietary information. We cannot assure you that any steps taken by us will be adequate to deter misappropriation or impede independent third-party development of similar technologies. Moreover, under current law, we may not be able to enforce the non-competition agreements with our employees to their fullest extent.

We cannot assure you that the protection provided for our intellectual property by the laws and courts of foreign nations will be substantially similar to the remedies available under U.S. law. Furthermore, we cannot assure you that third parties will not assert infringement claims against us based on foreign intellectual property rights and laws that are different from those established in the United States. Any such failure or inability to obtain or maintain adequate protection of our intellectual property rights, for any reason, could have a material adverse effect on our business, results of operations and financial condition.

Defending against intellectual property infringement claims could be expensive and could disrupt our business.

The wireless equipment industry is characterized by vigorous protection and pursuit of intellectual property rights, which has resulted in often protracted and expensive litigation. We have been exposed to infringement allegations in the past, and we may in the future be notified that we or our vendors, allegedly infringed certain patent or other intellectual property rights of others. Any such litigation or claim could result in substantial costs and diversion of resources. In the event of an adverse result of any such litigation, we could be required to pay substantial damages (including potentially treble damages and attorney's fees should a court find such infringement willful), or to cease the use and licensing of allegedly infringing technology and the sale of allegedly infringing products (including those we purchase from third parties). We may be forced to expend significant resources to develop non-infringing technology, obtain licenses for the infringing technology or replace infringing third party equipment. We cannot assure you that we would be successful in developing such non-infringing technology, that any license for the infringing technology would be available to us on commercially reasonable terms, if at all, or that we would be able to find a suitable substitute for infringing third party equipment.

If we fail to attract and retain qualified personnel, our business, operations and product development efforts may be materially adversely affected.

Our products require sophisticated research and development, marketing and sales, and technical customer support. Our success depends on our ability to attract, train and retain qualified personnel in all these professional areas while

also taking into consideration varying geographical needs and cultures. We compete with other companies for personnel in all of these areas, both in terms of profession and geography, and we may not be able to hire sufficient personnel to achieve our goals or support the anticipated growth in our business. The market for the highly-trained personnel we require globally is competitive, due to the limited number of people available with the necessary technical skills and understanding of our products and technology. If we fail to attract and retain qualified personnel due to compensation or other factors, our business, operations and product development efforts would suffer.

## Risks Related to Our Ordinary Shares

Holders of our ordinary shares who are U.S. residents may be required to pay additional U.S. income taxes if we are classified as a passive foreign investment company (“PFIC”) for U.S. federal income tax purposes.

There is a risk that we may be classified as a PFIC. Our treatment as a PFIC could result in a reduction in the after-tax return for U.S. holders of our ordinary shares and may cause a reduction in the value of our shares. For U.S. federal income tax purposes, we will generally be classified as a PFIC for any taxable year in which either: (1) 75% or more of our gross income is passive income, or (2) at least 50% of the average value (determined on a quarterly basis) of our total assets for the taxable year produce, or are held for the production of, passive income. Based on our analysis of our income, assets, activities and market capitalization, we do not believe that we were a PFIC for the taxable year ended December 31, 2018. However, there can be no assurance that the United States Internal Revenue Service (“IRS”) will not challenge our analysis or our conclusion regarding our PFIC status. There is also a risk that we were a PFIC for one or more prior taxable years or that we will be a PFIC in future years, including 2019. If we were a PFIC during any prior years, U.S. shareholders who acquired or held our ordinary shares during such years will generally be subject to the PFIC rules. The tests for determining PFIC status are applied annually and it is difficult to make accurate predictions of our future income, assets, activities and market capitalization, which are relevant to this determination. If we were determined to be a PFIC for U.S. federal income tax purposes, highly complex rules would apply to U.S. holders owning our ordinary shares and such U.S. holders could suffer adverse U.S. tax consequences.

For more information, please see Item 10. ADDITIONAL INFORMATION – E. Taxation - “U.S. Federal Income Tax Considerations” – “Tax Consequences if We Are a Passive Foreign Investment Company.”

Changes to the U.S. federal tax laws, including the recent enactment of certain tax reform measures, could have an impact on a shareholder’s investment in the Company.

U.S. federal income tax laws and the administrative interpretations of those laws may be amended at any time, potentially with retroactive effect. On December 22, 2017, P.L. 115-97 (the “Tax Act”) was signed into law making significant changes to U.S. federal tax laws. The Tax Act, among other things, reduces the corporate tax rate from a top marginal rate of 35% to a flat rate of 21%, limits the tax deduction for interest expense to 30% of adjusted taxable income (except for certain small businesses), implements a “base erosion anti-abuse tax” which requires U.S. corporations to make an alternative determination of taxable income without regard to tax deductions for certain payments to affiliates, taxes certain non-U.S. corporations’ earnings considered to be “global intangible low taxed income” (also referred to as “GILTI”), repeals the alternative minimum tax, or AMT, for corporations and changes a taxpayer’s ability to either utilize or refund the AMT credits previously generated, changes the attribution rules relating to shareholders of certain “controlled foreign corporations”, limits the deduction for net operating losses carried forward from taxable years beginning after December 31, 2017 to 80% of current year taxable income and eliminates net operating loss carrybacks, imposes a one-time tax on offshore earnings at reduced rates regardless of whether they are repatriated, eliminates U.S. tax on foreign earnings (subject to certain important exceptions), allows immediate deductions for certain new investments instead of deductions for depreciation expense over time, and modifies or repeals many business deductions and credits. Notwithstanding the reduction in the U.S. corporate income tax rate, the overall impact of the Tax Act is uncertain and our business and financial condition could be adversely affected.

Since enactment, the IRS has issued proposed and final regulations, some of which may be further revised and possibly withdrawn, implementing the changes to the U.S. federal tax laws pursuant to the Tax Act. We are unable to predict what federal tax laws may be proposed or enacted in the future or what effect such changes would have on our business, but such changes, to the extent they are brought into tax legislation, regulations, policies or practices, could affect our effective tax rates in the future in countries where we have operations and have an adverse effect on our overall tax rate in the future, along with increasing the complexity, burden and cost of tax compliance. We urge holders to consult with their legal and tax advisors with respect to this legislation and the potential tax consequences of investing in or holding our shares.





The price of our ordinary shares is subject to volatility. Such volatility could limit investors' ability to sell our shares at a profit, could limit our ability to successfully raise funds and may expose us to class actions against the Company and its senior executives.

The stock market in general, and the market price of our ordinary shares in particular, are subject to fluctuation. As a result, changes in our share price may be unrelated to our operating performance. The price of our ordinary shares has experienced volatility in the past and may continue to do so in the future, which may make it difficult for investors to predict the value of their investment, to sell shares at a profit at any given time, or to plan purchases and sales in advance. In the two-year period ended December 31, 2018, the price of our ordinary shares has ranged from a high of \$4.95 per share to a low of \$1.64 per share. On December 31, 2018 and 2017, the closing prices of our ordinary shares were \$3.78 per share and \$1.98 per share, respectively. A variety of factors may affect the market price of our ordinary shares, including:

- announcements of technological innovations by us or by others;
- competitors' positions and other events related to this market;
- changes in the Company's estimations regarding forward looking statements and/or announcement of actual results that vary significantly from such estimations;
- the announcement of corporate transactions, merger and acquisition activities or other events impacting our revenues;
- changes in financial estimates by securities analysts;
- our earnings releases and the earnings releases of our competitors;
- other announcements, whether by the Company or others, referring to the Company's financial condition, results of operations and changes in strategy;
- the general state of the securities markets (with a particular emphasis on the technology and Israeli sectors thereof);
- the general state of the credit markets, the volatility of which could have an adverse effect on our investments; and
- global macroeconomic developments.

All these factors and any corresponding price fluctuations may materially and adversely affect the market price of our ordinary shares and may result in substantial losses to our investors.

In addition to the volatility of the market price of our shares, the stock market in general and the market for technology companies in particular, has been highly volatile and at times thinly traded. These broad market and industry factors may seriously harm the market price of our ordinary shares, regardless of our operating performance. Investors may not be able to resell their shares following periods of volatility.

Further, as a result of the volatility of our stock price, we could be subject, and are currently subject, to securities litigation, which could result in substantial costs and divert management's attention and Company resources from business. On January 6, 2015, the Company was served with a motion to approve a purported class action, naming the Company, its CEO and its directors as defendants. The motion was filed with the District Court of Tel-Aviv. The purported class action is based on Israeli law and alleges breaches of duties by making false and misleading statements in the Company's SEC filings and public statements during the period between July and October 2014. The plaintiff seeks specified compensatory damages in a sum of up to \$75,000,000, as well as attorneys' fees and costs (see below in Item 8. "FINANCIAL INFORMATION"). Although the Company believes it has a strong defense against

these allegations and that the District Court should deny the motion to approve the class action, there is no assurance that the Company's position will be accepted by the District Court. Furthermore, there is a risk that this litigation will divert the time and energy of the Company's executives and lead to damages and expenditures that may not be covered by insurance. This may adversely affect the Company's financial condition and results of operations.

Due to the size of their shareholdings, Zohar and Yehuda Zisapel have influence over matters requiring shareholder approval.

As of March 28, 2019, Zohar Zisapel, our Chairman of the Board of Directors, beneficially owned, directly or indirectly, 13.22% of our outstanding ordinary shares, and Yehuda and Nava Zisapel beneficially owned, directly or indirectly, 4.46% of our outstanding ordinary shares. Such percentages include options which are exercisable within 60 days of March 28, 2019. Yehuda and Zohar Zisapel, who are brothers, do not have a voting agreement. Regardless, these shareholders may influence the outcome of various actions that require shareholder approval. Yehuda and Nava Zisapel have an agreement which provides for certain coordination in respect of sales of shares of Ceragon as well as for tag along rights with respect to off-market sales of Ceragon's shares.

We are subject to regulations related to "conflict minerals," which could adversely impact our business.

Pursuant to Section 1502 of the Dodd-Frank Act, as a United States publicly-traded company we are required to disclose use or potential use of certain minerals and their derivatives, including tantalum, tin, gold and tungsten, that are mined from the Democratic Republic of Congo and adjoining countries and deemed conflict minerals. These requirements necessitate due diligence efforts to assess whether such minerals are used in our products in order to make the relevant required annual disclosures. We timely file our conflict minerals reports. While there are, and will be, ongoing costs associated with complying with these disclosure requirements, we may face reputational challenges that could impact future sales if we determine that certain products of ours contain minerals not determined to be conflict free, or if we are unable to verify with sufficient accuracy the origins of all conflict minerals potentially used in our products.

#### Risks Related to Operations in Israel

Conditions in the Middle East and in Israel may adversely affect our operations.

Our headquarters, a substantial part of our research and development facilities and some of our contract manufacturers' facilities are located in Israel. Accordingly, we are directly influenced by the political, economic and military conditions affecting Israel. Specifically, we could be adversely affected by:

- hostilities involving Israel;
- the interruption or curtailment of trade between Israel and its present trading partners;
- a downturn in the economic or financial condition of Israel; and
- a full or partial mobilization of the reserve forces of the Israeli army.

Israel has been subject to a number of armed conflicts that have taken place between it and its Middle Eastern neighbors. While Israel has entered into peace agreements with both Egypt and Jordan, it has no peace arrangements with any other Arab countries. Further, all efforts to improve Israel's relationship with the Palestinians have failed to result in a peaceful solution, and there have been numerous periods of hostility in recent years. This state of hostility, varying from time to time in intensity and degree, has led to security and economic problems for Israel.

From time to time, Israel is engaged in armed conflicts with Hamas, a militia group and political party controlling the Gaza Strip. These conflicts have involved missile strikes against civilian targets in various parts of Israel, last in November 2018, as well as civil insurrection of Palestinians in the West Bank, on the border with the Gaza Strip and in Israeli cities.

In addition, the continuation of the civil war in Syria and renewed conflict with Hezbollah (a Lebanese Islamist Shiite militia group and political party), adjacent to Israel's northern border, including the discovery and destruction of attack tunnels from Lebanon into Israel in December 2018 have also contributed to the tension in the region.

Last, relations between Israel and Iran remain hostile, due to the fact that Iran is perceived by Israel as sponsor of Hamas and Hezbollah, while maintaining a military presence in Syria, and also with regard to Iran's nuclear program. During 2018 the parties engaged in military strikes against each other adjacent to Israel's northern border.

All of the above raise a concern as to the stability in the region, which may affect the political and security situation in Israel and therefore could adversely affect our business, financial condition and results of operations.

Furthermore, the continued conflict with the Palestinians is already disrupting some of Israel's trading activities. Certain countries, primarily in the Middle East, but also in Malaysia and Indonesia, as well as certain companies and organizations around the world, continue to participate in a boycott of Israeli brands, doing business with Israel and Israeli companies. The boycott, restrictive laws, policies or practices directed towards Israel or Israeli businesses could, individually or in the aggregate, have a material adverse effect on our business in the future, for example by way of sales opportunities that we could not pursue or from which we will be precluded. Further deterioration of Israel's relations with the Palestinians or countries in the Middle East could expand the disruption of international trading activities in Israel, may materially and negatively affect our business conditions, could harm our results of operations. and adversely affect the Company's share price.

Our business may also be disturbed by the obligation of personnel to perform military service. Our employees who are Israeli citizens are subject to a periodical obligation to perform reserve military service, until they reach the age of 45 (or older, for reservists with certain occupations). During times of a military conflict, these employees may be called to active duty for longer periods of time. In response to the increase in violence and terrorist activity in the past years, there have been periods of significant call-ups for military reservists and it is possible that there will be further military reserve duty call-ups in the future. In case of further regional instability such employees, who may include one or more of our key employees, may be absent for extended periods of time which may materially adversely affect our business.

Furthermore, our Company's insurance does not cover loss arising out of events related to the security situation in the Middle East. While the Israeli government currently covers the reinstatement value of direct damages caused by acts of war or terror attacks, we cannot be certain that such coverage will be maintained.

We can give no assurance that the political, economic and security situation in Israel, will not have a material impact on our business in the future.

We received grants from the IIA (formerly OCS) that may restrict our ability to manufacture products or transfer technologies or know-how outside of Israel.

We have received grants from the Israel Innovation Authority (the "IIA") for the financing of a significant portion of our research and development expenditures in Israel. Even following full repayment of any IIA grants, and unless otherwise agreed by the applicable authority of the IIA, we must nevertheless continue to comply with the requirements of the Encouragement of Industrial Research and Development Law, 1984 and regulations promulgated there under (the "R&D Law"). Accordingly, the transfer of know-how or technologies developed under the programs submitted to the IIA and as to which we received the grants, or manufacturing or rights to manufacture based on and/or incorporating such know-how to third parties, might require the prior consent of the IIA, and may require certain payments of increased royalties to the IIA. Although such restrictions do not apply to the export from Israel of the Company's products developed with such know-how, they may prevent us from engaging in transactions involving product or other asset transfers with our affiliates, customers or other third parties outside Israel, involving product or other asset transfers, which might otherwise be beneficial to us.

For more information regarding such restrictions, please see Item 4. "INFORMATION ON THE COMPANY- B. Business Overview - The Israel Innovation Authority.

The tax benefits to which we are currently entitled from our approved enterprise program and our beneficiary enterprise program, require us to satisfy specified conditions, which, if we fail to meet, would deny us from these benefits in the future. Further, if such tax benefits are reduced or eliminated in the future, we may be required to pay increased taxes.

The Company has capital investment programs that have been granted approved enterprise status by the Israeli government (the “Approved Programs”), and a program under beneficiary enterprise status pursuant to Israel’s Law for the Encouragement of Capital Investments, 1959 (the “Beneficiary Program”). When we begin to generate taxable income from these approved or beneficiary enterprise programs, the portion of our income derived from these programs will be tax exempt for a period of two years. The benefits available to an approved or beneficiary enterprise program are dependent upon the fulfillment of conditions stipulated under applicable law and in the certificates of approval or in rulings obtained from the Israeli Tax Authorities with respect to beneficiary enterprise programs. If we fail to comply with these conditions, in whole or in part, we may be required to pay additional taxes for the period(s) in which we benefited from the tax exemption and would likely be denied these benefits in the future. The amount by which our taxes would increase will depend on the difference between the then-applicable corporate tax rate and the rate of tax, if any, that we would otherwise pay as an approved enterprise or beneficiary enterprise, and on the amount of any taxable income that we may earn in the future.

In addition, the Israeli government may reduce, or eliminate in the future, tax benefits available to approved or beneficiary enterprise programs. Our Approved Programs and Beneficiary Program and the resulting tax benefits may not continue in the future at their current levels or at any level. The termination or reduction of these tax benefits would likely increase our tax liability. The amount, if any, by which our tax liability would increase will depend upon the rate of any tax increase, the amount of any tax rate benefit reduction, and the amount of any taxable income that we may earn in the future. For a description of legislation regarding “Preferred Enterprise” see Item 10. “ADDITIONAL INFORMATION”.

Being a foreign private issuer exempts us from certain SEC and Nasdaq Rule requirements, which may result in less protection than is afforded to investors under rules applicable to domestic issuers.

We are a “foreign private issuer” within the meaning of rules promulgated by the SEC. As such, we are exempt from certain provisions applicable to U.S. public companies, including:

The rules under the Exchange Act requiring the filing with the SEC of quarterly reports on Form 10-Q and current reports on Form 8-K;

The sections of the Exchange Act regulating the solicitation of proxies, consents or authorizations in respect of securities registered under the Exchange Act, including extensive disclosure of compensation paid or payable to certain of our highly compensated executives as well as disclosure of the compensation determination process;

The provisions of Regulation FD aimed at preventing issuers from making selective disclosures of material information; and

The sections of the Exchange Act requiring insiders to file public reports of their stock ownership and trading activities and establishing insider liability for profit realized from any “short-swing” trading transaction (a purchase and sale, or sale and purchase, of the issuer’s equity securities within less than six months).

In addition, we are permitted to follow certain home country corporate governance practices and laws in lieu of certain Nasdaq Rule listing requirements with regard to, among other things, shareholder approval of equity-based incentive plans for our employees and the requirement to have a formal charter for our Compensation Committee. Following our home country governance practices as opposed to the requirements that would otherwise apply to a U.S. company listed on Nasdaq, may provide less protection to investors than is accorded under the Nasdaq Rules applicable to domestic issuers. For more information regarding specific exemptions we chose to adopt, please see “Item 16G. CORPORATE GOVERNANCE.”

We may lose our foreign private issuer status if (a) a majority of our outstanding voting securities are either directly or indirectly owned of record by residents of the United States and (b) one or more of (i) a majority of our executive officers or directors are United States citizens or residents, (ii) more than 50% of our assets are located in the United States or (iii) our business is administered principally in the United States. In such case, we would incur substantial additional internal and external costs, including for outside legal and accounting support.

It may be difficult to enforce a U.S. judgment against us or our officers and directors, or to assert U.S. securities laws claims in Israel.

We are incorporated under the laws of the State of Israel. Service of process upon our directors and officers, almost all of whom reside outside the United States, may be difficult to obtain within the United States. Furthermore, because the majority of our assets and investments, and almost all of our directors and officers are located outside the United States, any judgment obtained in the United States against us or any of them may not be collectible within the United States.





Additionally, it may be difficult for an investor, to assert U.S. securities law claims in original actions instituted in Israel. Israeli courts may refuse to hear a claim based on an alleged violation of U.S. securities laws reasoning that Israel is not the most appropriate forum to bring such a claim. In addition, even if an Israeli court agrees to hear such a claim, it is not certain if Israeli law or U.S. law will be applicable to the claim. If U.S. law is found to be applicable, the content of applicable U.S. law must be proved as a fact by an expert witness, which can be a time-consuming and costly process. Certain matters of procedure will also be governed by Israeli law. There is little binding case law in Israel that addresses the matters described above.

Your rights and responsibilities as a shareholder will be governed by Israeli law which differs in some respects from the rights and responsibilities of shareholders of U.S. companies.

Since we are incorporated under Israeli law, the rights and responsibilities of our shareholders are governed by our Articles of Association and Israeli law. These rights and responsibilities differ in some respects from the rights and responsibilities of shareholders in United States-based corporations. In particular, a shareholder of an Israeli company has a duty to act in good faith and in a customary manner in exercising its rights and performing its obligations towards the company and other shareholders and to refrain from abusing its power in the company, including, among other things, in voting at the general meeting of shareholders on certain matters, such as an amendment to a company's articles of association, an increase of a company's authorized share capital, a merger of a company and approval of related party transactions that require shareholder approval. A shareholder also has a general duty to refrain from discriminating against other shareholders. In addition, a controlling shareholder or a shareholder who knows that it possesses the power to determine the outcome of a shareholders' vote or to appoint or prevent the appointment of an office holder in a company, or has another power with respect to a company, has a duty to act in fairness towards such company. Israeli law does not define the substance of this duty of fairness and there is limited case law available to assist us in understanding the nature of this duty or the implications of these provisions. These provisions may be interpreted to impose additional obligations and liabilities on our shareholders that are not typically imposed on shareholders of U.S. corporations.

Provisions of Israeli law may delay, prevent or make undesirable an acquisition of all or significant portion of our shares or assets.

Israeli corporate law regulates mergers and requires that a tender offer be effected when certain thresholds of percentage ownership of voting power in a company are exceeded (subject to certain conditions). Further, Israeli tax considerations may make potential transactions undesirable to us, or to some of our shareholders, if the country of residence of such shareholder does not have a tax treaty with Israel (thus not granting relief from payment of Israeli taxes). With respect to mergers, Israeli tax law provides tax deferral in certain circumstances but makes the deferral contingent on the fulfillment of numerous conditions, including a holding period of two years from the date of the transaction, during which certain sales and dispositions of shares of the participating companies are restricted. Moreover, with respect to certain share swap transactions, the tax deferral is limited in time, and when such time expires, the tax becomes payable even if no actual disposition of the shares has occurred. See "Item 10.B. - Mergers and Acquisitions under Israeli Law."

In addition, in accordance with the Restrictive Trade Practices Law, 1988, and the R&D Law, to which we are subject due to our receipt of grants from the IIA, approvals regarding a change in control (such as a merger or similar transaction) may be required in certain circumstances. For more information regarding such required approvals please see Item 4. "INFORMATION ON THE COMPANY - B. Business Overview - The Israel Innovation Authority".

These provisions of Israeli law could have the effect of delaying or preventing a change in control and may make it more difficult for a third party to acquire us, or for our shareholders to elect different individuals to our Board of Directors, even if doing so would be beneficial to our shareholders, and may also limit the price that investors may be willing to pay in the future for our ordinary shares.

ITEM 4. INFORMATION ON THE COMPANY

A. History and Development of the Company

We were incorporated under the laws of the State of Israel on July 23, 1996 as Giganet Ltd. We changed our name to Ceragon Networks Ltd. on September 6, 2000. We operate under the Israeli Companies Law, our registered office is located at 24 Raoul Wallenberg Street, Tel Aviv, Israel 69719, and our telephone number is +972-3-543-1000. Our web address is [www.ceragon.com](http://www.ceragon.com). Information contained on our website does not constitute a part of this annual report.

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Our agent for service of process in the United States is Ceragon Networks, Inc., our wholly owned U.S. subsidiary and North American headquarters, located at Overlook at Great Notch, 150 Clove Road, 9th Floor, Little Falls, NJ 07424.

## B. Business Overview

We are the leading wireless backhaul specialist company in terms of unit shipments and global distribution of our business, providing innovative wireless backhaul solutions to global wireless backhaul markets.

Wireless backhaul is a means for connecting mobile network sites (e.g. cellular base stations) to the rest of the network. It carries information to and from the cellular base stations. It is used when high-speed wireline connectivity to telecom sites (typically fiber optics) is not available. According to market research, about 45% of global telecom sites are connected to the rest of the network via wireless backhaul.

Wireless backhaul offers network operators a cost-efficient alternative to wire-line connectivity, mainly fiber optics. Support for high broadband speeds and very large numbers of devices, means that all value-added services can be supported, while the high reliability of wireless systems provide for lower maintenance costs. Because they require no trenching, wireless backhaul links can also be set up much faster and at a fraction of the cost of wire-line solutions. On the operator's side, this translates into an increase in operational efficiency and faster time-to-market, as well as a shorter timetable to achieving new revenue streams.

We provide wireless backhaul solutions and services that enable cellular operators and other service providers to build new networks and evolve networks towards 4G (LTE, LTE-A) and 5G services. The services provided over these networks are: voice, mobile and fixed broadband, Machine-to-Machine (M2M), Internet of Things (IoT) connectivity, public safety and other mission critical services. We also provide our solutions for wireless backhaul to other vertical markets such as Internet service providers, public safety, utilities, oil and gas offshore drilling platforms, as well as maritime communications. Our wireless backhaul solutions use microwave and millimeter-wave radio technologies to transfer large amounts of telecommunication traffic between wireless 5G, 4G, 3G and other cellular base station technologies (distributed, or centralized with dispersed remote radio heads) and the core of the service provider's network. We are also a member of industry consortiums of companies, which attempt to better define future technologies in ICT (Information and Communication Technologies) markets, such as Open Networking Foundation (ONF), Metro Ethernet Forum (MEF), European Telecommunications Standards Institute (ETSI), Telecom Infra Project (TIP) and others.

In addition to providing our solutions, we also offer our customers a comprehensive set of turn-key services, including advanced network and radio planning, site survey, solutions development, network rollout, maintenance, wireless backhaul network audit and optimization, and training. Our services include powerful project management tools that streamline deployments of complex wireless networks, thereby reducing time and costs associated with network set-up and allowing a faster time-to-revenue. Our experienced teams can deploy hundreds of wireless backhaul links every week, and our rollout project track record includes hundreds of thousands of links already installed and operational with a variety of industry-leading operators.

Designed for Internet Protocol (IP) network configurations, including risk-free migration from legacy to next-generation backhaul networks, our solutions provide fiber-like connectivity at any distance, be it a few kilometers or tens of kilometers, and even longer, for next generation IP-based networks, for legacy circuit-switched, or SONET/SDH, networks and for hybrid networks that combine IP and circuit-switching technologies. Our solutions support all wireless access technologies, including 5G-NR NSA, LTE-Advanced-Pro, LTE-Advanced, LTE, HSPA, EV-DO, CDMA, W-CDMA, WIFI and GSM. These solutions allow wireless service providers to cost-effectively and seamlessly evolve their networks from circuit-switched and hybrid concepts to all-IP packet-based concepts, thereby meeting the increasing demand of a growing number of subscribers of any type be those consumers and enterprises with growing needs for mobile and other multimedia services, and a growing number of machines or IoT devices such as street surveillance devices or meters.

We also provide our solutions to other non-carrier vertical markets such as oil and gas companies, public safety organizations, businesses and public institutions, broadcasters, energy utilities and others that operate their own private communications networks. Our solutions are deployed by more than 460 service providers of all sizes, as well as in hundreds of private networks, in more than 130 countries.

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As of December 31, 2018, we have a \$125 million credit agreement with four financial institutions, which was last extended until June 30, 2020. The credit facility provides for a credit line of short-term loans of up to \$40 million and bank guarantees in the sum of up to \$85 million. See Item 5. “OPERATING AND FINANCIAL REVIEW AND PROSPECTS; B. Liquidity and Capital Resources,” for a more detailed discussion.

#### Wireless Backhaul; Short-haul, Long-haul and Small Cells Backhaul

Today’s cellular networks are predominantly based on 4G technologies (3GPP releases of LTE, LTE-Advanced and LTE-Advanced Pro). These networks constantly undergo expansion of coverage, densification with additional sites to cater to higher demands for speeds and to make more services available per given area. According to recent publications, during the last quarter of 2018, in very few countries some wireless service providers have begun rollout of early 5G radio access equipment for network densification purposes, aimed at providing resolution to growing service demands. These investments in 5G radio network infrastructure, and consequently, associated wireless backhaul, are expected to gradually increase during the next several years. In order to allocate spectrum resources for 4G and 5G, some operators even shut down their 2G network in order to re-allocate radio access network frequency bands to 4.5 and 5G services. These market dynamics of network expansion and densification, have resulted in higher demand for wireless backhaul capacity, at increased density, accommodating sophisticated services over the network at far higher volume than available up to recent years. Such services include the many 5G use cases, which among others include enhanced mobile broadband, high-definition mission critical services, IoT, Gigabit broadband to homes, multi Gigabits services to enterprises and more.

The wireless backhaul market is divided into two main market segments. The first is a market segment in which operators invest resources and efforts to select the best wireless backhaul solution that will meet their wireless backhaul needs, in terms of the ability to improve their business operational efficiency, services reliability and their customers’ (subscribers’) quality of experience. This market segment is referred to as “best-of-breed”. The other market segment is characterized by operators that do not select the wireless backhaul solution, since this decision is made by a network’s solution provider retained by the operator. This network solution provider delivers an end-to-end solution and the equipment required to operate the entire network, including the wireless backhaul equipment. Operators in this segment of the market often view the wireless backhaul solution as a “commodity,” which should deliver network connectivity, without optimization of network and other resources, and a solution which does not play a primary role within the end-to-end network rollout considerations. This segment of the market is referred to as bundled-deals.

Ceragon serves the “best-of-breed” segment of the market and specializes in a range of solutions, which we believe provide high value for our customers including:

Shorthaul solutions, which typically provide a wireless link capacity of up to 2 Gbps per link and are used to carry voice and data services over distances of between several hundred feet to 10 miles. Short-haul links are deployed in access applications (macro cells and small cells) wirelessly connecting the individual base-stations and cellular towers to the core network. Short-haul solutions are also used in a range of non-carrier “vertical” applications such as state and local government, public safety, education and off-shore communication for oil and gas platforms.

Long-haul solutions, which typically provide a capacity of up to 20 Gbps, are used in the “highways” of the telecommunication backbone network. These links are used to carry services at distances of 10 to 50 miles, and, using the right planning, configuration and equipment, can also bridge distances of 100 miles. Long-haul solutions are also used in a range of non-carrier “vertical” applications such as broadcast, state and local government, public safety, utilities and off-shore communication for oil and gas platforms.

Ceragon has, on more than one occasion, been the first to introduce new products and features to the market, including the first solution for wireless transmission for evolving cellular networks, providing 155 Mbps at 38 GHz in 1996 and numerous microwave and millimeter-wave technology innovations thereafter. Since 2008, Ceragon has invested in pioneering a new approach to wireless backhaul, named multicore™ technology focusing on addressing the multiple

wireless backhaul challenges of 4G and 5G services. This technology is at the core of Ceragon's in-house developed chipsets for wireless backhaul, which are used to design vertically integrated solutions. With the first products based on multicore™ technology introduced to the market in 2013, Ceragon has enabled dual-core radios and far advanced capabilities, such as Line-of-Sight Multiple Input Multiple Output (LoS MIMO) which allows efficient use of spectrum where congestion of frequencies exist, Advanced Frequency Reuse (AFR) which allows massive network densification and Advanced Space Diversity, which eliminates the use of multiple antennas in various network scenarios, thereby accelerating network deployment and reducing total cost of ownership. Ceragon is currently investing in a new chipset which incorporates 8-cores (Octa-core) in a chipset to be incorporated in products expected to be introduced during 2021 and 2022.

## Industry Background

The market demand for wireless backhaul is being generated primarily by cellular operators, wireless broadband service providers, businesses and public institutions that operate private networks. This market is fueled by the continuous customer growth in developing countries, and the explosion in mobile data usage in developed countries. Traditionally based on circuit-switched solutions such as T1/E1 or SONET/SDH, the market for wireless backhaul has shifted over the past decades, mostly to more flexible higher capacity and cost-efficient architectures, based on IP/Ethernet technologies. The main catalyst of the shift towards IP/Ethernet-based networks as a whole, and the wireless backhaul in particular, has been the vast adoption of 4G services across the globe.

Rapid subscriber growth and the proliferation of advanced smartphones, tablets and other high data consuming devices, driven mainly by video content, have significantly increased the amount of traffic that must be carried over a cellular operator's backhaul infrastructure. As a result, existing transport capacity is heavily strained, creating a bottleneck that hinders service delivery and quality. The proliferation of industrial, security and metering devices through IoT technologies is also expected to increase the total capacity that is needed to be transported throughout networks and put additional strain on network capacity, requiring even higher capacity wireless backhaul connectivity.

With the growth in adoption of 4G/LTE and its subsequent more advanced 3GPP releases, such as LTE-Advanced/Pro, and even more so with the recent introduction of 5G, which require even higher network speeds and wireless backhaul capacity, in particular, cellular operators are seeking strategies, using new technologies, which will allow further business growth, to facilitate quick and cost-efficient enablement of new services for more connected subscribers (either human or machine). Among those are Software Defined Networks (SDN) and Network Function Virtualization (NFV) technologies, which are key for network slicing:

Early deployments of next generation cellular 5G services technologies have already begun according to recent publications and announcements. When fully deployed, 5G networks are expected to serve 1,000-fold increase in subscribers compared to 4G networks. Service rates will range up to 1Gbps. The need for supporting 5G service capacities, along with the support of large-scale deployment of IoT devices in networks, will require wireless backhaul with higher capacity and scalability.

SDN and NFV technologies are key to the network slicing approach, which was introduced in recent years to 4G networks and is expected to grow in complexity and in adoption over 5G networks, which are expected to support a much larger set of services.

Network slicing is a network engineering model in which the physical network is providing resources to numerous virtual networks on top, whereas each virtual network delivers a specific set of performance characteristics for a specific service, or set of services, sharing common requirements. For example, a network slice that is tasked with delivering ultra-high bandwidth for mission critical multimedia services (voice and video) to law enforcement agencies, requires a different amount of network resources ensuring prioritized capacity and minimal delay variation, whereas a different network slice support video streaming service for mobile entertainment. SDN and NFV technologies are designed to support network slicing models and its implementation, for high quality subscriber experience, by simplifying service creation and orchestration through simple network traffic engineering rules and tools, as well as enable end-to-end network resources optimization across all network domains, including the wireless backhaul domain, for increased operational efficiency. Network resources optimization is expected to be achieved, in part, by the use of SDN technologies with wireless backhaul optimization applications, which will exploit network intelligence gathered by SDN controllers within the network.

The wireless backhaul domain of the network will require adaptation to these industry trends by enabling far higher capacities, with ultra-low latency for high service quality, simple service creation and optimization to cope with the influx of a thousand-fold increase in the number of services compared with 4G networks, and a high degree of wireless backhaul resource optimization that will be incorporated within the wireless backhaul network infrastructure.





## Cellular Operators

In order to address the strain on backhaul capacity, cellular operators have a number of alternatives, including leasing existing fiber lines, laying new fiber optic networks or deploying wireless solutions. Leasing existing lines requires a significant increase in operating expenses and, in some cases, requires the wireless service provider to depend on a direct competitor. Laying new fiber-optic lines is capital-intensive and these lines cannot be rapidly deployed. The deployment of high capacity and ultra-high capacity point-to-point wireless links represents a scalable, flexible and cost-effective alternative for expanding backhaul capacity. Supporting data rates of 1 Gbps and above, over a single radio unit, wireless backhaul solutions enable cellular operators to add capacity only as required while significantly reducing upfront and ongoing backhaul costs.

Some of today's backhaul networks, primarily in emerging markets, still employ a large number of circuit switched (or TDM) solutions - whether T1/E1 or high-capacity SDH/SONET. These networks, originally designed to carry voice-only services, have a limited bandwidth capacity and offer a no cost-efficient scalability model. The surge in mobile data usage, fueled by anticipation and adoption of advanced releases of 4G (LTE-Advanced-Pro) and 5G services, drives operators to accelerate and finalize the migration of their networks to a more flexible, feature-rich and cost optimized IP network architecture. Additionally, the surge in data usage in densely populated areas drives operators to explore new network architectures that utilize a variety of small-cell technologies requiring the deployment of dense wireless backhaul network in various microwave and millimeter-wave spectral bands. As operators transition to LTE-Advanced/Pro and 5G services, all of which are IP-based wireless access technologies, they look for ways to benefit from IP technology in the backhaul while maintaining support for their primary legacy services. The progression that is expected in 4G gigabit LTE (most advanced 4G standard using LTE-A-Pro technology) and 5G networks rollout over the next several years, will broaden cellular operators' assessment of the growing role the wireless backhaul may take in their network in 2-3 years' time, as reaching the small cells with more fiber is expected to become a significant challenge.

In order to ensure the success of these backhaul network strategies, as well as preparedness to broaden 4G gigabit LTE and 5G technologies adoption, operators require solutions that can support their legacy transport technology (TDM) while providing all the advanced IP capabilities and functionalities. These solutions should also support a scalable high capacity and flexible full IP network architecture once the transition phase from TDM is completed. Our solutions, which support any network architecture and include both all-IP as well as hybrid (IP and TDM service connectivity) products, offer operators a simple and quick network modernization plan capable of evolving with the transition to 5G services.

## Wireless Broadband Service Providers

For wireless broadband service providers, which offer alternate high data access, high-capacity backhaul is essential for ensuring continuous delivery of rich media service across their high-speed data networks. If the backhaul network and its components do not satisfy the service providers' need for cost-effectiveness, resilience, scalability or ability to supply enough capacity, then the efficiency and productivity of the network may be seriously compromised. While both wireless and wire-line technologies can be used to build these backhaul systems, many broadband service providers opt for wireless point-to-point microwave solutions. This is due to a number of advantages of the technology including: rapid installation, support for high-capacity data traffic, scalability and lower cost-per-bit compared to wire-line alternatives.

## Other Vertical Markets

Many large businesses and public institutions require private high bandwidth communication networks to connect multiple locations. These private networks are typically built using IP-based communications infrastructure. This market includes educational institutions, utility companies, oil and gas industry, broadcasters, state and local

governments, public safety agencies, maritime customers and defense contractors. These customers continue to invest in their private communications networks for numerous reasons, including security concerns, the need to exercise control over network service quality and redundant network access requirements. As data traffic on these networks rises, we expect that businesses and public institutions will continue to invest in their communications infrastructure, including backhaul equipment. Like wireless service providers, customers in this market demand a highly reliable, cost-effective backhaul solution that can be easily installed and scaled to their bandwidth requirements. Approximately 20% of our business is associated with private network operators.

## Wireless vs. Fiber Backhaul

Though fiber-based networks can easily support the rapid growth in bandwidth demands, they carry high initial deployment costs and take longer to deploy than wireless. Certainly, where fiber is available within several hundred feet of the operator's point of presence, with ducts already in place, and when there are no regulatory issues that prohibit the connection – fiber can become the operator's preferred route. In almost all other scenarios, high-capacity wireless backhaul using microwave and millimeter-wave technologies, is significantly more cost efficient. Wireless backhaul is expected to take a significant role in 4G network densification and the transition to 5G rollout as a result of ease and the speed of deployment. In fact, in most cases the return-on-investment from fiber installations can only be expected in the long term, making it hard for operators to achieve lower costs per bit and earn profits in a foreseeable future.

Wireless microwave and millimeter-wave backhaul solutions on the other hand are capable of delivering high bandwidth, carrier-grade Ethernet and TDM services. Our wireless backhaul solutions are suitable for all capacities, carrying multi Gbps of the operators' traffic over a single radio connection (or "link"). Unlike fiber, wireless solutions can be set up quickly and are more cost efficient on a per-bit basis from the outset. In many countries, microwave and millimeter-wave backhaul links are deployed as alternative routes to fiber, ensuring on-going communication in case of fiber-cuts and network failures, as well as enabling the deployment of small cells, as very often fiber is not available or too costly and time consuming to bring to where small cells are required.

## Licensed vs. License-exempt Wireless Backhaul

Licensed wireless backhaul: Service providers select the optimal available transmission frequency based on the rainfall intensity in the transmission area and the desired transmission range. The regulated, or licensed, microwave bands (4 - 42GHz) and millimeter-wave bands (71-86GHz) are allocated by government licensing authorities for high-capacity wireless transmissions. The license grants the licensee the exclusive use of that spectrum for a specific use thereby eliminating any interference issues. A licensed microwave or millimeter-wave spectrum is typically the choice of leading operators around the world because it matches the bandwidth and interference protection they require. Our licensed spectrum products operate across the entire span of the licensed microwave and millimeter-wave spectrum described herein, from 4GHz microwave to 86GHz, delivering multi Gbps per link and are scalable and versatile to meet all radio access networks, small cells, private networks and long-haul radio transmission paths requirements.

License-exempt wireless backhaul: Service providers also select license-exempt spectrum in order to provide high speed connectivity to businesses, campuses (often regarded as a wireless backhaul) and serve cellular small cells with wireless backhaul connectivity, without regulatory approval for spectrum.

License exempt spectrum can be categorized into two main categories: 1) 57 – 66GHz millimeter-wave band, known as the v-band spectrum and operating at very wide channel bandwidths, up to 2,000MHz and capable of delivering 10Gbps bi-directional capacity (FDD), though expected channel bandwidth operations is of 250MHz/500MHz channels which can deliver 1 – 2.5Gbps bi-directional capacity. The use of v-band spectrum requires the existence of a line of sight between the sites, allows the achievement of high availability connectivity because of the narrow beam characteristics of the radio signal and provides the highest capacity when operating in a point-to-point communication mode; and 2) sub 6GHz license-exempt spectrum, operating at narrow channel bandwidths of up to 80MHz and delivering up to 500Mbps bi-directional capacity (FDD), typically in point-to-multipoint communication mode. The use of sub 6GHz spectrum allows for non, or near, line of sight connectivity between the sites and facilitates an economic and flexible rollout model, at the expense of achieving modest capacity, as specified above. License exempt sub 6GHz bands are more vulnerable to interference as a result of the uncoordinated use and wide beam coverage, as well as the air interface implementation that are prevailing in the market. Examples of such spectrum are the 2.4GHz band and the 5.0 – 5.8GHz bands.

We provide a range of license-exempt solutions to provide service providers and private network owners with the solutions that best fit their service and connectivity needs; we provide high availability point-to-point multi Gbps solutions with very low latency for enterprises, campuses and small cells, operating in the license-exempt millimeter-wave v-band spectrum. For those who require modest capacity connectivity of very few hundreds of Mbps per site, we offer third-party equipment vendor solutions operating at license exempt sub 6GHz point-to-multipoint and point-to-point near/non line of sight wireless connectivity that allow them to make reasonable concessions between capacity and latency, service availability and total cost of ownership of the rollout.

## Industry Trends and Developments

LTE-A-Pro, or commonly named Gigabit LTE, and 5G technologies will enable operators to enhance their services portfolio with more use cases such as enhanced mobile broadband (to eMBB – Enhanced Mobile Broadband) delivering gigabit broadband, as well as address new market segments such as IoT and mission critical applications with URLLC (Ultra Reliable Low Latency Communications) and mMTC (Massive Machine Type Communications) services. Those services will require higher capacity networks and in particular higher backhaul capacity, far denser macro cells and small cells grids and the implementation of network virtualization technologies and architectures, namely network slicing using SDN. Our wireless backhaul solutions resolve both higher capacity and network densification requirements with advanced capabilities, based on our multicore™ technology for microwave narrowband spectrum (up to 112Mhz) and the use of wider bands in millimeter-wave spectrum. Network virtualization requirements are addressed with layer 3 capabilities and SDN support.

Software Defined Networking (SDN) is an emerging concept aimed at simplifying network operations and allowing network engineers and administrators to quickly respond to a fast-changing business environment. SDN delivers network architectures that transition networks from a world of task-specific dedicated network devices, to a world of optimization of network performance through network intelligence incorporated within network controllers performing control functions and network devices, which perform traffic (data-plane) transport. Our wireless backhaul solutions are SDN-ready, built around a powerful software-defined engine and may be incorporated within the SDN network architecture. Our SDN architecture is envisioned to provide a set of applications that can achieve end-to-end wireless backhaul network optimization by intelligently making use of the scarce network resources, such as spectrum and power consumption.

The emergence of small cells presents backhaul challenges that differ from those of traditional macro-cells. Small cells can be used to provide a second layer of coverage in 4G/LTE networks, resulting in higher throughput and data rates for the end-user. Larger scale outdoor small cell deployment is anticipated to take place, in a gradual manner, as networks evolve to 5G. Ceragon already offers tailored solutions for forward looking mobile operators. Our small-cell wireless backhaul portfolio includes a variety of compact all-outdoor solutions that provide operators with optimal flexibility in meeting their unique physical, capacity, networking, and regulatory requirements.

The introduction of a disaggregated model for hardware and software. This model allows better scalability, simplicity and flexibility for network operators as it offers independent elements for hardware and software, allowing the use of commercial off-the-shelf hardware, to accelerate delivery of new solutions and innovations.

The network sharing business model is growing in popularity among mobile network operators (MNOs) who are faced with increasing competition from over-the-top players and an ever-growing capacity crunch. Network sharing can be particularly effective in the backhaul portion of mobile networks, especially as conventional macro cells evolve into super-sized macro sites that require exponentially more bandwidth for wireless backhaul. It has become abundantly clear that in these new scenarios, a new breed of wireless backhaul solutions with a significant investment is required. Our wireless backhaul solutions support network sharing concepts by addressing both the ultra-high capacities required for carrying multiple operator traffic, as well as the policing for ensuring that each operator's service level agreement is maintained.

While green-field deployments tend to be all IP-based, the overwhelming portion of network infrastructure investments goes into upgrading, or “modernizing” existing cell-sites to fit new services with a lower total cost of ownership. Modernizing is more than a simple replacement of network equipment. It helps operators build up a network with enhanced performance, capacity and service support. For example, Ceragon offers a variety of innovative mediation devices that eliminate the need to replace costly antennas, which are already deployed. In doing so, we help our customers to reduce the time and the costs associated with network upgrades. The result: a smoother upgrade cycle, short network down-time during upgrades and faster time to revenue.



A growing market for non-mobile backhaul applications which includes: offshore communications for the oil and gas industry, as well as the shipping industry, which require a unique set of solutions for use on moving rigs and vessels; broadcast networks that require robust, highly reliable communication for the distribution of live video content either as a cost efficient alternative to fiber, or as a backup for fiber installations; and Smart Grid networks for utilities, as well as local and national governments that seek greater energy efficiency, reliability and scale.

A growing demand for high capacity, IP-based long-haul solutions in emerging markets where telecom and broadband infrastructure, such as fiber, is lacking. This demand is driven by the need of service providers to connect more communities in order to bridge the digital divide, using 4G and eventually 5G services.

Subscriber growth continues mainly in emerging markets such as India, Africa and Latin America.

## Our Solutions

We offer a broad product portfolio of innovative, field-proven, high capacity wireless backhaul solutions, which incorporate our unique multicore™ technology. Our multicore™ technology is a key element in our differentiation within the wireless backhaul market, serving the “best-of-breed” market segment. Our multicore™ technology is comprised of a high order of digital signal carriers embedded in modems having multiple baseband cores, designed for microwave and millimeter-wave communications, and RF integrated circuits (RFIC), which support the entire available microwave and millimeter-wave spectrum. We integrate our multicore™ technology SoCs into sub-systems and complete wireless backhaul solutions that deliver high value for our customers. With our approach to solutions, from system-on-a-chip design, all the way to solutions design, we enable cellular operators, other wireless service providers, public safety organizations, utility companies and private network owners to effectively obtain a range of benefits:

Increase business operational efficiency by reducing network related expenses. Our customers are able to obtain the required capacity with one-quarter of the spectrum needed otherwise, double network capacity without adding more equipment simply by remotely expanding wireless link capacity, significantly reduce energy related expenses by utilizing our energy efficient products, use smaller antennas thereby reducing telecommunication tower leasing costs, and improve their staff productivity with the use of a single wireless backhaul platform for their long-haul, short-haul and small cells backhaul needs. We offer a range of solutions for quick and simple modernization of wireless networks to 4G LTE, LTE-Advanced/Pro, and 5G network evolution, which significantly contribute to our customers' ability to modernize and expand their service networks.

Our wireless backhaul solutions are offered across the widest range of frequencies - from 4GHz microwaves to 86GHz millimeter-waves. This provides our customer more flexibility in deploying its wireless backhaul infrastructure, as it enables the customer to select the spectrum available in the customer's market, from a wider range of frequencies. Any transport network topology is supported to enable high network availability and resiliency, including ring, mesh, tree and chain topologies.

Enhance service portfolio, quality of experience and reach. Our multicore™ technology allows our customers to introduce new services (e.g. 5G use cases), to improve subscriber (user) quality of experience generated from the voice, data and multimedia services that they provide to their customers and to extend their network and services reach in order to address new markets.

Ensure peace of mind. Our solutions utilize the latest in microwave and millimeter-wave technology, incorporated in-house developed System-on-Chips (baseband and RF integrated circuits), and use the latest advances in SMT (Surface-mount technologies) based manufacturing – allowing our customers to benefit from the highest service availability across their Ceragon-based wireless backhaul network.

We provide our customers with future solutions already built-in to their Ceragon-installed base. We invest a significant amount of effort in designing and providing solutions, which are not only backward compatible with our earlier product generations, but also allow our customers to reuse the radio units and antennas of their Ceragon links installed base, thereby replacing only the low labor-consuming indoor (sheltered) units - thus benefiting from the latest wireless backhaul performance of our latest technology across their Ceragon-installed base. Moreover, our solutions support multiple technologies within the same wireless backhaul equipment, providing our customers with high flexibility in network transition from legacy circuit-based connectivity to 4G and other IP/Ethernet-based connectivity, at their desired pace of transition - while achieving long-term operational efficiency, high service quality and availability.



**Design to Cost.** We see increasing demand for smaller systems with low power consumption and a cost structure that fits today's business environment in the diverse markets, seeking wireless backhaul solutions. We believe that this complicated puzzle can only be solved through vertical integration from system to chip level. Our strategy to drive performance up while driving cost down is achieved through our investment in modem and RF (radio frequency) integrated circuit (IC) design. Our advanced chipsets, which are already in use in hundreds of thousands of units in the field, integrate all the radio functionality required for high-end microwave and millimeter-wave systems. By owning the technology and controlling the complete system design, we achieve a very high level of vertical integration and cost structure and control over the timing of introducing certain capabilities, which is not available to vendors relying on off-the-shelf chipsets. This, in turn, yields systems that have superior performance when compared with systems which use off-the-shelf chipsets component available from the other single source, due to our ability to closely integrate and fine-tune the performance of all the radio components. By significantly reducing the number of components in the system and simplifying its design, we have made our solutions easier to manufacture. We have introduced automated testing that allows us to speed up production while lowering the costs for electronic manufacturing services manufacturers. Thus, we believe we are able to achieve one of the lowest per-system cost positions in the industry and can offer our customers further savings through compact, low power consumption designs – which is becoming a key parameter in the ability of operators to deploy their networks, while meeting operational efficiency targets.

As an example, our FibeAir IP-20C, which is a complete wireless backhaul node, can quadruple the link capacity over a single frequency channel when compared to the capacity that can be achieved over the same single frequency channel by other vendors' solutions. This IP-20C node has nearly the same footprint as our older generation RFU-C which is a single-channel radio unit that Ceragon provides, and is not a full system, but only the RF module of the product. This achievement could not have been possible without our full control of the entire design and production process.

**Strategic Partnerships.** Ceragon maintains strategic partnerships with third party solution vendors and network integrators. Through these relationships Ceragon develops interoperable ecosystems, enabling operators to profitably evolve mobile networks by using complementary backhaul alternatives.

#### Our Products

Our portfolio of products utilizes microwave and millimeter-wave radio technologies that provide our customers with a wireless connectivity that dynamically adapts to weather conditions and optimizes range and efficiency for a given frequency channel bandwidth. Our products are typically sold as a complete system comprised of four components: an outdoor unit, an indoor unit, a compact high-performance antenna and a network management system. We offer all-packet microwave and millimeter-wave radio links, with optional migration from TDM to Ethernet. Our products include integrated networking functions for both TDM, Ethernet and IP/MPLS.

We offer our products in four configurations: All-outdoor, split-mount, all-indoor, and disaggregated backhaul.

All-outdoor solutions combine the functionality of both the indoor and outdoor units in a single, compact device. This weather-proof enclosure is fastened to an antenna, eliminating the need for rack space or sheltering, as well as the need for air conditioning.

Split-mount solutions consist of:

- Ø Indoor units which are used to process and manage information transmitted to and from the outdoor unit, aggregate multiple transmission signals and provide a physical interface to wire-line networks.

- Ø Outdoor units or Radio Frequency Units (RFU), which are used to control power transmission, and provide an interface between antennas and indoor units. They are contained in compact weather-proof

enclosures fastened to antennas. Indoor units are connected to outdoor units by standard coaxial or Cat-5 baseband cables.

All-indoor solutions refer to solutions in which the entire system (indoor unit and RFU) reside in a single rack inside a transmission equipment room. A waveguide connection transports the radio signals to the antenna mounted on a tower. All indoor equipment is typically used in long-haul applications.

Disaggregated wireless backhaul solutions offer a single radio suitable for all-outdoor a split-mount scenario, and a networking unit, which provides versatile and scalable hardware options based on merchant silicon and will also provide routing capabilities that are radio technologies aware.

Pointing accuracy solutions for high vibration environments. These are advanced microwave radio systems for use on moving rigs/vessels where the antenna is stabilized in one or two axes, azimuth or azimuth/elevation.

Antennas are used to transmit and receive microwave radio signals from one side of the wireless link to the other. These devices are mounted on poles typically placed on rooftops, towers or buildings. We rely on third party vendors to supply this component.

End-to-End Network Management. Our network management system uses standard management protocol to monitor and control managed devices at both the element and network level and can be easily integrated into our customers' existing network management systems.

The IP-20 Platform provides a wide range of solutions for any configuration requirement and diverse networking scenarios. Composed of high-density multi-technology nodes and integrated radio units of multiple radio technologies ranging from 4GHz and up to 86GHz, it offers ultra-high capacity of multiple Gbps with flexibility in accommodating for every site providing high performance terminals for all-indoor, split-mount and all-outdoor configurations. The IP-20 platform supports carrier-ethernet services and is MEF 2.0 certified.

The IP-50 Platform provides disaggregated wireless backhaul using a single type of radio in microwave or millimeter-wave for all configuration and installation scenarios and IP/MPLS and segment routing capabilities over merchant silicon hardware options.

IP-20 All-outdoor solutions:

Product	Frequency range	Application	Networking & transport technologies
IP-20C	6-42GHz	Shorthaul, small cells, enterprise	Carrier Ethernet
IP-20C-HP	4-11GHz	Longhaul	Carrier Ethernet
IP-20S	6-42GHz	Shorthaul, enterprise	Carrier Ethernet
IP-20E	71-86GHz	Shorthaul, small cells, enterprise	Carrier Ethernet
IP-20V	57-66GHz	Shorthaul, small cells, enterprise	Carrier Ethernet

IP-20 Split-mount / all-indoor solutions:

Product	Frequency range	Application	Networking & transport technologies
IP-20N / IP-20A	4-86GHz	Shorthaul, Long-haul	Carrier Ethernet, TDM
IP-20GX	4-86GHz	Shorthaul	Carrier Ethernet, TDM
IP-20F	4-86GHz	Shorthaul	Carrier Ethernet, TDM
IP-20G	6-42GHz	Shorthaul	Carrier Ethernet, TDM



IP-50 disaggregated solutions:

Product	Frequency range	Application	Networking & transport technologies
IP-50E	71-86GHz	Shorthaul, Fronthaul, Enterprise access	IP/MPLS
IP-50C	6-42GHz	Shorthaul	IP/MPLS
IP-50FX	6-86GHz	Shorthaul	IP/MPLS

As wireless backhaul capacity needs grow, the wireless backhaul network blueprint evolves to supporting more radio carriers in one box (2 carriers, instead of 1) as a basic configuration with the IP-20C product, or even 4+0 (a link utilizing 4-carriers in a carrier-aggregation configuration) in all-outdoor configuration with layer-1 carrier aggregation to support growing capacity needs at minimal foot print with the IP-50C product. Ceragon's multicore™ technology covers all network scenarios and site configurations wherever All-outdoor, Split-mount, or All-indoor. Various multicore™ radio units can be used with IP-20N, IP-20F or IP-50FX products, such as RFU-D and the RFU-D-HP, or IP-50C and IP-50E in the disaggregated solution (i.e. can be used as a stand-alone, all-outdoor radio or in a split-mount configuration, connected to the IP-50FX).

In addition to the IP-20 and the IP-50 Platforms, Ceragon provides the PointLink portfolio that offers a tailored solution for oil and gas and other maritime offshore applications.

Our network management system (NMS) can be used to monitor network element status, provide statistical and inventory reports, download software and configuration to elements in the network, and provide end-to-end service management across the network. Our NMS solutions support all our microwave and millimeter-wave products through a single user interface.

Our IP-based network products use native IP technology. Our hybrid products use our hybrid concept, which allows them to transmit both native IP and native circuit-switched TDM traffic simultaneously over a single radio link. Native IP refers to systems that are designed to transport IP-based network traffic directly rather than adapting IP-based network traffic to existing circuit-switched systems. This approach increases efficiency and decreases latency. Our products provide effectively seamless migration to gradually evolve the network from an all circuit-switched and hybrid concept to an all IP-based packet.

As telecommunication networks and services become more demanding, there is an increasing need to match the indoor units' advanced networking capabilities with powerful and efficient radio units. Our outdoor RFUs are designed with sturdiness, power, simplicity and compatibility in mind. As such, they provide high-power transmission for both short and long distances and can be assembled and installed quickly and easily. The RFUs can operate with different Ceragon indoor units, according to the desired configuration, addressing any network need be it cellular, backbone, rural or private backhaul networks.

## Our Services

We are responsible for installing some of the links we ship. We offer complete solutions and services for the design and implementation of telecommunication networks, as well as the expansion or integration of existing ones. We have a global projects and services group that operates alongside our products groups. Under this group we offer our customers a comprehensive set of turn-key services including: advanced network and radio planning, site survey, solutions development, installation, maintenance, training and more. Our services include utilization of powerful project management tools in order to streamline deployments of complex wireless networks, thereby reducing time and costs associated with network set-up, and allowing faster time to revenue. Our experienced teams can deploy hundreds of "wireless backhaul links" every week, and our rollout project track-record includes hundreds of thousands

of links already installed and in operation with a variety of Tier 1 operators.

We are committed to providing high levels of service and implementation support to our customers. Our sales and network field engineering services personnel work closely with customers, system integrators and others to coordinate network design and ensure successful deployment of our solutions.

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We support our products with documentation and training courses tailored to our customers' varied needs. We have the capability to remotely monitor the in-network performance of our products and to diagnose and address problems that may arise. We help our customers to integrate our network management system into their existing internal network operations control centers.

#### Our Customers

We have sold our products, directly and through a variety of channels, to over 460 service providers and more than 1,000 private network customers in more than 130 countries. Our principal customers are wireless service providers that use our products to expand backhaul network capacity, reduce backhaul costs and support the provision of advanced telecommunications services. In 2018, we continued to maintain our position as the number one wireless backhaul specialist, in terms of unit shipments and global distribution of our business. While most of our sales are direct, we do reach a number of these customers through OEM or distributor relationships. We also sell systems to large enterprises and public institutions that operate their own private communications networks through system integrators, resellers and distributors. Our customer base is diverse in terms of both size and geographic location.

In 2018, customers from the Europe region contributed 11% of total yearly revenue. Our sales in Latin America and Africa in 2018 were 18% and 7% of yearly revenue, respectively. Our sales in Asia Pacific (excluding India), North America and India in 2018 were 14%, 12% and 38%, respectively.

The following table summarizes the distribution of our revenues by region, stated as a percentage of total revenues for the years ended December 31, 2016, 2017 and 2018:

Region	Year Ended			
	December 31,			
	2016	2017	2018	
North America	14%	12%	12%	%
Europe	15%	14%	11%	%
Africa	7%	4%	7%	%
India	27%	39%	38%	%
APAC (excluding India)	10%	13%	14%	%
Latin America	27%	18%	18%	%

#### Sales and Marketing

We sell our products through a variety of channels, including direct sales, OEMs, resellers, distributors and system integrators. Our sales and marketing staff, including supporting functions, includes approximately 551 employees in many countries worldwide, who work together with local agents, distributors and OEMs to expand our business.

We are a supplier to various key OEMs which together accounted for approximately 4% of our revenues in 2018. System integrators, distributors and resellers accounted for approximately 17% of our revenues in 2018. We are focusing our efforts on direct sales, which accounted for approximately 79% of our revenues in 2018. We also plan to develop additional strategic relationships with equipment vendors, system integrators, distributors, resellers, networking companies and other industry suppliers with the goal of gaining greater access to our target markets.

Our marketing efforts include digital marketing campaigns, advertising, public relations and participation in industry trade shows and conferences.

#### Manufacturing and Assembly

Our manufacturing process consists of materials planning and procurement, assembly of indoor units and outdoor units, final product assurance testing, quality control and packaging and shipping. With the goal of streamlining all manufacturing and assembly processes, we have implemented an outsourced, just-in-time manufacturing strategy that relies on contract manufacturers to manufacture and assemble circuit boards and other components used in our products and to assemble and test indoor units and outdoor units for us. The use of advanced supply chain techniques has enabled us to increase our manufacturing capacity, reduce our manufacturing costs and improve our efficiency.



We outsource most of our manufacturing operations to major contract manufacturers in Israel, Singapore and Ukraine. Additionally, in December 2017 we closed our manufacturing activities in the Philippines. Most of our warehouse operations are outsourced to subcontractors in Israel, the Netherlands, the United States and Singapore. The raw materials (components) for our products come primarily from the United States, Europe and Asia Pacific.

We comply with standards promulgated by the International Organization for Standardization and have received certification under the ISO 9001, ISO 14001, ISO 27001 and OHSAS 18001 standards. These standards define the procedures required for the manufacture of products with predictable and stable performance and quality, as well as environmental guidelines for our operations and safety assurance.

Our activities in Europe require that we comply with European Union Directives with respect to product quality assurance standards and environmental standards including the “RoHS” (Restrictions of Hazardous Substances) Directive.

### Research and Development

We place considerable emphasis on research and development to improve and expand the capabilities of our existing products, to develop new products, with particular emphasis on equipment for increasing the transmitted capacity and effective bandwidth utilization, and to lower the cost of producing both existing and future products. We intend to continue to devote a significant portion of our personnel and financial resources to research and development. As part of our product development process, we maintain close relationships with our customers to identify market needs and to define appropriate product specifications. In addition, we intend to continue to comply with industry standards and we are full members of the European Telecommunications Standards Institute in order to participate in the formulation of European standards.

Our research and development activities are conducted mainly at our facilities in Tel Aviv, Israel, but also at our subsidiaries in Greece and Romania. As of December 31, 2018, our research, development and engineering staff consisted of 210 employees. Our research and development team includes highly specialized engineers and technicians with expertise in the fields of millimeter-wave design, modem and signal processing, data communications, system management and networking solutions.

Our research and development department provides us with the ability to design and develop most of the aspects of our proprietary solutions, from the chip-level, including both application specific integrated circuits, or ASICs and RFICs, to full system integration. Our research and development projects currently in process include extensions to our leading IP-based networking product lines and development of new technologies to support future product concepts. In addition, our engineers continually work to redesign our products with the goal of improving their manufacturability and testability while reducing costs.

To further expand global business footprint, Ceragon has recently entered into an agreement with a leading industry partner. The agreement calls for a development program, wherein the companies will leverage Ceragon’s experience and unique capabilities in microwave and millimeter-wave communications, to develop baseband technologies, which will further accelerate innovation and deliver premium cutting-edge solutions for 5G wireless backhaul.

### Intellectual Property

To safeguard our proprietary technology, we rely on a combination of patent, copyright, trademark and trade secret laws, confidentiality agreements and other contractual arrangements with our customers, third-party distributors, consultants and employees, each of which affords only limited protection. We have a policy which requires all of our employees to execute employment agreements which contain confidentiality provisions.



To date, we have 19 patents granted in the United States and other foreign jurisdictions including the EPO (European Patent Office) and 2 patent applications pending in the United States and other foreign jurisdictions including the EPO.

We have registered trademarks as follows:

- for the standard character mark Ceragon Networks and our logo in the United States, Israel, and the European Union;
- for the standard character mark Ceragon Networks in Canada;
- for the standard character mark CERAGON in Morocco, Malaysia, Indonesia, Japan, Russia, Israel, Mexico, the United States, South Africa, the Philippines, Argentina, Venezuela and Colombia and International Registration (protection granted in Australia, Iceland, Bosnia & Herzegovina, Switzerland, Croatia, Norway, Russia, China, Ukraine, CTM (European Union), Turkey, Singapore, and Macedonia);
- for our design mark for FibeAir in the United States, Israel and the European Union;
- for the standard character mark FibeAir in the United States;
- for the standard character mark CeraView in Israel and the European Union.

We have pending trademark applications for the standard character mark CERAGON in India, Peru, Canada, Nigeria, and International Registration (protection pending in Egypt, Kenya and Vietnam).

#### Competition

The market for wireless equipment is rapidly evolving, fragmented, highly competitive and subject to rapid technological change. We expect competition, which may differ from region to region, to persist, intensify and increase in the future - especially if rapid technological developments occur in the broadband wireless equipment industry or in other competing high-speed access technologies.

We compete with a number of wireless equipment providers worldwide that vary in size and in the types of products and solutions they offer. Our primary competitors include large wireless equipment manufacturers referred to as generalists, such as Huawei Technologies Co., Ltd., L.M. Ericsson Telephone Company, NEC Corporation, Nokia and ZTE Corporation. In addition to these primary competitors, a number of other smaller wireless backhaul equipment suppliers, including Aviat Networks Inc., SIAE Microelectronica S.p.A, and Intracom telecom offer or develop products that compete with our products.

We also expect consolidation to continue as the wireless equipment market continues to be highly competitive and, as a result, we face strong price pressures. We expect to continue to be a leader in the “best-of-breed” segment of the wireless backhaul market in terms of market share, technology and innovation, providing significant value to our customers.

We expect that continued market pressures will drive further consolidation within equipment manufacturers competing with us and which focus solely on the “best-of-breed” segment of the wireless backhaul market. Examples of such previous consolidations are our acquisition of Nera Network AS in 2011 (the “Nera Acquisition”), the acquisition by Dragonwave of the wireless division of Nokia (formerly NSN), and the merger of the wireless divisions of Harris and Stratex Networks to create Aviat Networks, Inc.

We expect further consolidations will take place within the generalists. The most recent is the merger between Nokia and Alcatel-Lucent with Nokia itself being the result of a previous joint venture between Nokia and Siemens, and

Alcatel-Lucent being the result of a previous merger between Alcatel and Lucent.

Further market consolidations among industry generalists may drive some operators, which seek “best-of-breed” solutions, to seek “bundled” network solutions from these generalists. This trend may put an additional strain on our competitiveness.

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We believe we compete favorably on the basis of:

- our focus on the mobile market and active involvement in shaping next generation standards and technologies, which deliver best customer value;
- our product performance, reliability and functionality, which assist our customers to achieve the highest value;
- the range and maturity of our product portfolio, including the ability to provide solutions in every widely available microwave and millimeter-wave licensed and license-exempt frequency, as well as our ability to provide both IP and circuit switch solutions and therefore to facilitate a migration path for circuit-switched to IP-based networks;
- our cost structure;
- our focus on high-capacity, point-to-point microwave technology, which allows us to quickly adapt to our customers' evolving needs;
- the range of rollout services offering for faster deployment of an entire network and reduced total cost of ownership;
- our support and technical service, experience and commitment to high quality customer service, and
- our ability to expand to other vertical markets such as oil and gas and public safety, by drawing upon the capabilities of our technologies and solutions.

Our products also indirectly compete with other high-speed communications solutions, including fiber optic lines and other wireless technologies.

The Israel Innovation Authority.

The government of Israel encourages research and development projects in Israel through the IIA (Israel Innovation Authority), formerly known as the Israeli Office of Chief Scientist, pursuant to and subject to the provisions of the R&D Law. We received grants from the IIA for several projects, and may receive additional grants in the future.

Under the terms of the certain grants, a company may be required to pay royalties ranging between 3% to 6% of the revenues generated from its products or services incorporating know-how developed with, or are a derivative of, funds received from the IIA ("IIA Products"), until 100% of the dollar value of the grant is repaid (plus LIBOR interest applicable to grants received on or after January 1, 1999).

The R&D Law requires that the manufacturing of IIA Products be carried out in Israel, unless the IIA provides its approval to the contrary. Such approval may only be granted under various conditions, and entails repayment of increased royalties equal to up to 300% of the total grant amount, plus applicable interest, depending on the extent of the manufacturing that is to be conducted outside of Israel. In any case, IIA Products manufactured abroad carry an increase of 1% in the royalty rate.

The R&D Law also provides that know-how (and its derivatives) developed with, or that is a derivative of, funds received from the IIA and any right derived therefrom may not be transferred to third parties, unless such transfer was approved in accordance with the R&D Law. The research committee operating under the IIA may approve the transfer of know-how between Israeli entities, provided that the transferee undertakes all the obligations in connection with the R&D grant as prescribed under the R&D Law. In certain cases, such research committee may also approve a transfer of know-how outside of Israel, in both cases subject to the receipt of certain payments, calculated according to a formula set forth in the R&D Law, in amounts of up to six (6) times the total amount of the IIA grants, plus applicable

interest (in case of transfer outside of Israel), and three (3) times of such total amount, plus applicable interest, (in case sufficient R&D activity related to the know how remains in Israel). Such approvals are not required for the sale or export of any products resulting from such R&D activity.

Further, the R&D Law imposes reporting requirements on certain companies with respect to changes in the ownership of a grant recipient. The grant recipient, its controlling shareholders, and foreign interested parties of such companies must notify the IIA of any change in control of the grant's recipient or the holdings of the "means of control" of the recipient that result in an Israeli or a non-Israeli becoming an interested party directly in the recipient. The R&D Law also requires the new interested party to undertake to comply with the R&D Law. For this purpose, "control" means the ability to direct the activities of a company (other than any ability arising solely from serving as an officer or director of the company), including the holding of 25% or more of the "means of control", if no other shareholder holds 50% or more of such "means of control." "Means of control" refers to voting rights or the right to appoint directors or the chief executive officer. An "interested party" of a company includes a holder of 5% or more of its outstanding share capital or voting rights, its chief executive officer and directors, someone who has the right to appoint its chief executive officer or at least one director, and a company with respect to which any of the foregoing interested parties owns 25% or more of the outstanding share capital or voting rights or has the right to appoint 25% or more of the directors. Accordingly, in certain cases, any non-Israeli who acquires 5% or more of our ordinary shares may be required to notify the IIA that it has become an interested party and to sign an undertaking to comply with the R&D Law. In addition, the rules of the IIA may require additional information or representations with respect to such events.

In December 2006, we entered into an agreement with the IIA to conclude our R&D grants sponsored by the IIA, and by 2008 completed paying all debts remaining therefrom. In 2014 and 2015 we received approval for new R&D grants from the Government of Israel through the IIA in amounts of approximately \$0.9 million and \$0.6 million respectively. In 2016, 2017 and 2018 we received approval for grants in a total amount for the three years, of approximately \$1.4 million (together the “Generic Plan”). In 2019, we received approval for an additional Generic Plan, in the frame of which we expect to receive \$ 0.5 million. The Generic Plan requires us to comply with the requirements of the R&D Law in the same manner applicable to previous grants, provided, however, that the obligation to pay royalties on sales of products based on technology or know how developed with the Generic Plan does not apply to us, but may apply, under certain conditions, to a recipient of the technology or know-how developed with the Generic Plan, to the extent such is sold and/or transferred. In addition, we may manufacture part of the products developed under the program outside of Israel, up to the percentages declared in our applications for such grants.

In addition to the grants described above, in March 2014, we agreed to participate in two “Magnet” Consortium Programs (the “Magnet Programs”) sponsored by the IIA, and a generic program, which grants do not bear royalty payment obligations. In the framework of the Magnet Programs, intended to support innovative generic industry-oriented technologies, we are to cooperate with additional companies and research institutes. With respect to the years, 2016, 2017 and 2018 we received an approval from the IIA for a sum of \$3.8 million in the aggregate under the Magnet Programs. The R&D Law applies to the Magnet Programs, including the restrictions on transfer of know how or manufacturing outside of Israel, as described above. In addition, certain restrictions resulting from Magnet Programs’ internal agreements between the consortium members may apply.

### C. Organizational Structure

We are an Israeli company that commenced operations in 1996. The following is a list of our significant subsidiaries:

Company	Place of Incorporation	Ownership Interest	
Ceragon Networks, Inc.	New Jersey	100	%
Ceragon Networks (India) Private Limited	India	100	%

### D. Property, Plants and Equipment

Our corporate headquarters and principal administrative, finance and operations departments are located at a leased facility of approximately 67,500 square feet of office space and approximately 9,300 square feet of warehouse space, in Tel Aviv, Israel. The leases of this space will expire on December 31, 2019. In the beginning of 2019, the agreement was extended until end of December 2020.

We also lease the following space at the following properties:

in the United States, we lease approximately 5,300 square feet of premises in Overlook at Great Notch, New Jersey, expiring September 2021 and approximately 8,200 square feet of office and warehouse space in Richardson, Texas, expiring March 2024.

in India, we lease approximately 11,700 square feet of office space in New Delhi, expiring in October 2019. In addition, we lease 1,348 square feet of office space in Mumbai, expiring in July 2020.

in Romania, we lease approximately 20,000 square feet of office and space in Bucharest, Romania, expiring in November 2020.

We also lease space for other local subsidiaries to conduct pre-sales and marketing activities in their respective regions.

#### ITEM 4A. UNRESOLVED STAFF COMMENTS

Not applicable.

#### ITEM 5. OPERATING AND FINANCIAL REVIEW AND PROSPECTS

The following discussion and analysis should be read in conjunction with our consolidated financial statements, the notes to those financial statements, and other financial data that appear elsewhere in this annual report. In addition to historical information, the following discussion contains forward-looking statements based on current expectations that involve risks and uncertainties. Actual results and the timing of certain events may differ significantly from those projected in such forward-looking statements due to a number of factors, including those set forth in “Risk Factors” and elsewhere in this annual report. Our consolidated financial statements are prepared in conformity with U.S. GAAP.

##### A. Operating Results

###### Overview

We are the number one wireless backhaul specialist in terms of unit shipments and global distribution of our business. We provide wireless backhaul solutions that enable cellular operators and other wireless service providers to deliver mobile broadband services. Our wireless backhaul solutions use microwave and millimeter wave technology to transfer large amounts of telecommunication traffic between base stations and small-cells and the core of the service provider’s network.

We also provide our solutions to other non-carrier vertical markets such as oil and gas companies, public safety network operators, businesses and public institutions, broadcasters, energy utilities and others that operate their own private communications networks. Our solutions are deployed by more than 460 service providers, as well as more than 1,000 private network owners, in over 130 countries.

###### Industry Trends

Market trends have placed, and will continue to place, pressure on the selling prices for our products. Our objective is to continue to meet the demand for our solutions while at the same time increasing our profitability. We seek to achieve this objective by constantly reviewing and improving our execution in, among others, development, manufacturing and sales and marketing. Set forth below is a more detailed discussion of the trends affecting our business:

Deployments of Gigabit-LTE as an interim phase ahead of 5G deployment and gradual introduction of 5G services. This enables enhanced mobile broadband (eMBB) services, industrial, IOT and mission critical services.

- A growing number of global wireless subscribers. Growth in the number of global wireless subscribers is driven by the availability of inexpensive cellular phones and more affordable wireless service, particularly in developing countries and emerging markets, and is being addressed by expanding wireless networks and by



building new networks. Additionally, in developed countries, subscriber growth is expected over the next several years as 4G gigabit LTE deployments intensify and 5G deployments initiate, and machines and IoT devices are expected to drive the introduction of new services and bring for proliferation of 1,000 fold of service connections from these subscribed devices.

Increasing demand for mobile broadband services. Cellular operators and other wireless service providers are facing increasing demand from subscribers to deliver voice and data services, including Internet browsing, music and video applications.

The emergence of small cells in particular markets (North America, Asia Pacific) present wireless backhaul challenges that differ from those of traditional macro-cells. Small cells architectures can be used to provide a second layer of coverage in 4G and, in the future, 5G networks, resulting in higher throughput and data rates for the end-user. While adoption by some service providers in North America and Asia Pacific, other service providers around the globe and which have previously considered the deployment of 4G small cells have come to the conclusion that the benefit of additional coverage and capacity versus the required investment, does not provide significant value and hence have deferred the consideration of small cells radio access network to a time in which 5G radio access networks shall be considered.

Transition to IP-based networks. Cellular operators and other wireless service providers are deploying all-IP networks and upgrading their infrastructure to interface with an IP-based core network in order to increase network efficiency, lower operating costs and more effectively deliver high-bandwidth data services.

Software Defined Networking (SDN) deliver network architectures that transition networks from a world of task-specific dedicated equipment elements, to a world of service creation and optimization of network performance through network intelligence.

Network sharing business models are being adopted by mobile network operators (MNOs) who are faced with increasing competition from over-the-top players and an ever-growing capacity crunch. Network sharing can be particularly effective in the backhaul portion of mobile networks, especially as conventional macro cells evolve into super-sized macro sites that require exponentially more bandwidth for backhaul.

We are also experiencing pressure on our sale prices as a result of several factors:

Increased competition. Our target market is characterized by vigorous, worldwide competition for market share and rapid technological development. These factors have resulted in aggressive pricing practices and downward pricing pressures, and growing competition from both start-up companies and well-capitalized telecommunication systems providers.

Regional pricing pressures. A significant portion of our sales derives from India, in response to the rapid build-out of cellular networks in that country. For the years ended December 31, 2016, 2017 and 2018, 27.3%, 39.2% and 38.2%, respectively, of our revenues were earned in India. Sales of our products in these markets are generally at lower gross margins in comparison to other regions. Recently, network operators have started to share parts of their network infrastructure through cooperation agreements, which may adversely affect demand for network equipment.

Transaction size. Competition for larger equipment orders is increasingly intensifying due to the fact that the number of large equipment orders in any year is limited. Consequently, we generally experience greater pricing pressure when we compete for larger orders as a result of this increased competition and demand from purchasers for greater volume discounts. As an increasing portion of our revenues is derived from large orders, we believe that our business will be more susceptible to these pressures.

As we continue to focus on operational improvements, these price pressures may have a negative impact on our gross margins.

As we continue to adjust our geographic footprint, we are increasingly engaged in supplying installation and other services for our customers, often in emerging markets. In this context, we may act as the prime contractor and equipment supplier for network build-out projects, providing installation, supervision and commissioning services

required for these projects, or we may provide such services and equipment for projects handled by system integrators. In such cases, we typically bear the risks of loss and damage to our products until the customer has issued an acceptance certificate upon successful completion of acceptance tests. If our products are damaged or stolen, or if the network we install does not pass the acceptance tests, the end user or the system integrator, as the case may be, could delay payment to us and we would incur substantial costs, including fees owed to our installation subcontractors, increased insurance premiums, transportation costs and expenses related to repairing or manufacturing the products. Moreover, in such a case, we may not be able to repossess the equipment, thus suffering additional losses. Also, these projects are rollout projects, which involve fixed-price contracts. We assume greater financial risks on fixed-price projects, which routinely involve the provision of installation and other services, versus short-term projects, which do not similarly require us to provide services or require customer acceptance certificates in order for us to recognize revenue.

During 2014 and 2015, there was no material difference in our revenues. In 2016, our revenues decreased due to the strategy we implemented in order to accelerate our return to profitability, which included: managing the revenue mix more carefully, seeking revised pricing, payment and other terms in certain new orders and our business focus on service providers that seek to resolve their wireless backhaul challenges through solutions, which create higher business value and are willing to pay a premium in order to create this value. In 2017 revenues increased mainly due to an increase in the business from our customers in India and to a lesser extent an expansion of our business in the rest of APAC. In 2018, revenues increased primarily due to an increase in Africa and to a lesser extent in other regions offset by a decrease in Europe.

#### Results of Operations

**Revenues.** We generate revenues primarily from the sale of our products, and, to a lesser extent, services. The final price to the customer may largely vary based on various factors, including but not limited to the size of a given transaction, the geographic location of the customer, the specific application for which products are sold, the channel through which products are sold, the competitive environment and the results of negotiation.

**Cost of Revenues.** Our cost of revenues consists primarily of the prices we pay contract manufacturers for the products they manufacture for us, the costs of off the shelf parts, accessories and antennas, the costs of our manufacturing facility, estimated warranty costs, costs related to management of our manufacturing facility, supply chain and shipping, as well as inventory write-off costs, depreciation of equipment and software, and amortization of intangible assets. In addition, we pay salaries and related costs to our employees and fees to subcontractors relating to installation services with respect to our products.

#### Significant Expenses

**Research and Development Expenses, net.** Our research and development expenses consist primarily of salaries and related costs for research and development personnel, subcontractors' costs, costs of materials, software maintenance and depreciation of equipment. All of our research and development costs are expensed as incurred, except for development expenses, which were capitalized in accordance with ASC 985-20 "Software – Costs of Software to be Sold, Leased, or Marketed". We believe that continued investment in research and development is essential to attaining our strategic objectives.

**Selling and Marketing Expenses.** Our selling and marketing expenses consist primarily of compensation and related costs for sales marketing and sales support functions personnel, amortization of intangible assets, trade show and exhibit expenses, travel expenses, commissions and promotional materials.

**General and Administrative Expenses.** Our general and administrative expenses consist primarily of compensation and related costs for executive, finance, information system and human resources personnel, professional fees (including legal and accounting fees), insurance, provisions for doubtful accounts, depreciation of equipment and software and other general corporate expenses.

**Financial expenses, net.** Our financial expenses, net, consists primarily of interest paid on bank debts, factoring and discounting fees, gains and losses arising from the re-measurement of transactions and balances denominated in non-dollar currencies into dollars, gains and losses from our currency hedging activity, and other fees and commissions paid to banks primarily for bank guarantees and unutilized credit facilities, offset by interest earned on bank deposits and marketable securities.

**Taxes.** Our taxes on income (benefit) consist of current corporate tax expenses in various locations and changes in tax deferred assets and liabilities, as well as reserves for uncertain tax positions.



## Critical Accounting Policies and Estimates

Our consolidated financial statements are prepared in accordance with generally accepted accounting principles in the U.S. (“U.S. GAAP”). These accounting principles require management to make certain estimates, judgments and assumptions based upon information available at the time they are made, historical experience and various other factors that are believed to be reasonable under the circumstances. These estimates, judgments and assumptions can affect the reported amounts of assets and liabilities as of the date of the financial statements, as well as the reported amounts of revenues and expenses during the periods presented.

Our management believes the accounting policies that affect its more significant judgments and estimates used in the preparation of its consolidated financial statements and which are the most critical to aid in fully understanding and evaluating our reported financial results include the following:

Revenue recognition;

Inventory valuation; and

Provision for doubtful accounts.

**Revenue recognition** We generate revenues from selling products and services to end users, distributors, system integrators and original equipment manufacturers (“OEM”). The Company recognizes revenue when (or as) it satisfies performance obligations by transferring promised products or services to its customers in an amount that reflects the consideration the Company expects to receive. The Company applies the following five steps: (1) identify the contract with a customer, (2) identify the performance obligations in the contract, (3) determine the transaction price, (4) allocate the transaction price to the performance obligations in the contract, and (5) recognize revenue when a performance obligation is satisfied.

The Company considers customer purchase orders, which in some cases are governed by master sales agreements, to be the contracts with a customer. For each contract, the Company considers the promise to transfer tangible products, network roll-out, professional services and customer support, each of which are distinct, to be the identified performance obligations. In determining the transaction price, the Company evaluates whether the price is subject to rebates and adjustments, to determine the net consideration which the Company expects to receive. As the Company’s standard payment terms are less than one year, the contracts have no significant financing component. The Company allocates the transaction price to each distinct performance obligation, based on their relative standalone selling price. Revenue from tangible products is recognized when control of the product is transferred to the customer (i.e., when the Company’s performance obligation is satisfied).

The revenues from customer support is recognized ratably over the contract period and the costs associated with these contracts are recognized as incurred. Revenues from network roll-out and professional services are recognized when the Company’s performance obligation is satisfied, usually upon customer acceptance.

Most of the Company’s distributors are entitled to a right of return, related to stock rotation and rebates. Distributors have the right to return a certain amount of product in exchange for new products, and /or the right for rebates, according to the agreed specification in the contracts.

**Inventory valuation.** Our inventories are stated at the lower of cost or realizable net value. Cost is determined by using the moving average cost method. At each balance sheet date, we evaluate our inventory balance for excess quantities and obsolescence. This evaluation includes an analysis of slow-moving items and sales levels by product and projections of future demand. If needed, we write off inventories that are considered obsolete or excessive. 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 revenues in the period the revision is made.

Provision for doubtful accounts. We perform ongoing credit evaluations of our trade receivables and maintain an allowance for doubtful accounts, based upon our judgment as to our ability to collect outstanding receivables. Allowance for doubtful accounts is made based upon a specific review of all the overdue outstanding invoices. In determining the provisions, we analyze our historical collection experience, current economic trends, the financial position of our customers and the payment guarantees (such as letters of credit) that we receive from our customers. We also insure certain trade receivables under credit insurance policies. If the financial condition of our customers deteriorates, resulting in their inability to make payments, additional allowances might be required. Historically, our provision for doubtful accounts has been sufficient to account for our bad debts.

## Impact of recently issued Accounting Standards

In May 2014, the FASB issued Accounting Standards Update No. 2014-09, Revenue from Contracts with Customers (Topic 606). The Company adopted the new standard, effective January 1, 2018, using the modified retrospective method applied to those contracts, which were not substantially completed as of the adoption date.

In July 2018, the FASB issued ASU No. 2018-11, Leases (Topic 842): Targeted Improvements. The standard provides an additional transition method that allows entities to apply the new leases standard at adoption date and recognize a cumulative effect adjustment to the opening balance of retained earnings in the period of adoption. The Company elected this new transition method when it adopted ASU 2016-02 on January 1, 2019.

In February 2016, the FASB issued ASU No. 2016-02, Leases (Topic 842). The standard requires lessees to recognize almost all leases on the balance sheet as a right-of-use asset and a lease liability and requires leases to be classified as either an operating or a finance type lease. The standard excludes leases of intangible assets or inventory. The standard became effective for the Company beginning January 1, 2019. The Company has estimated the opening balances of the right-of-use assets and lease liabilities upon adopting the standard as of January 1, 2019 to be approximately \$7.0 million and \$7.0 million, respectively. The Company is still in the process of finalizing the calculation.

In August 2017, the FASB issued ASU 2017-12, Derivatives and Hedging (Topic 815): Targeted Improvements to Accounting for Hedging Activities, which expands the activities that qualify for hedge accounting and simplifies the rules for reporting hedging transactions. The standard is effective for the interim and annual periods beginning on or after December 15, 2018. Early adoption is permitted. The standard is not expected to have a material impact on the Company's consolidated financial statements and related disclosures.

In September 2016, the FASB issued ASU 2016-13, "Financial Instruments - Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments". ASU 2016-13 changes the impairment model for most financial assets and certain other instruments. For trade and other receivables, held-to-maturity debt securities, loans, and other instruments, entities will be required to use a new forward-looking "expected loss" model that generally will result in the earlier recognition of allowances for losses. The guidance also requires increased disclosures. For public business entities that are SEC filers, the new standard is effective for interim and annual periods beginning after December 15, 2019. For all other public business entities, the amendments in this update are effective for fiscal years beginning after December 15, 2020, including interim periods within those fiscal years. Early adoption is permitted. The Company is evaluating the impact of the new standard on its consolidated financial statements.

## Comparison of Period to Period Results of Operations

The following table presents consolidated statement of operations data for the periods indicated as a percentage of total revenues.

	Year Ended		
	December 31		
	2016	2017	2018
Revenues	100 %	100 %	100 %
Cost of revenues	66.2	67.7	66.2
Gross profit	33.8	32.3	33.8
Operating expenses:			
Research and development, net	7.4	7.7	8.2
Selling and marketing	13.5	12.5	12.5
General and administrative	6.9	5.6	5.6
Other income	(0.7 )	(0.5 )	(0.1 )
Total operating expenses	27.1	25.3	26.2



Operating income	6.7	7.0	7.6
Financial expenses, net	2.1	1.8	1.8
Taxes on income (benefit)	0.6	0.5	(0.9)
Net income	4.0	4.7	6.7

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Year ended December 31, 2018 compared to year ended December 31, 2017

**Revenues.** Revenues totaled \$343.9 million in 2018 as compared with \$332.0 million in 2017, an increase of \$11.9 million, or 3.6%. Revenues in India increased to \$131.2 million in 2018 from \$130.0 million in 2017. Revenues in the Africa region increased to \$23.7 million in 2018, from \$12.1 million in 2017. Revenues in the APAC region increased to \$47.3 million in 2018 from \$45.0 million in 2017. Revenues in Europe decreased to \$38.9 million in 2018 from \$45.4 million in 2017. Revenues in North America increased to \$41.4 million in 2018 from \$39.5 million in 2017. Revenues in Latin America increased to \$61.3 million in 2018 from \$60.0 million in 2017.

**Cost of Revenues.** Cost of revenues totaled \$227.7 million in 2018 as compared with \$224.7 million in 2017, an increase of \$3.0 million, or 1.3%, attributed mainly due to:

- higher services subcontractors and employees' costs, primarily resulting from increased volume of revenues from services;

- Offset by lower material costs primarily due to lower volume of products revenues.

**Gross Profit.** Gross profit as a percentage of revenues increased to 33.8% in 2018 from 32.3% in 2017. This increase is mainly attributed to change in geographic mix of revenues with higher margins as well as to product cost reduction.

**Research and Development Expenses, Net.** Our net research and development expenses totaled \$28.2 million in 2018 as compared with \$25.7 million in 2017, an increase of \$2.5 million, or 9.6% primarily related to increase of \$1.7 million in salary and salary related expenses, increase of \$0.2 million in travel expenses and a decrease of \$0.4 million in IIA (Israel Innovation Authority) grants.

Our research and development efforts are a key element of our strategy and are essential to our success. We intend to maintain or slightly increase our commitment to research and development, and an increase or a decrease in our total revenue would not necessarily result in a proportional increase or decrease in the levels of our research and development expenditures. As a percentage of revenues, research and development expenses increased to 8.2% in 2018 compared to 7.7% in 2017.

**Selling and Marketing Expenses.** Selling and marketing expenses totaled \$43.0 million in 2018 as compared with \$41.7 million in 2017, an increase of \$1.3 million, or 3.1%, resulting mainly from higher variable compensation expenses. As a percentage of revenues, selling and marketing expenses were 12.5% in 2018 compared to 12.5% in 2017.

**General and Administrative Expenses.** General and administrative expenses totaled \$19.4 million in 2018 as compared with \$18.6 million in 2017, an increase of \$0.8 million, or 4.2%. This increase is attributable primarily to an increase of \$0.4 million in salaries and employee related expenses and an increase of \$0.4 million in provision for legal proceedings. As a percentage of revenues, general and administrative expenses were 5.6% in 2018 compare to 5.6% in 2017.

**Other income.** Other income for 2018 and 2017 included \$0.5 million and \$1.7 million, respectively, related to the expiration of certain indirect tax exposures.

Financial expenses, Net. Financial expenses, net totaled \$6.3 million in 2018 as compared with \$5.9 million in 2017, an increase of \$0.4 million, or 7.8%. This increase is primarily attributable to an increase of \$1.6 million in financial expenses incurred from exchange rate differences, mainly related to devaluation of the local currencies in Israel and Argentina, an increase in discounting and factoring fees of \$0.4 million, partially offset by the collection of an old debt in Venezuela of \$1.0 million, and a decrease of \$0.6 million in interest expenses. As a percentage of revenues, financial expenses, net were 1.8% in 2018 compared to 1.8% in 2017.

Taxes on income. Tax benefits totaled \$3.3 million in 2018 as compared with tax expenses of \$1.7 million in 2017, a decrease of \$5.0 million, mainly attributed to an increase of \$7.0 million in deferred tax assets primarily reflecting tax benefit due to expected utilization of net operating loss in future years and a decrease of \$1.2 million in taxes from previous years mainly related to a withholding tax asset which was expensed in 2017, partially offset by an increase of \$2.7 million in exposures reserves, related to a relative change in our tax exposure and an increase of \$0.5 million in our current taxes on income, primarily due to our sales and distribution subsidiaries.

Net profit. In 2018, the Company had \$23.0 million in net profit as compared with net profit of \$15.6 million in 2017. As a percentage of revenues, net profit increased to 6.7% in 2018 compared to 4.7% in 2017. The increase in net profit was mainly attributable to the increase in our revenues that drove the increase in gross profit and the decrease in our tax expenses.

Year ended December 31, 2017 compared to year ended December 31, 2016

Revenues. Revenues totaled \$332.0 million in 2017 as compared with \$293.6 million in 2016, an increase of \$38.4 million, or 13.1%. Revenues in India increased to \$130.0 million in 2017 from \$80.2 million in 2016, mainly due to large orders received from two major customers. Revenues in the Africa region decreased to \$12.1 million in 2017, from \$19.9 million in 2016 primarily due to the decline in the economic condition in the continent, mainly attributed to the global decline in commodity and oil prices which has caused a reduced demand for telecommunications infrastructure. Revenues in the APAC region increased to \$45.0 million in 2017 from \$29.7 million in 2016, mainly as a result of expending business with existing customers and new customers. Revenues in Europe increased to \$45.4 million in 2017 from \$43.5 million in 2016. Revenues in North America decreased to \$39.5 million in 2017 from \$40.2 million in 2016. Revenues in Latin America decreased to \$60.0 million in 2017 from \$80.1 million in 2016, mainly due to a slow-down in microwave roll out activities of one of our customers.

Cost of Revenues. Cost of revenues totaled \$224.7 million in 2017 as compared with \$194.5 million in 2016, an increase of \$30.2 million, or 15.5%, attributed mainly to:

- higher direct material and services costs primarily resulting from the higher volume of revenues; and
- higher other direct and supply chain costs primarily resulting from the higher volume of revenues.

Gross Profit. Gross profit as a percentage of revenues decreased to 32.3% in 2017 from 33.8% in 2016. This decrease is mainly attributed to higher portion of revenue coming from India.

Research and Development Expenses, Net. Our net research and development expenses totaled \$25.7 million in 2017 as compared with \$21.7 million in 2016, an increase of \$4.0 million, or 18.5% primarily as a result of an increase of \$1.8 million in salary and salary related expenses, a decrease of \$1.0 million in IIA (Israel Innovation Authority) grants, an increase of \$0.8 million in material purchasing for R&D purposes, and an increase of \$0.4 million in depreciation, office expenses and other expenses.

As a percentage of revenues, research and development expenses increased to 7.7% in 2017 compared to 7.4% in 2016.

**Selling and Marketing Expenses.** Selling and marketing expenses totaled \$41.7 million in 2017 as compared with \$39.5 million 2016, an increase of \$2.2 million, or 5.3%, resulting mainly from an increase of \$2.4 million in agent commission expenses, an increase of \$0.7 million in salary and salary related expenses, an increase \$0.6 million in sales commission expenses, partially offset by decrease of \$0.9 million in consultancy expenses and a decrease of \$0.6 million in office and other expenses. As a percentage of revenues, selling and marketing expenses were decreased to 12.5% in 2017 from 13.5% in 2016.

**General and Administrative Expenses.** General and administrative expenses totaled \$18.6 million in 2017 as compared with \$20.4 million in 2016, a decrease of \$1.8 million, or 8.9%. This decrease is attributable primarily to a decrease of \$3.2 million in doubtful debt expenses, partially offset by an increase in of \$1.1 million in salary and salary-related expenses and an increase of \$0.4 million in office and other expenses. As a percentage of revenues, general and administrative expenses decreased to 5.6% in 2017 from 6.9% in 2016.

**Other income.** Other income for 2016 and 2017 included \$1.9 million and \$1.7 million, respectively, related to the expiration of certain pre-acquisition indirect tax exposures primarily in connection with the Nera Acquisition.

**Financial expenses, Net.** Financial expenses, net totaled \$5.9 million in 2017 as compared with \$6.3 million in 2016, a decrease of \$0.4 million, or 6.6%. This decrease is primarily attributable to a decrease of \$1.6 million in financial expenses incurred from exchange rate differences related to significant devaluation of the local currencies in Argentina, Venezuela and Nigeria during 2016, partially offset by an increase of \$0.9 million in bank commissions and interest expenses related to letter of credit charges and an increase in discounting activities. As a percentage of revenues, financial expenses, net decreased to 1.8% in 2017 compared to 2.1% in 2016.

**Taxes on income.** Taxes on income totaled \$1.7 million in 2017 as compared with \$1.8 million in 2016, a decrease of \$0.1 million, mainly attributed to an increase in tax benefits of \$1.0 million related to changes in our tax exposures reserves, partially offset by an increase of \$0.7 million in taxes from previous years mainly related to a withholding tax asset which was expensed in 2017, and an increase of \$0.2 million in our current taxes on income, primarily due to our sales and distribution subsidiaries.

**Net profit.** In 2017 the Company had \$15.6 million in net profit as compared with net profit of \$11.4 million in 2016. As a percentage of revenues, net profit increased to 4.7% compared to 3.9% in 2016. The increase in net profit was mainly attributable to the increase in our revenues that drove the increase in gross profit and the decrease in our financial and tax expenses.

#### Impact of Currency Fluctuations

The majority of our revenues are denominated in U.S. dollars, and to a lesser extent, in INR (Indian Rupee), Euro, and in other currencies. Our cost of revenues is primarily denominated in U.S. dollars as well, while a major part of our operating expenses are in New Israeli Shekel (NIS), and to a lesser extent, in Indian INR (Indian Rupee), Euro, NOK (Norwegian Kroner), BRL (Brazilian Real) and other currencies. We anticipate that a material portion of our operating expenses will continue to be in NIS.

Fluctuation in the exchange rates between any of these currencies (other than U.S. dollars) and the U.S. dollar could significantly impact our results of operations as well as the comparability of these results in different periods. Even in cases where our revenues or our expenses in a certain currency are relatively modest, high volatility of the exchange rates with the U.S. dollar can still have a significant impact on our results of operations. For example, in recent years we have suffered a significant adverse impact on our financial results due to fluctuation in the exchange rates of the U.S. dollar compared to the NGN (Nigerian Naira), the ARS (Argentine Peso) and the VEB (Venezuelan Bolivar). We partially reduce this currency exposure by entering into hedging transactions. The effects of foreign currency re-measurements are reported in our consolidated statements of operations. For a discussion of our hedging transactions, please see Item 11. "QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK."

Transactions and balances in currencies other than U.S. dollars are re-measured into U.S. dollars according to the principles in ASC Topic 830, "Foreign Currency Matters." Gains and losses arising from re-measurement are recorded as financial income or expense, as applicable.

#### Effects of Government Regulations and Location on the Company's Business

For a discussion of the effects of Israeli governmental regulation and our location in Israel on our business, see Item 4. “Information on the Company – Business Overview – Conditions in Israel” and the “Risks Relating to Israel” as well as the Risk Factor “Our international operations expose us to the risk of fluctuation in currency exchange rates and restrictions related to cash repatriation” in Item 3, above.

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## B. Liquidity and Capital Resources

Since our initial public offering in August 2000, we have financed our operations primarily through the proceeds of that initial public offering, follow-on offerings and grants from the IIA.

In March 2013, the Company was provided with the revolving Credit Facility (as defined in 4.4 of ITEM 19) by four financial institutions. The Credit Facility was renewed and amended several times during the past years according to Company's needs and financial position.

In March 2018, the Company signed an amendment to the agreement in the frame of which, the fourth bank returned to the consortium after resolving some regulatory matters that caused it to terminate its participation in the consortium in March 2017, and the Credit Facility was redistributed between the consortium members. The amendment extended the Credit Facility by 2 years and 3 months, until June 30, 2020. Furthermore, the amendment includes an additional increase in bank guarantees credit lines of \$19.8 million, to \$85 million, a decrease of \$10 million in the Credit Facility for loans, from \$50 million to \$40 million, a decrease in allowed letter of credit discounting activities with one customer from \$94 million to \$50 million, and additional \$10 million of allowed factoring of invoices with another specific customer. The existing \$20 million receivables factoring permitted under the agreement, has remained unchanged. The amendment also includes reduced fees and interest spread as compared with the March 2017 amendment.

As of December 31, 2018, the Company had not utilized any of the \$40 million credit line available for short term loans. During 2018, the credit lines carried interest rates in the range of Libor+2.7% and Libor+3%.

The Credit Facility is secured by a floating charge over all Company assets as well as several customary fixed charges on specific assets.

Repayment under the Credit Facility could be accelerated by the financial institutions in certain events of default including in insolvency events, failure to comply with financial covenants or an event in which a current or future shareholder acquires control (as defined under the Israel Securities Law) of the Company.

The Credit Facility agreement contains financial and other covenants requiring that the Company maintains, among other things, minimum shareholders' equity value and financial assets, a certain ratio between our shareholders' equity (net of intangible assets) and the total value of our assets (net of intangible assets) on our balance sheet, a certain ratio between our net financial debt to each of our working capital and accounts receivable. As of December 31, 2018 and 2017, the Company met all of its covenants.

In the year ended December 31, 2018 our capital expenditures were \$15.3 million, primarily for the development of our new IP-20 and IP-50 product families and its production lines.

As of December 31, 2018, we had approximately \$35.6 million in cash and cash equivalents.

In 2018, our \$22.5 million in cash provided by operating activities was affected by the following principal factors:

- our net income of \$23.0 million;
- \$7.8 million of depreciation and amortization expenses;
- \$4.4 million increase in trade payables and accrued expenses; and
-

\$2.0 million stock-based compensation expenses

These factors were offset mainly by:

\$16.5 million increase in trade and other receivables, net;

\$6.6 million increase in deferred tax assets, net;

\$0.6 million decrease in deferred revenues paid in advance; and

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\$1 million increase in inventories.

In 2017, our \$17.2 million in cash provided by operating activities was affected by the following principal factors:

- our net income of \$15.6 million;
- \$9.2 million of depreciation and amortization expenses;
- \$3.4 million increase in trade payables and accrued expenses, net;
- \$2.6 million increase in deferred revenues paid in advance; and
  - \$1.2 million stock-based compensation expenses

These factors were offset by:

- \$8.6 million increase in inventories; and
- \$6.7 million increase in trade and other receivables.

In 2016, our \$25.8 million in cash provided by operating activities was affected by the following principal factors:

- our net income of \$11.4 million;
- \$15.8 million decrease in trade and other receivables, net;
- \$10.0 million of depreciation and amortization expenses; and
- \$4.7 million decrease in inventories.

These factors were offset by:

- \$11.6 million decrease in trade payables and accrued expenses, net; and
- \$6.2 million decrease in deferred revenues paid in advance.

Net cash used in investing activities was approximately \$15.3 million for the year ended December 31, 2018, as compared to net cash used in investing activities of approximately \$10.9 million for the year ended December 31, 2017, and net cash used in investing activities of approximately \$8.2 million for the year ended December 31, 2016. In the year ended December 31, 2018, our purchase of property and equipment amounted to \$10.3 million in addition to purchase of intangible assets of \$3.4 million and an investment in shares of \$1.6 million. In the year ended December 31, 2017, our purchase of property and equipment of \$8.5 million in addition to purchase of intangible assets of \$1.4 million and our investment in long term bank deposits of \$1.0 million. In the year ended December 31, 2016 our purchase of property and equipment amounted to \$8.2 million and our investment in short term bank deposits of \$0.2 million, were partially offset by proceeds from maturities of deposits of \$0.2 million.

Net cash provided by financing activities was approximately \$2.6 million for the year ended December 31, 2018, as compared to approximately \$16.7 million net cash used in financing activities for the year ended December 31, 2017 and net cash used in financing activities of \$17.8 million for the year ended December 31, 2016. In the year ended December 31, 2018, our net cash provided by financing activities was primarily due to proceeds from share options

exercise of \$2.6 million. In the year ended December 31, 2017, our net cash used in financing activities was primarily due to our repayment of a bank loan of \$17.0 million. In the year ended December 31, 2016, our net cash used in financing activities was primarily due to our repayment of a bank loan of \$17.9 million.

For more details concerning the Company's commitments, please see below ITEM 5. "OPERATING AND FINANCIAL REVIEW AND PROSPECTS - F. Tabular Disclosure of Contractual Obligations."

Our capital requirements are dependent on many factors, including working capital requirements to finance the business activity of the Company, and the allocation of resources to research and development, marketing and sales activities. We plan on continuing to raise capital as we may require, subject to changes in our business activities.

We believe that current cash and cash equivalent balances together with the Credit Facility available with the four financial institutions, will be sufficient for our requirements through at least the next 12 months.

### C. Research and Development

We place considerable emphasis on research and development to improve and expand the capabilities of our existing products, to develop new products (with particular emphasis on equipment for emerging IP-based networks) and to lower the cost of producing both existing and future products. We intend to continue to devote a significant portion of our personnel and financial resources to research and development. As part of our product development process, we maintain close relationships with our customers to identify market needs and to define appropriate product specifications. In addition, we intend to continue to comply with industry standards and, in order to participate in the formulation of European standards, we are full members of the European Telecommunications Standards Institute.

Our research and development activities are conducted mainly at our facilities in Tel Aviv, Israel, and also at our subsidiaries in Greece and Romania. As of December 31, 2018, our research, development and engineering staff consisted of 210 employees. Our research and development team includes highly specialized engineers and technicians with expertise in the fields of millimeter-wave design, modem and signal processing, data communications, system management and networking solutions.

Our research and development department provides us with the ability to design and develop most of the aspects of our proprietary solutions, from the chip-level, including both ASICs and RFICs, to full system integration. Our research and development projects currently in process include extensions to our leading IP-based networking product lines and development of new technologies to support future product concepts. In addition, our engineers continually work to redesign our products with the goal of improving their manufacturability and testability while reducing costs.

### Intellectual Property

For a description of our intellectual property see Item 4. "INFORMATION ON THE COMPANY – B. Business Overview - Intellectual Property."

### D. Trend Information

For a description of the trend information relevant to us see discussions in Parts A and B of Item 5. "OPERATING AND FINANCIAL REVIEW AND PROSPECTS."

### E. Off Balance Sheet Arrangements

We are not party to any material off-balance sheet arrangements. In addition, we have no unconsolidated special purpose financing or partnership entities that are likely to create material contingent liabilities.

## F. Tabular Disclosure of Contractual Obligations

	Payments due by period (in thousands of dollars)				
	Total	Less than 1 year	1-3 years	3-5 years	More than 5 years
Contractual Obligations					
Operating lease obligations <sup>1</sup>	7,316	5,104	2,092	120	-
Purchase obligations <sup>2</sup>	23,922	23,922	-	-	-
Other long-term commitment <sup>3</sup>	4,615	180	369	-	4,066
Uncertain income tax positions <sup>4</sup>	2,373	-	-	-	2,373
<b>Total</b>	<b>38,226</b>	<b>29,206</b>	<b>2,461</b>	<b>120</b>	<b>6,439</b>

(1) Consists of operating leases for our facilities and for vehicles.

(2) Consists of all outstanding purchase orders for our products from our suppliers.

(3) Our obligation for accrued severance pay under Israel's Severance Pay Law as of December 31, 2018 was approximately \$7.4 million, of which approximately \$5.1 million was funded through deposits in severance pay funds, leaving a net commitment of approximately \$2.3 million. In addition, the commitment includes a net amount of approximately \$2.3 million in pension accruals in other subsidiaries, mainly in Norway.

(4) Uncertain income tax position under ASC 740-10, "Income Taxes," are due upon settlement and we are unable to reasonably estimate the ultimate amount or timing of settlement. See Note 13g of our Consolidated Financial Statements for further information regarding the Company's liability under ASC 740-10.

## Effect of Recent Accounting Pronouncements

See Note 2, Significant Accounting Policies, in Notes to the Consolidated Financial Statements in Item 8 of Part II of this Report, for a full description of recent accounting pronouncements, including the expected dates of adoption and estimated effects on financial condition and results of operations, which is incorporated herein by reference.

## ITEM 6. DIRECTORS, SENIOR MANAGEMENT AND EMPLOYEES

## A. Directors and Senior Management

The following table lists the name, age and position of each of our current directors and executive officers:

Name	Age	Position
Zohar Zisapel	70	Chairman of the Board of Directors President and Chief
Ira Palti	61	Executive Officer, Director
Doron Arazi	55	Deputy Chief Executive Officer &

		Chief Financial Officer Executive Vice
Nurit Kruk-Zilca	45	President, Human Resources Chief
Yuval Reina	52	Operating Officer Executive Vice
Oz Zimmerman	55	President, Global Corporate Development Executive
Shai Yaniv	48	Vice President Marketing Regional
Flavio Perrucchetti	51	President, Europe Regional
Ram Prakash Tripathi	52	President, India Regional
Amit Ancikovsky	48	President, Latin America & Africa Regional
Charles Meyo	55	President, North America
Shlomo Liran <sup>(2)</sup>	68	Director
Yael Langer	54	Director
Avi Berger <sup>(1)(2)</sup>	56	Director
Avi Eizenman <sup>(2)</sup>	62	Director
Meir Sperling <sup>(1)(2)</sup>	70	Director

(1) External director

(2) Independent director

Set forth below is a biographical summary of each of the above-named directors and executive officers.

Zohar Zisapel has served as the Chairman of our Board of Directors since we were incorporated in July 1996. Mr. Zisapel also serves as a director of RADCOM Ltd., a public company traded on Nasdaq. Mr. Zisapel founded or invested in many companies in the fields of Communications, Cyber Security and Automotive and serves as chairman or director of many private companies. Mr. Zisapel received a B.Sc. and a M.Sc. in electrical engineering from the Technion, Haifa Institute of Technology (“Technion”) and an M.B.A. from the Tel Aviv University.

Ira Palti has served as our President and Chief Executive Officer since August 2005 and as a Director since June 2018. From January 2003 to August 2005, Mr. Palti was Chief Executive Officer of Seabridge Ltd., a Siemens company that is a global leader in the area of broadband services and networks. Prior to joining Seabridge, he was the Chief Operating Officer of VocalTec Communications Ltd., responsible for sales, marketing, customer support and product development. Among the positions he held before joining VocalTec was founder of Rosh Intelligent Systems, a company providing software maintenance and AI diagnostic solutions and one of the first startups in Israel. Mr. Palti received a B.Sc. in mathematics and computer science (magna cum laude) from the Tel Aviv University.

Doron Arazi has served as our Executive Vice President and Chief Financial Officer since 2014. During 2016 Mr. Arazi was appointed as Deputy CEO while continuing to carry the role of Chief Financial Officer. Mr. Arazi joined Ceragon as CFO after a long, successful career with Amdocs where he managed the business relationship with a U.S. Tier 1 mobile operator and was responsible for hundreds of employees. Prior to Amdocs, Mr. Arazi looked after the financial and growth activities of other high-tech companies in the telecommunications sector, including serving as CFO of Allot Communications and VP of Finance at Verint. Mr. Arazi is a CPA and holds a B.A. degree in Economics and Accounting as well as an MBA degree focusing on Finance and Insurance, both from the Tel Aviv University.

Nurit Kruk-Zilca has served as our Executive Vice President, Human Resources since April 2014. From July 2005 until March 2014, Ms. Kruk-Zilca served in various positions in our human resources department, the last one as VP Global HR, responsible for all human resources. From 2000 until July 2005 she was a talent acquisition and sourcing specialist for Intel Israel. Ms. Kruk-Zilca received a B.A. in Leadership & Education and an M.A. in Organizational Sociology from the Tel Aviv University.

Yuval Reina has served as our Chief Operating Officer since September 2018. Before that he served as our Executive Vice President Global Products and Services since joining Ceragon in 2015. He is responsible for the conception, creation and delivery of leading-edge wireless backhaul solutions. With more than 25 years in management of large-scale, multidisciplinary projects and sizeable R&D organizations, Mr. Reina brings a wide breadth of experience along with a sharp focus on innovation and product delivery. Mr. Reina holds a B.Sc. (cum laude) in Electrical Engineering and a M.Sc. (summa cum laude) in Management from the Ben-Gurion University.

Oz Zimerman has served as our Executive Vice President Global Corporate Development since 2014. He joined the company in March 2013. Oz brings with him over 20 years of global executive business experience in sales, marketing and business development. From 2008 to 2012, Mr. Zimerman was Corporate VP Marketing and Business Development at DSP Group (DSPG), where he was responsible for leading the company’s overall marketing activities, M&A and supporting its worldwide expansion. Prior to joining DSP Group, Oz was VP Marketing at Comverse, where he led global positioning and developed partnerships. Before joining Comverse, he was VP Channels Sales, Business Development and Strategic Marketing at ECI Telecom, and prior to his work at ECI, he was Engagement Manager at Shaldor, a leading management consulting firm. Mr. Zimerman holds a B.Sc. in Industrial Engineering & Management from NYU University (summa cum laude) and a Master’s degree in Business Administration & Industrial Engineering from Columbia University.

Shai Yaniv has served as our Executive Vice President of Marketing since September 2018. From 2014 to August 2018 he served as our Vice President of Marketing and from 2009 to 2014 Mr. Yaniv served as our Vice President of Product Management. From 2000 to 2008, Mr. Yaniv served in various senior-level positions in Alvarion Ltd., successfully leading the inception of new solutions and the execution of new business initiatives in broadband wireless access markets worldwide. Mr. Yaniv brings to the Company over 25 years of experience in marketing, product strategy, product management and business development. Mr. Yaniv holds a B.Sc. in Electrical Engineering from the Technion, and an M.Sc. in Multidisciplinary Engineering from Tel-Aviv University.

Flavio Perrucchetti has served as our Regional President, Europe since 2015. Mr. Perrucchetti joined Ceragon in August 2011 from SIAE Microelettronica, where he was the Head of Sales & Marketing for Europe from 2007. Prior to that, he was engaged for more than 20 years in sales, marketing and management activities in the telecommunications market, including as the Head of Sales for Europe & Key Accounts Manager for Italy for a major telecom service provider, and as Head of International Sales & Marketing for a major microwave manufacturer where was responsible for Latin America, the Far East and Northern Europe. Mr. Perrucchetti holds a M.Sc. in Biology and also participated in graduate studies in Environmental Chemistry at the Università degli Studi di Milano.

Ram Prakash Tripathi has served as our Regional President, India since 2002. Prior to joining Ceragon, Mr. Tripathi held senior managerial positions at several companies including Stratex and Reliance, and has over 20 years of experience in the telecommunications industry. Mr. Tripathi holds a B.Sc. in Electronics & Communication Engineering from the Dr. Babasaheb Ambedkar University, in Aurangabad, Maharashtra, India.

Amit Ancikovsky has served as our Regional President, Latin America since 2013 and has also assumed the position of Regional President Africa in 2015. Prior to joining Ceragon, Mr. Ancikovsky held a number of management positions at Airspan Networks Inc., including President of Sales & Products. Before that, Mr. Ancikovsky served as the Chief Financial Officer and Head of Business Development for Gilat Networks Latin America, a world leader in VSAT technologies. Mr. Ancikovsky holds a B.A. in Accounting and Economics and an LL.B. from the Hebrew University in Jerusalem.

Charles (Chuck) Meyo has served as our Regional President, North America since 2012. Prior to joining Ceragon, Mr. Meyo served as Vice President of Global Channels and Americas Sales at Narus, Inc. and thereafter worked within the Boeing Defense, Space and Security division (following the acquisition of Narus, Inc. by the Boeing Company in 2011). Prior to that, Mr. Meyo was the Sales Vice President of the IBM Global Accounts and Alliances organization at Avaya and held a variety of successful sales and management roles at Lucent Technologies and AT&T. Mr. Meyo holds a B.A. and B.Sc. from the Ohio State University in Columbus, Ohio.

Shlomo Liran has served as our director since August 2015, after gaining experience in senior management positions, including in the telecommunication industry. In October 2016 Mr. Liran was appointed as the CEO of Spuntech Industries Ltd. From July 2014 until January 2015, Mr. Liran served as the Chief Executive Officer of Hadera Paper Ltd. From 2010 to 2013, Mr. Liran served as the Chief Executive Officer of Avgol Nonwovens Ltd. During the years 2008 and 2009 Mr. Liran served as the Chief Executive Officer of Ericsson Israel Ltd., and from 2004 to 2007 he served as Chief Executive Officer of TRE (Scandinavian cellular network) in Sweden and in Denmark. From 2000 to 2003, he served as Chief Executive Officer of YES Satellite Multi-Channel TV. Prior to that, Mr. Liran spent thirteen years in Strauss as CEO (1995-2000), General Manager of the Dairy Division (1991-1995) and VP Operations (1987-1991). Mr. Liran holds a B.Sc. in Industrial Engineering from the Technion, an M. Eng. System Analysis from University of Toronto, Canada and an AMP-ISMP advanced management program from the Harvard Business School. Mr. Liran is one of our independent directors and is considered a “financial expert” for the purposes of the Nasdaq Rules.

Yael Langer has served as our director since December 2000. Ms. Langer served as our general counsel from July 1998 until December 2000. Ms. Langer is General Counsel and Secretary of RAD Data Communications Ltd. and other companies in the RAD-BYNET group. Since July 2009, Ms. Langer serves as a director in Radware Ltd. From

December 1995 to July 1998, Ms. Langer served as Assistant General Counsel to companies in the RAD-BYNET group. From September 1993 until July 1995, Ms. Langer was a member of the legal department of Poalim Capital Markets and Investments Ltd. Ms. Langer received an LL.B. from the Hebrew University in Jerusalem.



Avi Eizenman has served as our director since June 2018. Mr. Eizenman co-founded Silicom Ltd. in 1987 and served as its President and Chief Executive Officer, as well as a director of Silicom until April 1, 2001. As from 2001, Mr. Eizenman serves as the Active Chairman of the Board of Directors of Silicom Ltd. Mr. Eizenman served as head of the ASIC department at Scitex Ltd. in 1986. From 1979 until 1985, Mr. Eizenman held various positions, including project manager, ASIC specialist and engineer, with the Electronic Research & Development Department of the Israeli Ministry of Defense. Mr. Eizenman holds a B.Sc. degree, with honors, in Electrical Engineering from the Technion, and an M.B.A. from Tel Aviv University.

Avraham (Avi) Berger has served as our external director since June 2018, after gaining experience in senior management positions, mostly in the telecommunication industry. From 2015 Mr. Berger is the owner and CEO of AB6C Ltd a private consulting company. From November 2013 until May 2015, Mr. Berger served as the Director General of the Israeli Ministry of Communications. During the years 2012 to 2013, Mr. Berger served as VP Marketing and business developing of Ness-TSG. From 2007 to 2012 Mr. Berger served as the VP Technology & CTO of Partner Communications Ltd., and during 2007 Mr. Berger served as VP Business Development of Tadiran Communications. From 1985 to 2006, he served in the Israel Defense Forces C4I and Cyber Branch, and Signal Corps, in a number of telecommunication and command control development and project management positions, retiring as a full colonel. Mr. Berger holds a B.Sc.in Electrical Engineering from Tel Aviv University, and M.Sc.in Electrical Engineering from UCLA. Mr. Berger is one of our independent directors.

Meir Sperling has served as our external director since June 2018. Mr. Sperling presently serves as the Chairman of the Board of Verint Systems Ltd. (“VSL”) and as a board member of Verint Systems Singapore Pte. (“VSS”). Between 2000 and 2012, Mr. Sperling also served as Corporate Officer and President of the Cyber Security Division of Verint and in parallel, served as Managing Director of VSL. Between 2012 and 2015, he served as a Corporate Officer and Chief Strategy Officer of Verint. Prior to that, from January 1999 to January 2000, Mr. Sperling served as Corporate Vice President of ECI Telecom Ltd. and as the General Manager of the Business Systems Division. Mr. Sperling also served as a Director in several of ECI’s Subsidiaries. Between 1987 and 1999 Mr. Sperling served in various positions at companies of the Tadiran Group, including as Corporate Vice President and General Manager of various divisions at Tadiran. Mr. Sperling also served as a Director in several of Tadiran’s subsidiaries. Mr. Sperling received a B.Sc. in Electronic Engineering from the Ben Gurion University, Israel, in 1975.

#### Arrangements Involving Directors and Senior Management

There are no arrangements or understandings of which we are aware relating to the election of our current directors or the appointment of current executive officers in our Company. In addition, there are no family relationships among any of the individuals listed in this Section A (Directors and Senior Management).

#### B. Compensation

##### a) Aggregate Executive Compensation

During 2018, the aggregate compensation paid by us or accrued on behalf of all persons listed in Section A above (Directors and Senior Management), and other directors and executive officers who served as such during the year 2018 and have terminated their service with us, consisted of approximately \$4.2 million in salary, fees, bonuses, commissions and directors’ fees and approximately \$0.4 million in amounts set aside or accrued to provide pension, retirement or similar benefits, but excluding amounts expended for automobiles made available to our officers, expenses (including business travel, professional and business association dues and expenses) reimbursed to our officers and other fringe benefits commonly reimbursed under local practices or paid by companies in Israel (all the amounts were translated to USD based on exchange rate as of December 31, 2018).

We have a performance-based bonus plan, which includes our executive officers. The plan is based on our overall performance, the particular unit performance, and individual performance. A non-material portion of the performance

objectives of our executive officers are qualitative. The measurable performance objectives can change year over year, and are a combination of financial parameters, such as revenues, booking, gross profit, regional operating profit, operating income, net income and collection. The plan of our executive officers is reviewed and approved by our Compensation Committee and Board of Directors annually (and with respect to our CEO, also by our shareholders), as are any bonus payments to our executive officers made under such plan.

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Cash Compensation; Our directors, other than Mr. Palti, are compensated in accordance with regulations promulgated under the Companies Law concerning the remuneration of external directors (the "Remuneration Regulations"). Each of them is entitled to a cash compensation in accordance with the "fixed" amounts of the annual and participation fees, as set forth in the Remuneration Regulations, based on the classification of the Company according to the amount of its capital, and to reimbursement of travel expenses for participation in a meeting, which is held outside of the director's place of residence; currently – the sum of NIS 80,207 (approximately \$21,400) as an annual fee, the sum of NIS 2,985 (approximately \$796) as an in-person participation fee, NIS 1,791 (approximately \$478) for conference call participation and NIS 1,492 (approximately \$398) for written resolutions. As the above-mentioned amounts are within the range between the fixed amounts set forth in the Remuneration Regulations and the maximum amounts set forth in the Companies Regulations (Alleviation for Public Companies whose shares are Traded on the Stock Exchange Outside of Israel), 2000 (the "Alleviation Regulations"), they are exempt from shareholder approval, in accordance with the Israeli Companies Regulations (Relief from Related Party Transactions) – 2000 (the "Relief Regulations"). These cash amounts are subject to an annual adjustment for changes in the Israeli consumer price index and to an annual adjustment in accordance with the classification of the Company according to the size of its capital. For more information, please see "Remuneration of Directors" and "The Share Option Plan" below and Note 14 to our consolidated financial statements included as Item 18 in this annual report.

Equity Compensation. In addition to the cash fees, as remuneration for their contribution and efforts as directors of the Company, and in line with the limitations set forth in our Compensation Policy with respect to equity-based compensation for non-executive directors, our directors, other than Mr. Palti, receive annual equity grants with respect to their three-year terms of service as directors, which was last approved to them by our shareholders on June 12, 2018, the date of the Company's 2018 Annual General Meeting of Shareholders (the "2018 AGM"), as follows:

(i) Zohar Zisapel, our Chairman of the Board of Directors, received 150,000 options to purchase 150,000 Ordinary Shares, 50,000 of which were granted on the date of the 2018 AGM, an additional 50,000 shall be granted upon the first anniversary of the 2018 AGM (i.e., on June 12, 2019), and the remaining 50,000 shall be granted upon the second anniversary of the 2018 AGM (i.e., on June 12, 2020), provided he is still a director of the Company at the time of each grant;

(ii) each of Yael Langer, Shlomo Liran, Avi Eizenman, Avi Berger and Meir Sperling, directors of the Company, received options to purchase 50,000 Ordinary Shares, one-third of which (16,667 options) were granted on the date of the 2018 AGM, an additional one third (16,667 options) shall be granted upon the first anniversary of the 2018 AGM (i.e., on June 12, 2019), and the remaining 16,666 options shall be granted on the second anniversary of the 2018 AGM (i.e., on June 12, 2020), provided he or she are still directors of the Company at the time of each grant.

The options granted each year vest on the date of grant and the exercise price is equal to the average closing price of the Company's Shares on the Nasdaq Global Select Market for the period equal to thirty (30) consecutive trading days immediately preceding the date of grant. These grants are made under the Company's Amended and Restated Share Option and RSU Plan and under the Capital Gains Route of Section 102(b)(2) of the Israeli Income Tax Ordinance (the "Ordinance"), except for the options granted to Zohar Zisapel, Chairman of the Board of Directors, which are granted under Section 3(9) of the Ordinance.

For clarification, the Company does not pay our President and CEO, Mr. Ira Palti, any compensation, in cash or equity, in connection with his service as a director of the Company.

During 2018, we granted to our directors and executive officers, in the aggregate, options to purchase 856,001 ordinary shares and 2,000 restricted share units ("RSUs") under our Amended and Restated Share Option and RSU Plan, with an exercise price that ranges from \$2.73 to \$3.56 per share. Options will expire 6 years after their date of grant.

b) Individual Compensation of Office Holders

The following information describes the compensation of our five most highly compensated “officer holders” (as such term is defined in the Companies Law); with respect to the year ended December 31, 2018. The five individuals for whom disclosure is provided are referred to herein as “Covered Office Holders.” All amounts specified below are in terms of cost to the Company, translated to USD based on exchange rate as of December 31, 2018, and are based on the following components:

**Salary Costs.** Salary Costs include gross salary, benefits and perquisites, including those mandated by applicable law which may include, to the extent applicable to each Covered Office Holder’s, payments, contributions and/or allocations for pension, severance, car or car allowance, medical insurance and risk insurance (e.g., life, disability, accidents), phone, convalescence pay, relocation, payments for social security, and other benefits consistent with the Company’s guidelines.

**Performance Bonus Costs.** Performance Bonus Costs represent bonuses granted to the Covered Office Holder’s with respect to the year ended December 31, 2018, paid in accordance with the Covered Office Holder’s performance of targets as set forth in his bonus plan, as well as a proportionate amount of a retention bonus that is related to the reported year, and approved by the Company’s Compensation Committee and Board of Directors.

**Equity Costs** represent the expense recorded in our financial statements for the year ended December 31, 2018, with respect to equity-based compensation granted in 2018 and in previous years. For assumptions and key variables used in the calculation of such amounts see note 2u of our audited consolidated financial statements.

**Ira Palti – CEO.** Salary Costs - \$369,572; Performance Bonus Costs - \$364,565; Equity Costs - \$373,956.

**Doron Arazi – Deputy CEO & CFO.** Salary Cost - \$309,353; Performance Bonus Cost - \$189,767; Equity Costs - \$103,316.

**Amit Ancikovsky – Regional President Latin America & Africa.** Salary Costs - \$318,957; Performance Bonus Costs - \$326,499; Equity Costs - \$58,571.

**Charles Meyo – Regional President North America.** Salary Costs - \$343,611; Performance Bonus Costs - \$278,173; Equity Costs - \$41,218.

**Flavio Perrucchetti – Regional President Europe.** Salary Costs - \$377,579; Performance Bonus Costs - \$112,664; Equity Costs - \$41,713.

C. Board Practices

Corporate Governance Practices

We are incorporated in Israel and therefore are generally subject to various corporate governance practices under the Companies Law, relating to matters such as external directors, audit committee (hereinafter referred to as “Corporate Audit Committee”), compensation committee, internal auditor and approvals of interested parties’ transactions. These matters are in addition to the ongoing listing conditions under the Nasdaq Rules and other relevant provisions of U.S. securities laws. Under applicable Nasdaq Rules, a foreign private issuer (such as the Company) may generally follow its home country rules of corporate governance in lieu of the comparable Nasdaq Rules, except for certain matters such as composition and responsibilities of the audit committee and the independence of its members. See Item 3. “KEY INFORMATION – Risk Factors – Risks Related to Operation in Israel - As a foreign private issuer we are permitted to follow certain home country corporate governance practices, instead of applicable SEC and Nasdaq Rules, which may result in less protection than is afforded to investors under rules applicable to domestic issuers.” For

information regarding home country rules followed by us see Item 16G. "CORPORATE GOVERNANCE."

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## General Board Practices

Under the Company's Articles of Association, the Board of Directors is to consist of not less than five (5) and not more than nine (9) directors, unless otherwise determined by a resolution of the Company's shareholders. Our Board of Directors presently consists of seven (7) members, after the termination of service of Mr. Orgler, one of our external directors, on March 24, 2019. The Board of Directors retains all the powers in managing our Company that are not specifically granted to the shareholders. For example, for whatever purposes it deems fit, the Board may decide to borrow money or may set aside reserves out of our profits.

The Board of Directors may pass a resolution when a quorum is present, and by a vote of at least a majority of the directors present when the resolution is put to vote. A quorum is defined as at least a majority of the directors then in office who are lawfully entitled to participate in the meeting but not less than two directors. The Chairman of the Board is elected and removed by the board members. Minutes of the Board meetings are recorded and kept at our offices.

The Board of Directors may, subject to the provisions of the Companies Law, appoint a committee of the Board and delegate to such committee all or any of the powers of the Board, as it deems appropriate. Notwithstanding the foregoing and subject to the provisions of the Companies Law, the Board may, at any time, amend, restate or cancel the delegation of any of its powers to any of its committees. Our Board of Directors has appointed a Corporate Audit Committee under the Companies Law, a Financial Audit Committee under Nasdaq Rules, a Compensation Committee and a Nomination Committee.

Our Articles of Association provide that any director may appoint as an alternate director, by written notice to us, any individual who is qualified to serve as director and who is not then serving as a director or alternate director for any other director. An alternate director has all of the rights and obligations of a director, excluding the right to appoint an alternate for himself. Currently no alternate directors serve on our Board.

## Terms and Skills of Directors

Our directors, other than external directors, are elected at the annual general meeting of shareholders for a term ending on the date of the third annual general meeting following the general meeting at which they were elected, unless earlier terminated in the event of such director's death, resignation, bankruptcy, incapacity or removal. Accordingly, our five serving directors (which are not external directors), serve until the date of the 2021 annual general meeting of shareholders. Information regarding the period during which each of our directors has served in that office can be found above under the heading "Directors and Senior Management."

According to the Companies Law, a person who does not possess the skills required and the ability to devote the appropriate time to the performance of the office of director in a company, taking into consideration, among other things, the special requirements and size of that company, shall neither be appointed as a director nor serve as a director in a public company. A public company shall not summon a general meeting the agenda of which includes the appointment of a director, and a director shall not be appointed, unless the candidate has submitted a declaration that he or she possesses the skills required and the ability to devote the appropriate time to the performance of the office of director in the company, that sets forth the aforementioned skills and further states that the limitations set forth in the Companies Law regarding the appointment of a director do not apply in respect of such candidate.

A director who ceases to possess any qualification required under the Companies Law for holding the office of director or who becomes subject to any ground for termination of his/her office must inform the company immediately and his/her office shall terminate upon such notice.

## Independent Directors

Under the Nasdaq Rules, the majority of our directors are required to be independent. The independence standard under the Nasdaq Rules excludes, among others, any person who is: (i) a current or former (at any time during the past three years) employee of the company or its affiliates; or (ii) an immediate family member of an executive officer (at any time during the past three years) of the company or its affiliates. Due to the death of our former external director, Mr. Avi Patir, in January 2018, we temporarily did not comply with this particular requirement of the Nasdaq Rules. However, consistent with Listing Rules 6505(b)(1)(A), Nasdaq Rules provided the Company with a cure period in order to regain compliance, which the Company did immediately following its 2018 AGM, when five of its then serving directors qualified as independent directors. Currently, four of our currently serving directors - Messrs. Shlomo Liran, Avi Berger, Meir Sperling and Avi Eizenman – qualify as independent directors.

## External Directors

Under the Companies Law, Israeli public companies are generally required to appoint at least two external directors. Each committee of a company's board of directors, which is authorized to exercise the board of directors' authorities, is required to include at least one external director, and the corporate audit and compensation committees must include all of the external directors. Regulations promulgated under the Companies Law allow us, as a company whose shares are traded on Nasdaq, and does not have a controlling shareholder (within the meaning of the Companies Law) to exempt ourselves from the requirement to have external directors on our Board of Directors and from related obligations imposed by the Companies Law concerning such external directors, provided that we continue to comply with applicable U.S. securities laws and Nasdaq listing rules. Implementation of such exemption is not currently planned.

**Qualification.** To qualify as an external director, an individual or his or her relative, partner, employer, any person to whom such person is directly or indirectly subject to, or any entity under his or her control may not have, as of the date of appointment, or may not have had, during the previous two years, any affiliation with the company, any entity controlling the company on the date of the appointment or with any entity controlled, at the date of the appointment or during the previous two years, by the company or by its controlling shareholder and in a company that does not have a shareholder or an affiliated group of shareholders holding 25% or more of the company's voting rights, such person may not have any affiliation with any person who, at the time of appointment or thereafter, is the chairman, the CEO, chief financial officer or a 5% shareholder of the company. In general, the term "affiliation" includes:

- an employment relationship;
- a business or professional relationship maintained on a regular basis;
- "Control"; and

service as an "Office Holder"; the term "Office Holder" as defined in the Companies Law includes a director, the CEO, an executive vice president, a vice president, any other person fulfilling or assuming any of the foregoing positions without regard to such person's title, and any manager who is directly subordinated to the CEO.

"Control" is defined in the Israeli Securities Law as the ability to direct the actions of a company, excluding power that is solely derived from a position as a director of the company or any other position with the company; a person who holds 50% or more of the "controlling power" in the company (i.e., voting rights or the right to appoint a director or a general manager) is automatically considered to possess control.

In addition, no person can serve as an external director if the person's position or other activities creates, or may create, a conflict of interest with the person's responsibilities as an external director or may otherwise interfere with the person's ability to serve as an external director. Until the lapse of two years from termination of office, a company or its controlling shareholder may not give any direct or indirect benefit to the former external director.

**Election and Term of External Directors.** External directors are elected by a majority vote at a shareholders' meeting, provided that either:

the majority of the shares voted at the meeting, which are not held by controlling shareholders or shareholders with personal interest in approving the appointment (excluding personal interest not resulting from contacts with the controlling shareholder) ("Non-Related Votes"), not taking into account any abstentions, vote in favor of the election; or

the total number of Non-Related Votes, voting against the election of the external director, does not exceed two percent of the aggregate voting rights in the company.



In a company in which, at the date of appointment of an external director, all the directors are of the same gender, the external director to be appointed shall be of the other gender.

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An external director can be removed from office only by: (i) a special meeting of the shareholders, by the same majority of shareholders that is required to elect an external director; or (ii) a court, and provided that either: (a) the external director ceases to meet the statutory qualifications with respect to his or her appointment; or (b) the external director violates his or her duty of loyalty to the company. The court may also remove an external director from office if he or she is unable to perform his or her duties on a regular basis.

An external director who ceases to possess any qualification required under the Companies Law for holding the office of an external director must inform the company immediately and his/her office shall terminate upon such notice.

An external director serves a three-year term and may be re-elected to serve in this capacity for two additional terms of three years each. Thereafter, he or she may be re-elected by the shareholders for additional periods of up to three years each, only if the Corporate Audit Committee, followed by the Board, have approved the reelection, taking into consideration the expertise and special contribution of the external director to the work of the board and its committees, and determining that the appointment for a further term of service is beneficial to the company.

Re-election of an external director may be effected through one of the following mechanisms:

1. a shareholder holding one percent or more of a company's voting rights proposed the re-election of the nominee;
2. the board of directors proposed the re-election of the nominee and the election was approved by the shareholders by the majority required to appoint external directors for their initial term; or
3. the external director who is up for renewal has proposed himself or herself for re-election.

With respect to mechanisms 1 and 3 above: (i) the re-election must be approved by a majority of the votes cast by the shareholders of the Company, excluding the votes of (a) controlling shareholders; and (b) shareholders who have a personal interest in approving such nomination resulting from their relations with the controlling shareholders; (ii) the re-election must include votes cast in favor of the re-election by such non-excluded shareholders constituting more than two percent of the voting rights in the Company; and (iii) the external director cannot be a related or competing shareholder or a relative of such a related or competing shareholder at the time of the appointment, and cannot have any affiliation with a related or competing shareholder, at the time of the appointment or within the two years preceding the appointment. A "related or competing shareholder" exists where: (a) a shareholder proposing the re-appointment or a shareholder holding 5% or more of the outstanding shares or voting rights of the company; and (b) at the time of the re-appointment, such shareholder, a controlling shareholder thereof or a company controlled by such shareholder or by a controlling shareholder thereof, either has business relationships with the Company or is a competitor of the Company.

Financial and Accounting Expertise. Pursuant to the Companies Law and regulations promulgated thereunder, (1) each external director must have either "accounting and financial expertise" or "professional qualifications and (2) at least one of the external directors must have "accounting and financial expertise." A director with "accounting and financial expertise" is a director whose education, experience and skills qualifies him or her to be highly proficient in understanding business and accounting matters and to thoroughly understand the Company's financial statements and to stimulate discussion regarding the manner in which financial data is presented. A director with "professional qualifications" is a person that meets any of the following criteria: (i) has an academic degree in economics, business management, accounting, law, public administration; (ii) has a different academic degree or has completed higher education in an area relevant to the Company's business or which is relevant to his or her position; or (iii) has at least five years' experience in any of the following, or has a total of five years' experience in at least two of the following: (A) a senior position in the business management of a corporation with substantial business activities; (B) a senior public position or a senior position in the public service; or (C) a senior position in the Company's main fields of business.

Compensation. An external director is entitled to compensation as provided in the Remuneration Regulations and is otherwise prohibited from receiving any other compensation, directly or indirectly, from the Company. For more

information, please see “Remuneration of Directors” below.

Our External Directors. Following a recommendation made by our Nomination Committee and Board of Directors, our shareholders approved, at the 2018 AGM, the appointment of each of Messrs. Avi Berger and Meir Sperling for service as our external directors, for a term of three years each, beginning on June 12, 2018 (the date of the 2018 AGM). Further, our Board of Directors has determined that Mr. Sperling has the requisite accounting and financial expertise and that Mr. Berger has the requisite professional qualifications to serve as external directors.

## Remuneration of Directors

Directors' remuneration is generally consistent with our compensation policy for office holders (see below) and generally requires the approval of the Compensation Committee, the Board of Directors and the shareholders (in that order).

Notwithstanding the above, under special circumstances, the Compensation Committee and the Board of Directors may approve an arrangement that deviates from our compensation policy, provided that such arrangement is approved by a special majority of the company's shareholders, including (i) at least a majority of the shareholders, present and voting (abstentions are disregarded), who are not controlling shareholders and who do not have a personal interest in the matter, or (ii) the non-controlling shareholders and shareholders who do not have a personal interest in the matter who were present and voted against the matter hold two percent or less of the voting power of the Company.

According to the Remuneration Regulations, external directors are generally entitled to an annual fee, a participation fee for board or committee meetings and reimbursement of travel expenses for participation in a meeting which is held outside of the external director's place of residence. The minimum, fixed and maximum amounts of the annual and participation fees are set forth in the Remuneration Regulations, and are based on the classification of the Company according to the size of its capital. Remuneration of an external director in an amount which is less than the fixed annual fee or the fixed participation fee requires the approval of the Compensation Committee, the Board of Directors and the shareholders (in that order). A candidate for service as external director must be informed about the terms of remuneration prior to his/her appointment and, subject to certain exceptions, these terms cannot be amended throughout the three-year period during which he or she is in office. A company may compensate an external director in shares or rights to purchase shares, other than convertible debentures which may be converted into shares, in addition to the annual and the participation fees, and the reimbursement of expenses, subject to certain limitations set forth in the Remuneration Regulations.

Additionally, according to the Relief Regulations, shareholders' approval for directors' compensation and employment arrangements is not required if both the compensation committee and the board of directors resolve that either (i) the directors' compensation and employment arrangements are solely for the benefit of the Company or (ii) the remuneration to be paid to any such director does not exceed the maximum amounts set forth in the regulations applicable to companies whose shares are traded outside of Israel. Further, according to the Relief Regulations, shareholders' approval for directors' compensation and employment arrangements is not required if (i) both the compensation committee and the board of directors resolve that such terms are not more beneficial than the former terms, or are essentially the same in their effect, and are in line with the company's compensation policy; and (ii) such terms are brought for shareholder approval at the next general meeting of shareholders.

Neither we nor any of our subsidiaries have entered into a service contract with any of our current directors that provides for benefits upon termination of their service as directors.

For a full discussion of the remuneration paid to our directors, including our external directors, see above in "B. Compensation a) Aggregate Executive Compensation."

## Committees of the Board of Directors

### Financial Audit Committee

In accordance with the rules of the SEC under the Exchange Act and under Nasdaq Rules, we are required to have an audit committee consisting of at least three directors, each of whom (i) is independent; (ii) does not receive any compensation from the Company (other than directors' fees); (iii) is not an affiliated person of the Company or any of its subsidiaries; (iv) has not participated in the preparation of the Company's (or subsidiary's) financial statements during the past three years; and (v) is financially literate and one of whom has been determined by the board to be a

financial expert. Due to the death of our former external director, Mr. Avi Patir, in January, 2018, we temporarily did not comply with this particular requirement of the Nasdaq Rules. However, consistent with Listing Rules 6505(b)(1)(A), Nasdaq provided the Company with a cure period in order to regain compliance, which the Company did immediately following its 2018 AGM. As of the date of the 2018 AGM, Messrs., Shlomo Liran, Avi Berger, Meir Sperling and Yair Orgler served on our Financial Audit Committee, each of whom has been determined by the Board to meet the Nasdaq Rules and SEC standards described above. As Mr. Orgler terminated his service as our director on March 24, 2019, currently, Messrs. Liran, Berger and Sperling serve as the members of our Financial Audit Committee, with Mr. Liran serving as chairman of such committee and as its financial expert (see Item 16A. "AUDIT COMMITTEE FINANCIAL EXPERT" below).

We have adopted an Audit Committee charter as required under the Nasdaq Rules. The duties and responsibilities of the Financial Audit Committee include: (i) recommending the appointment of the Company's independent auditor to the Board of Directors, determining its compensation and overseeing the work performed by it; (ii) pre-approving all services of the independent auditor; (iii) overseeing our accounting and financial reporting processes and the audits of our financial statements; and (iv) handling complaints relating to accounting, internal controls and auditing matters.

#### Corporate Audit Committee

Under the Companies Law, the board of directors of any Israeli public company must appoint an audit committee comprised of at least three directors and all the external directors. In addition, the majority of the members must meet certain independence criteria and may not include: (i) the chairman of the board; (ii) any controlling shareholder or any relative thereof; (iii) any director employed by or providing services on a regular basis to, the Company, a controlling shareholder or a company owned by a controlling shareholder; or (iv) any director whose main income is provided by a controlling shareholder ("Non-Permitted Members"). The chairman of such audit committee must be an external director. As of the date of the 2018 AGM, Messrs. Shlomo Liran, Avi Berger, Meir Sperling and Yair Orgler served on our Corporate Audit Committee, with Mr. Orgler serving as its chairman. As Mr. Orgler terminated his service as our director on March 24, 2019, currently, Messrs. Liran, Berger and Sperling serve on our Corporate Audit Committee, each of whom meets the independence criteria defined in the Companies Law, and Mr. Berger serves as its chairman.

The duties and responsibilities of our Corporate Audit Committee include: (i) identifying of irregularities and deficiencies in the management of our business, in consultation with the internal auditor and our independent auditor, and suggesting appropriate courses of action to amend such irregularities; (ii) reviewing and approving certain transactions and actions of the Company, including the approval of related party transactions that require approval by the audit committee under the Companies Law; defining whether certain acts and transactions that involve conflicts of interest are material or not and whether transactions that involve interested parties are extraordinary or not, and to approve such transactions; (iii) recommending the appointment of the internal auditor and its compensation to the Board of Directors; (iv) examining the performance of our internal auditor and whether it is provided with the required resources and tools necessary for him to fulfill its role, considering, inter alia, the Company's size and special needs; (v) setting procedures for handling complaints made by the Company's employees in connection with management deficiencies and the protection to be provided to such employees; and (vi) performing such other duties that are or will be designated solely to the audit committee in accordance with the Companies Law and the Company's Articles of Association.

Non-Permitted Members shall not attend Corporate Audit Committee meetings or take part in its decisions, unless the chairman of the Corporate Audit Committee has determined that such person is required for the presentation of a certain matter. Nevertheless, an employee who is not a controlling shareholder or a relative thereof, may be present at discussion of the committee, pursuant to the committee's request, and the company's legal counsel and secretary, who are not controlling shareholders or relatives thereof, may be present during both the discussion and resolution of the committee, pursuant to the committee's request.

The quorum for discussions and decisions shall be the majority of the members of the Corporate Audit Committee, provided that the majority of the members present meet the independence criteria set forth in the Companies Law, and at least one of them is an external director.

#### Compensation Committee

General. According to the Companies Law, the board of directors of any Israeli public company must appoint a compensation committee, comprised of at least three directors, including all of the external directors. The majority of the compensation committee must be comprised of external directors and an external director must serve as the chairman of the committee. The remaining members of the committee must satisfy the criteria for remuneration

applicable to the external directors and qualified to serve as members of the audit committee pursuant to Companies Law requirements (Corporate Audit Committee), as described above (the “Compensation Committee Qualifications”). Messrs. Liran, Berger and Sperling serve on our Compensation Committee, each of whom meets the Compensation Committee Qualifications, and Mr. Sperling serves as its chairman.

The Compensation Committee is responsible for: (i) making recommendations to the Board of Directors with respect to the approval of the compensation policy (see below) and any extensions thereto; (ii) periodically reviewing the implementation of the compensation policy and providing the Board of Directors with recommendations with respect to any amendments or updates thereto; (iii) reviewing and resolving whether or not to approve arrangements with respect to the terms of office and employment of office holders; and (iv) determining whether or not to exempt under certain circumstances a transaction with a candidate for CEO, who is not affiliated with the Company or its controlling shareholders, from shareholder approval, and provided that the terms approved are consistent with the compensation policy.

In addition, our Compensation Committee administers our Amended and Restated Share Option and RSU Plan. The Board has delegated to the Compensation Committee the authority to grant options and RSUs under this plan and to act as the share incentive committee pursuant to this plan, provided that such grants are within the framework determined by the Board, and that the grant of equity compensation to our office holders is also approved by our board.

The attendance and participation in the meetings of the Compensation Committee is subject to the same limitations that apply to the Corporate Audit Committee.

The quorum for discussions and decisions is the majority of the Compensation Committee members, provided that the majority of the members present are independent directors and at least one of them is an external director.

Under Nasdaq Rules, the compensation payable to our executive officers must be determined or recommended to the board for determination either by a majority of the independent directors on the board, in a vote in which only independent directors participate, or by a compensation committee comprised solely of independent directors, subject to certain exceptions. We generally follow the provisions of the Companies Law with respect to matters in connection with the composition and responsibilities of our Compensation Committee, office holder compensation, and any required approval by the shareholders of such compensation. (see also under Item 16G. "CORPORATE GOVERNANCE").

Under the Companies Law and regulations promulgated there under: (a) an Israeli public company whose shares are traded on Nasdaq, and does not have a controlling shareholder (within the meaning of the Companies Law), is permitted to exempt itself from the above-mentioned composition requirements set forth under the Companies Law with respect to audit committee and compensation committee set forth under the Companies Law, and to follow only the composition requirements under the Nasdaq Listing Rules; and (b) an Israeli public company may elect to have its audit committee carry out all the duties and responsibilities conferred by the Companies Law upon the compensation committee, provided that such audit committee meets the Compensation Committee Qualifications. Following the death of our former external director, Mr. Avi Patir, in January 2018, we temporarily did not comply with the Compensation Committee Qualifications, and accordingly, in February 2018 our Board of Directors has elected to take a temporary exemption from the Companies Law composition requirements with respect to compensation committee, and to follow the composition requirements set forth under the Nasdaq Listing Rules, until such time when the Company regains compliance with the Compensation Committee Qualifications. We regained compliance with the Compensation Committee Qualifications as of the 2018 AGM.

#### Nomination Committee

The Nasdaq Rules require that director nominees be selected or recommended for the board's selection either by a nomination committee composed solely of independent directors, or by a majority of independent directors, in a vote in which only independent directors participate, subject to certain exceptions. Currently, Messrs. Shlomo Liran and Avi Eizenman, two of our independent directors, are the members of our Nomination Committee, which recommends director nominees for our Board's approval.





### Approval of Office Holders Terms of Employment

The terms of office and employment of office holders (other than directors and the CEO) require the approval of the compensation committee and then of the board of directors, provided such terms are in accordance with the company's compensation policy. If terms of employment of such office holder are not in accordance with the compensation policy, then shareholder approval is also required. However, in special circumstances the compensation committee and then the board of directors may nonetheless approve such terms of office and employment, even if they were not approved by the shareholders, following a further discussion and for detailed reasoning.

The terms of office and employment of a CEO, regardless of whether such terms conform to the company's compensation policy, must be approved by the compensation committee, the board of directors and then by a special majority of the shareholders, including: (i) a majority of the shareholders, , who are not controlling shareholders and who do not have a personal interest in the matter, present and voting (abstentions are disregarded); or (ii) the non-controlling shareholders and shareholders who do not have a personal interest in the matter, who were present and voted against the matter hold two percent or less of the voting power of the Company.

Notwithstanding the above, in special circumstances the compensation committee and then the board of directors may nonetheless approve compensation for the CEO, even if such compensation was not approved by the shareholders, following a further discussion and for detailed reasoning. In addition, under certain circumstances, a company may be exempt from receiving shareholder approval with respect to the terms of office and employment of a candidate for the position of CEO.

Amendment of existing terms of office and employment of office holders who are not directors, including chief executive officers, require the approval of the compensation committee only, if the compensation committee determines that the amendment is not material.

The terms of office and employment of directors, regardless of whether such terms conform to the company's compensation policy, must be approved by the compensation committee, the board of directors and then by the shareholders, and, in case that such terms are inconsistent with the company's compensation policy, such shareholders' approval must be obtained by the special majority detailed above with respect to the CEO.

However, and as referred to above with respect to remuneration of directors, according to the Relief Regulations, a company's compensation committee and board of directors are permitted to approve terms of office and employment of a CEO or of a director, without convening a general meeting of shareholders, provided however, that such terms: (i) are not more beneficial than the former terms, or are essentially the same in their effect; (ii) are in line with the company's compensation policy; and (iii) are brought for shareholder approval at the next general meeting of shareholders.

### Compensation Policy

As required by the Companies Law, our shareholders, following the approval of our Board of Directors and the recommendation of our Compensation Committee, approved and adopted a compensation policy in 2012. The compensation policy was revised in 2015 and again in the 2018 AGM (the "Compensation Policy"). The Compensation Policy sets forth the Company's policy regarding the terms of office and employment of office holders, including compensation, equity awards, severance and other benefits, exemption from liability and indemnification, a policy which takes into account, among other things, providing proper incentives to directors and officers, management of risk by the Company, the office holders' contribution to achieving corporate objectives and increasing profits, and the function of the officer or director. The Compensation Policy provides our Compensation Committee and our Board of Directors with adequate measures and flexibility to tailor each of our office holder's compensation package based, among other matters, on geography, tasks, role, seniority and capability. Moreover, it is intended to motivate our

office holders to achieve ongoing targeted results in addition to a high level of business performance in the long term, all without encouraging excessive risk taking.

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### Approval of Certain Transactions with Related Parties

The Companies Law requires the approval of the corporate audit committee or the compensation committee, thereafter, the approval of the board of directors and in certain cases the approval of the shareholders, in order to effect specified actions and extraordinary transactions such as the following:

- transactions with office holders and third parties, where an office holder has a personal interest in the transaction;
- employment terms of office holders; and

extraordinary transactions with controlling parties, and extraordinary transactions with a third party where a controlling party has a personal interest in the transaction, or any transaction with the controlling shareholder or his relative regarding terms of service provided directly or indirectly (including through a company controlled by the controlling shareholder) and terms of employment (for a controlling shareholder who is not an office holder). A “relative” is defined in the Companies Law as spouse, sibling, parent, grandparent, descendant, spouse’s descendant, sibling or parent and the spouse of any of the foregoing.

Further, such extraordinary transactions with controlling shareholders require the approval of the corporate audit committee or the compensation committee, the board of directors and the majority of the voting power of the shareholders present and voting at the general meeting of the company (not including abstentions), provided that either:

· the majority of the shares of shareholders who have no personal interest in the transaction and who are present and voting, not taking into account any abstentions, vote in favor; or

· shareholders who have no personal interest in the transaction who vote against the transaction do not represent more than two percent of the aggregate voting rights in the company.

Any shareholder participating in the vote on approval of an extraordinary transaction with a controlling shareholder must inform the company prior to the voting whether or not he or she has a personal interest in the approval of the transaction, and if he or she fails to do so, his or her vote will be disregarded.

Further, such extraordinary transactions as well as any transactions with a controlling shareholder or his relative concerning terms of service or employment need to be re-approved once every three years, provided however that with respect to certain such extraordinary transactions the corporate audit committee may determine that a longer duration is reasonable given the circumstances related thereto and such extended period has been approved by the shareholders.

In accordance with regulations promulgated under the Companies Law, certain defined types of extraordinary transactions between a public company and its controlling shareholder(s) are exempt from the shareholder approval requirements.

The approval of the corporate audit committee, followed by the approval of the board of directors and the shareholders, is required to effect a private placement of securities, in which either: (i) 20% or more of the company’s outstanding share capital prior to the placement is offered, and the payment for which (in whole or in part) is not in cash, in tradable securities registered in a stock exchange or not under market terms, and which will result in: (a) an increase of the holdings of a shareholder that holds 5% or more of the company’s outstanding share capital or voting rights; or (b) will cause any person to become, as a result of the issuance, a holder of more than 5% of the company’s outstanding share capital or voting rights; or (ii) a person will become a controlling shareholder of the company.

A “controlling party” is defined in the Israeli Securities Law and in the Companies Law, for purposes of the provisions governing related party transactions, as a person with the ability to direct the actions of a company but excluding a person whose power derives solely from his or her position as a director of the company or any other position with the company, and with respect to approval of transactions with related parties also a person who holds 25% or more of the voting power in a public company if no other shareholder owns more than 50% of the voting power in the company, and provided that two or more persons holding voting rights in the company, who each have a personal interest in the approval of the same transaction, shall be deemed to be one holder for the purpose of evaluating their holdings with respect to approvals of transactions with related parties.

Compensation committee approval is also required (and thereafter, the approval of the board of directors and in certain cases – the approval of the shareholders) to approve the grant of an exemption from the responsibility for a breach of the duty of care towards the company, for the provision of insurance and for an undertaking to indemnify any office holder of the company; see below under “Exemption, Insurance and Indemnification of Directors and Officers.”

## Duties of Office Holders and Shareholders

### Duties of Office Holders

**Fiduciary Duties.** The Companies Law imposes a duty of care and a duty of loyalty on all office holders of a company, including directors. The duty of care requires an office holder to act with the level of care with which a reasonable office holder in the same position would have acted under the same circumstances. The duty of loyalty includes avoiding any conflict of interest between the office holder's position in the company and his personal affairs, avoiding any competition with the company, avoiding the exploitation of any business opportunity of the company in order to receive personal advantage for himself or others, and revealing to the company any information or documents relating to the company's affairs which the office holder has received due to his position as an office holder.

The company may approve an action by an office holder from which the office holder would otherwise have to refrain due to its violation of the office holder's duty of loyalty if: (i) the office holder acts in good faith and the act or its approval is not to the detriment of the company, and (ii) the office holder discloses the nature of his or her interest in the transaction to the company a reasonable time prior to the company's approval.

Each person listed in the table above under "Directors and Senior Management" is considered an office holder under the Companies Law.

**Disclosure of Personal Interests of an Office Holder.** The Companies Law requires that an office holder of a company promptly disclose any personal interest that he or she may have, and all related material information and documents known to him or her relating to any existing or proposed transaction by the company. If the transaction is an extraordinary transaction, the office holder must also disclose any personal interest held by the office holder's spouse, siblings, parents, grandparents, descendants, spouse's siblings, parents and descendants and the spouses of any of these people, or any corporation in which the office holder: (i) holds at least 5% of the company's outstanding share capital or voting rights; (ii) is a director or chief executive officer; or (iii) has the right to appoint at least one director or the chief executive officer. An extraordinary transaction is defined as a transaction that is either: (i) not in the ordinary course of business; (ii) not on market terms; or (iii) likely to have a material impact on the company's profitability, assets or liabilities.

In the case of a transaction which is not an extraordinary transaction, after the office holder complies with the above disclosure requirements, only board approval is required unless the articles of association of the company provide otherwise. The transaction must not be adverse to of the company's interest. If a transaction is an extraordinary transaction, or concerns the terms of office and employment, then, in addition to any approval stipulated by the articles of association, it must also be approved by the company's audit committee (or with respect to terms of office and employment, by the compensation committee) and then by the board of directors, and, under certain circumstances, by shareholders of the company.

A person with a personal interest in any matter may not generally be present at any audit committee, compensation committee or board of directors meeting where such matter is being considered, and if he or she is a member of the committee or a director, he or she may not generally vote on such matter at the applicable meeting.

### Duties of Shareholders

Under the Companies Law, a shareholder has a duty to: (i) act in good faith toward the company and other shareholders; and (ii) refrain from abusing his or her power in the company, including, among other things, voting in a general meeting of shareholders with respect to the following matters: (a) any amendment to the articles of association; (b) an increase of the company's authorized share capital; (c) a merger; or (d) approval of interested party transactions which require shareholders' approval.

In addition, any controlling shareholder, or any shareholder who knows that it possesses power to determine the outcome of a shareholder vote and any shareholder who, pursuant to the provisions of a company's articles of association, has the power to appoint or prevent the appointment of an office holder in the company, is under a duty to act with fairness towards the company. The Companies Law does not describe the substance of this duty but states that the remedies generally available upon a breach of contract, will also apply in the event of a breach of the duty of fairness, taking into account such shareholder's position.

## Exemption, Insurance and Indemnification of Directors and Officers

Pursuant to the Companies Law and the Israeli Securities Law, the Israeli Securities Authority (“ISA”) is authorized to impose administrative sanctions, including monetary fines, against companies like ours and their officers and directors for certain violations of the Israeli Securities Law or the Companies Law (see in “Administrative Enforcement” below); and the Companies Law provides that companies like ours may indemnify their officers and directors and purchase an insurance policy to cover certain liabilities, if provisions for that purpose are included in their articles of association.

Our Articles of Association allow us to indemnify and insure our office holders to the fullest extent permitted by law.

### Office Holders’ Exemption

Under the Companies Law, an Israeli company may not exempt an office holder from liability for a breach of his or her duty of loyalty, but may exempt in advance an office holder from his or her liability to the company, in whole or in part, for a breach of his or her duty of care (except in connection with distributions), provided that the articles of association allow it to do so. Our Articles of Association allow us to exempt our office holders to the fullest extent permitted by law.

### Office Holders’ Insurance

Our Articles of Association provide that, subject to the provisions of the Companies Law, we may enter into a contract for the insurance of all or part of the liability imposed on our office holder in respect of an act or omission performed by him or her in his or her capacity as an office holder, regarding each of the following:

- a breach of his or her duty of care to us or to another person;
- a breach of his or her duty of loyalty to us, provided that the office holder acted in good faith and had reasonable cause to assume that his or her act would not prejudice our interests;
- monetary liabilities or obligations imposed upon him or her in favor of another person; and/or
- any other event, occurrence or circumstance in respect of which we may lawfully insure an office holder.

Without derogating from the aforementioned, subject to the provisions of the Companies Law and the Israeli Securities Law, we may also enter into a contract to insure an office holder, in respect of expenses, including reasonable litigation expenses and legal fees, incurred by an office holder in relation to an administrative proceeding instituted against such office holder or payment required to be made to an injured party, pursuant to certain provisions of the Israeli Securities Law.

### Office Holder’s Indemnification

Our Articles of Association provide that, subject to the provisions of the Companies Law and the Israeli Securities Law, we may indemnify any of our office holders for an obligation or expense specified below, imposed on or incurred by the office holder in respect of an act or omission performed in his or her capacity as an office holder, as follows:

- a financial liability imposed on him or her in favor of another person by any judgment, including a settlement or an arbitration award approved by a court.



reasonable litigation expenses, including attorney's fees, incurred by the office holder as a result of an investigation or proceeding instituted against him by a competent authority which concluded without the filing of an indictment against him and without the imposition of any financial liability in lieu of criminal proceedings, or which concluded without the filing of an indictment against him but with the imposition of a financial liability in lieu of criminal proceedings concerning a criminal offense that does not require proof of criminal intent or in connection with a financial sanction (the phrases "proceeding concluded without the filing of an indictment" and "financial liability in lieu of criminal proceeding" shall have the meaning ascribed to such phrases in section 260(a)(1a) of the Companies Law);

reasonable litigation expenses, including attorneys' fees, expended by an office holder or charged to the office holder by a court, in a proceeding instituted against the office holder by the Company or on its behalf or by another person, or in a criminal charge from which the office holder was acquitted, or in a criminal proceeding in which the office holder was convicted of an offense that does not require proof of criminal intent;

expenses, including reasonable litigation expenses and legal fees, incurred by an office holder in relation to an administrative proceeding instituted against such office holder, or payment required to be made to an injured party, pursuant to certain provisions of the Securities Law; and/or

any other event, occurrence or circumstance in respect of which we may lawfully indemnify an office holder.

The Company may undertake to indemnify an office holder as aforesaid: (a) prospectively, provided that, in respect of the first act (financial liability) the undertaking is limited to events which in the opinion of the Board of Directors are foreseeable in light of the Company's actual operations when the undertaking to indemnify is given, and to an amount or criteria set by the Board of Directors as reasonable under the circumstances, and further provided that such events and amount or criteria are set forth in the indemnification undertaking; and (b) retroactively.

#### Limitations on Insurance and Indemnification

The Companies Law provides that a company may not exempt or indemnify an office holder nor enter into an insurance contract which would provide coverage for any monetary liability incurred as a result of any of the following:

a breach by the office holder of his or her duty of loyalty, except that the company may enter into an insurance contract or indemnify an office holder if the office holder acted in good faith and had a reasonable basis to believe that the act would not prejudice the company;

a breach by the office holder of his or her duty of care, if such breach was intentional or reckless, but unless such breach was solely negligent;

any act or omission intended to derive an illegal personal benefit; or

any fine civil fine, financial sanction or monetary settlement in lieu of criminal proceedings imposed on such office holder.

In addition, under the Companies Law, exemption and indemnification of, and procurement of insurance coverage for, our office holders must be approved by our Compensation Committee and our Board of Directors and, with respect to an office holder who is CEO or a director, also by our shareholders. However, according to the Relief Regulations, shareholders' and Board approvals for the procurement of such insurance coverage are not required if the insurance policy is approved by our Compensation Committee and: (i) the terms of such policy are within the framework for insurance coverage as approved by our shareholders and set forth in our Compensation Policy; (ii) the premium paid under the insurance policy is at fair market value; and (iii) the insurance policy does not and may not have a substantial effect on the Company's profitability, assets or obligations.

#### Our Insurance and Indemnification

Indemnification letters, covering indemnification and insurance of those liabilities imposed under the Companies Law and the Israeli Securities Law, as discussed above, were granted to each of our present office holders and were approved for any future office holders.

In addition, in accordance with an amendment made to our Compensation Policy in June 2018, we are currently entitled to hold directors' and officers' liability insurance policy for the benefit of our office holders, with insurance coverage of up to \$45 million and with an annual premium of up to \$400,000, plus an additional annual premium of up to \$180,000 for claims associated with M&A transactions.

Insofar as indemnification for liabilities arising under the United States Securities Act of 1933, as amended, may be permitted to our directors, officers and controlling persons, we have been advised that, in the opinion of the SEC, such indemnification is against public policy as expressed in the Securities Act and is, therefore, unenforceable.

#### Administrative Enforcement

The Israeli Securities Law includes an administrative enforcement procedure to be used by the ISA, to enhance the efficacy of enforcement in the securities market in Israel. This administrative enforcement procedure may be applied to any company or person (including director, officer or shareholder of a company) performing any of the actions specifically designated as breaches of law under the Israeli Securities Law. Furthermore, the Israeli Securities Law requires that the CEO of a company supervise and take all reasonable measures to prevent the company or any of its employees from breaching such law. The CEO is presumed to have fulfilled such supervisory duty if the company adopts internal enforcement procedures designed to prevent such breaches, appoints a representative to supervise the implementation of such procedures and takes measures to correct the breach and prevent its reoccurrence.

As detailed above, under the Israeli Securities Law, a company cannot obtain insurance against or indemnify a third party (including its officers and/or employees) for any administrative procedure and/or monetary fine (other than for payment of damages to an injured party). The Israeli Securities Law permits insurance and/or indemnification for expenses related to an administrative procedure, such as reasonable legal fees, provided that it is permitted under the company's articles of association.

We have adopted and implemented an internal enforcement plan to reduce our exposure to potential breaches of sections in the Companies Law and in the Israeli Securities Law applicable to us. Our Articles of Association and letters of indemnification permit, among others, insurance and/or indemnification as contemplated under the Israeli Securities Law (see "Exemption, Insurance and Indemnification of Directors and Officers" above).

#### Internal Auditor

Under the Companies Law, the board of directors of a public company must appoint an internal auditor proposed by the corporate audit committee (see under "Committees of the Board of Directors" – "Corporate Audit Committee", above). The internal auditor may be an employee of the company but may not be an interested party, an office holder or a relative of the foregoing, nor may the internal auditor be the company's independent accountant or its representative. The role of the internal auditor is to examine, among other things, whether the company's conduct complies with applicable law, integrity and orderly business procedure. The internal auditor has the right to request that the chairman of the corporate audit committee convene a corporate audit committee meeting, and the internal auditor may participate in all corporate audit committee meetings.

We have appointed the firm of Chaikin, Cohen, Rubin & Co., Certified Public Accountants (Isr.) as our internal auditor. Our internal auditor meets the independence requirements of the Companies Law, as detailed above.

#### D. Employees

As of December 31, 2018, we had 958 employees worldwide, of whom 210 were employed in research, development and engineering, 551 in sales and marketing including supporting functions, 81 in management and administration and 116 in operations. Of these employees, 334 were based in Israel, 44 were based in the United States, 207 were based in EMEA (not including Israel), 204 were based in Latin America and 139 were based in Asia Pacific.

In addition, during 2018 we have employed an average of 157 temporary employees, primarily in India, supporting the projects we have won in this country. The majority of the costs of these temporary employees were included in the cost of revenues in our financial statement.

We and our Israeli employees are not parties to any collective bargaining agreements. However, with respect to such employees, we are subject to Israeli labor laws, regulations and collective bargaining agreements applicable to us by extension orders of the Israeli Ministry of Social Affairs and Social Services, as are in effect from time to time. Generally, we provide our employees with benefits and working conditions above the legally required minimums.

Israeli law generally and applicable extension orders require severance pay upon the retirement or death of an employee or termination without due cause, payment to pension funds or similar funds in lieu thereof and require us and our employees to make payments to the National Insurance Institute, which is similar to the U.S. Social Security Administration. Such amounts also include payments by the employee for mandatory health insurance.

Substantially all of our employment agreements include employees' undertakings with respect to non-competition, assignment to us of intellectual property rights developed in the course of employment and confidentiality. However, it should be noted that the enforceability of non-competition undertakings is rather limited under the local laws in certain jurisdictions, including Israel.

To date, we have not experienced labor-related work stoppages and believe that our relations with our employees are good.

The employees of our other subsidiaries are subject to local labor laws and regulations that vary from country to country. In certain locations such as Brazil and Norway we are a party to collective bargaining agreements.

### Share Ownership

The following table sets forth certain information regarding the ordinary shares owned, and stock options held, by our directors and senior management as of March 28, 2019. The percentage of outstanding ordinary shares is based on 80,141,935 ordinary shares outstanding as of March 27, 2019.

Name	Number of Ordinary Shares <sup>(1)</sup>	Percentage of Outstanding Ordinary Shares	Number of Stock Options Held <sup>(2)</sup>	Exercise price of Options	Number of RSUs Held <sup>(2)</sup>
Zohar Zisapel <sup>(3)</sup>	10,593,885	13.22	350,000	\$ 2.02 - 2.06	-
Ira Palti	845,835	1.06	1,225,000	\$ 1.14 - 1.14	-
All directors and senior management as a group consisting of 17 people <sup>(4)</sup>	12,633,769	15.76	3,652,630	\$ - 13.04	44,776

(1) Consists of ordinary shares and options to purchase ordinary shares which are vested or shall become vested within 60 days of March 28, 2019.

(2) Each stock option is exercisable into one ordinary share and expires between 6 and 10 years from the date of its grant. Of the number of stock options listed, 350,000, 845,835 and 2,389,884 options, are vested or shall become vested within 60 days of March 28, 2019 for Mr. Zisapel, Mr. Palti and all directors and senior management as a group, respectively. No RSUs listed are vested or expected to vest within 60 days of March 28, 2019.

(3) The number of ordinary shares held by Zohar Zisapel includes 18,717 shares held by RAD Data Communications Ltd., of which Mr. Zisapel is a principal shareholder and a director.

(4) Each of the directors and senior management other than Messrs. Zohar Zisapel and Ira Palti, beneficially owns less than 1% of the outstanding ordinary shares as of March 28, 2019 (including options held by each such person and which are vested or shall become vested within 60 days of March 28, 2019) and have therefore not been separately listed.

### Stock Option Plan

#### The Amended and Restated Share Option and RSU Plan

In September 2003, our shareholders approved and adopted our 2003 share option plan, designed to grant options pursuant to Section 102 or 3(i) of the Ordinance, and to be a "qualified plan" as defined by U.S. tax law. Our worldwide

employees, directors, consultants and contractors are eligible to participate in this plan. Our Compensation Committee of our Board of Directors administers the plan. Generally, options granted under this plan expire between six to ten years from the date of grant. In addition, our Board of Directors has sole discretion to determine, in the event of a transaction with another corporation, as defined in the plan, that each option shall either: (i) be substituted for an option to purchase securities of the other corporation; (ii) be assumed by the other corporation; or (iii) automatically vest in full. In the event that all or substantially all of the issued and outstanding share capital of the company shall be sold, each option holder shall be obligated to participate in the sale and to sell his/her options at the price equal to that of any other share sold.

In September 2010, our Board of Directors amended the share option plan so as to enable the grant of RSUs pursuant to such plan (the “Amended and Restated Share Option and RSU Plan”, or “the Plan”).

In December 2012, our Board of Directors extended the Plan for an additional ten-year period through December 31, 2022. The Plan has been approved by the Israeli Tax Authority as required by applicable law. The following tables present information regarding option and RSU grants under the Plan as of December 31, 2018.

Cumulative Ordinary Shares Reserved for Option and RSU Grants (1)	Remaining Reserved Shares Available for Option and RSU Grants	Options and RSUs Outstanding (2)	Weighted Average Exercise Price (3)
23,835,688	1,109,446	7,505,228	\$ 3.99

(1) Total of 2,047,997 relates to RSU grants and 21,787,691 relates to option grants

(2) Total of 376,811 relates to RSUs outstanding and 6,751,606 relates to options outstanding

(3) Weighted average price refers only to options

The following table presents certain option and RSU grant information concerning the distribution of options and RSUs (granted under the Plan) among directors and employees of the Company as of December 31, 2018:

	Options and RSUs Outstanding	Unvested Options and RSUs
Directors and senior management	3,915,982	1,464,363
All other grantees	3,212,435	1,513,467

#### Amendment of the Plan

Subject to applicable law, our Board of Directors may amend the Plan, provided that any action by our Board of Directors which will alter or impair the rights or obligations of an option holder requires the prior consent of that option holder. Our board last amended the Plan in August 2014, extending the authority originally granted to our Compensation Committee to provide grantees, in their notice of grant, with a “Double Trigger” acceleration mechanism upon the occurrence of certain events.

#### ITEM 7. MAJOR SHAREHOLDERS AND RELATED PARTY TRANSACTIONS

##### Major Shareholders

The following table sets forth stock ownership information as of March 28, 2019 (unless otherwise noted below) with respect to each person who is known by us to be the beneficial owner of more than 5% of our outstanding ordinary shares, based on information provided to us by the holders or disclosed in public filings with the SEC.



Except where otherwise indicated, and except pursuant to community property laws, we believe, based on information furnished by such owners, that the beneficial owners of the ordinary shares listed below have sole investment and voting power with respect to such shares. The shareholders listed below do not have any different voting rights from any of our other shareholders. We know of no arrangements which would, at a subsequent date, result in a change of control of our company.

Total shares beneficially owned in the table below include shares that may be acquired upon the exercise of options that are exercisable within 60 days. The shares that may be issued under these options are treated as outstanding only for purposes of determining the percent owned by the person or group holding the options but not for the purpose of determining the percentage ownership of any other person or group. Each of our directors and officers who is also a director or officer of an entity listed in the table below disclaims ownership of our ordinary shares owned by such entity.

Name	Number of Ordinary Shares <sup>(2)</sup>	Percentage of Outstanding Ordinary Shares <sup>(1)</sup>	
Zohar Zisapel <sup>(3)</sup>	10,593,885	13.22	%
Joseph D. Samberg <sup>(4)</sup>	7,784,842	9.71	%
Renaissance Technologies LLC <sup>(5)</sup>	4,052,658	5.06	%

(1)Based on 80,141,935 ordinary shares outstanding as of March 27, 2019.

(2) Consists of ordinary shares and options to purchase ordinary shares, which are vested or shall become vested within 60 days as of March 28, 2019.

Zohar Zisapel's address is 24 Raoul Wallenberg St., Tel Aviv 69719, Israel. The ordinary shares held by Zohar (3)Zisapel include 18,717 shares held by RAD Data Communications Ltd., of which Mr. Zisapel is a principal shareholder and a director.

(4)Joseph D. Samberg's address is 1091 Boston Post Road, Rye, NY 10580.

(5) The principal business address of Renaissance Technologies LLC's address is 800 Third Avenue New York, NY 10022

As of March 25, 2019, approximately 97% of our ordinary shares were registered for trade and held in the United States and there were 25 record holders with addresses in the United States. These numbers are not representative of the number of beneficial holders of our shares nor are they representative of where such beneficial holders reside due to the fact that many of these ordinary shares were held of record by brokers or other nominees (including one U.S. nominee company, CEDE & Co., which held approximately 96.9% of our outstanding ordinary shares as of said date).

#### Related Party Transactions

Zohar Zisapel, the Chairman of our Board of Directors and a principal shareholder of our company, beneficially owns 13.22% of our ordinary shares as of March 28, 2019. Yehuda Zisapel, the brother of Zohar Zisapel, is also a shareholder, who together with Nava Zisapel beneficially owns 4.46% of our ordinary shares as of March 28, 2019. Zohar and Yehuda Zisapel do not vote as a group and do not have a voting agreement. Yehuda and Nava Zisapel have an agreement, which provides for certain coordination in respect of sales of shares of our company as well as for tag along rights with respect to off-market sales of our company's shares.



Zohar Zisapel is the Chairman of the board of, and holds shares in, RADWIN Ltd., RADIFLOW Ltd., Hailo Technologies Ltd.; Hi Auto Ltd. and Innoviz Ltd. He also serves as a director in the following companies, in a few of which he holds shares: RADCOM Ltd., NUANCE HEARING Ltd., RAD Data Communications Ltd., Packetlight Networks Ltd., CyberInt Technologies Ltd., Armis Security Ltd., Cylus Ltd.; and several other private holdings and real estate. Zohar Zisapel also holds more than 5% of the shares of the following companies: Satixfy Ltd., Nucleix Ltd., Silicom Ltd., Vascular Grafts Solutions Ltd., Perflow Ltd., Vectorious Ltd. and Varada Ltd. The above list does not constitute a complete list of Zohar Zisapel's holdings.

Yehuda Zisapel holds shares and serves as a director in a few of the above-mentioned companies, as well as in additional companies, including: RADWARE Ltd., Bynet Data Communications Ltd., Bynet Electronics Ltd., Bynet Semech (Outsourcing) Ltd., Bynet Systems Applications Ltd., Ab-Net Communications Ltd., Bynet Software Systems Ltd., Internet Binat Ltd., SecurityDam Ltd., Binat Business Ltd, RAD ACE –Ltd. RAD Cloud Ltd. and several other private holdings, real estate and medical devices companies. The above list does not constitute a complete list of Yehuda Zisapel's holdings.

Some of the companies referred to above are known as the "RAD-BYNET Group", a group of independent companies. Members of the RAD-BYNET Group sometimes share expenses with us, on an as-needed basis, for information systems infrastructure, administrative services, medical insurance, as well as in connection with logistics services, such as transportation and cafeteria facilities - all by arm's length transactions. In addition, the Company purchases certain equipment, other services, software and licenses from members of the RAD-BYNET Group. The aggregate amount of such purchases and shared expenses in 2018 was approximately \$2.0 million.

We, as well as other companies of the RAD-BYNET Group, may market through the same distribution channels. In addition, the Company markets and sells some products of other members of the RAD-BYNET Group, which are complementary to our products, while some members of the RAD-BYNET Group market and sell part of our products, which are complimentary to their products. Certain products of members of the RAD-BYNET Group may be used in place of (and thus may be deemed to be competitive with) our products.

Ms. Yael Langer, one of our directors, acts as general counsel for several RAD-BYNET Group companies and serves as a director in RADWARE Ltd.

We generally ascertain the market prices for goods and services that can be obtained at arms' length from unaffiliated third parties before entering into any transaction with a related party. In addition, all of our related-party transactions with members of the RAD-BYNET Group are approved by our Corporate Audit Committee and then by our Board of Directors. As a result, we believe that the terms of the transactions in which we have engaged, and are currently engaged with other members of the RAD-BYNET Group are beneficial to us and no less favorable to us than terms, which might be available to us from unaffiliated third parties. Any future transaction and arrangement with entities in which our office holders may have a personal interest will require approval by our Corporate Audit Committee, our Board of Directors and, if applicable, our shareholders.

During 2018, the Company signed commercial agreements with Orocom, a new operator in Peru, to provide broadband connectivity in rural regions. The Peruvian Government ("Fitel") chose Orocom for the deployment of transport and broadband access networks in three of six regions in Peru. Orocom is owned by a consortium of companies, comprising of telecommunications license holders as well as companies with expertise in fiber-based technologies.

After signing the commercial agreements mentioned above and an operating agreement with Orocom and its shareholders, the Company provided, in the second quarter of 2018, bank guarantees amounting to \$29.1 million, on behalf of Orocom to Fitel. For more details concerning the Fitel project and the bank guarantees provided on behalf of Orocom to Fitel, please see Item 18. FINANCIAL STATEMENTS – "Notes to Consolidated Financial Statements" Note 11 and Note 17.

As part of the operating agreement with Orocom, the Company has two seats in Orocom's board of directors, which comprise half of Orocom's board seats, as well as other protective rights in Orocom. As a result, Orocom and its shareholders were defined as related companies of Ceragon. During 2018, Amitel Perú Telecomunicaciones S.A.C. ("Amitel") - one of Orocom's shareholders and a partner in the Fitel project – won a tender of Ceragon for the provision of site surveys services in the sum of approximately \$ 490,000.

In December 2018, we purchased 11% of the share capital of Compass Networks LTD ("Compass") for a consideration of \$ 833. The investment was accounted for based on the equity method. For more details concerning Compass, please see Item 18. FINANCIAL STATEMENTS – "Notes to Consolidated Financial Statements" Note 1b and Note 17.

### Lease Arrangements

We lease most of our office space for our current headquarters and principal administrative, finance, marketing and sales operations from real estate holding companies controlled by Yehuda and Zohar Zisapel. The leased facility, located in Tel Aviv, Israel is approximately 59,300 square feet of office space and approximately 4,000 square feet of warehouse space. The leases for this facility will expire at the end of December 2020. In 2018, the aggregate amount of rent and maintenance expenses related to these properties was approximately \$2.0 million.

### Supply Arrangement

We purchase products from certain RAD-BYNET Group companies, which we integrate into our products or product offerings. The aggregate purchase price of these components in 2018 was approximately \$0.1 million.

### Sales Arrangement

We sell products through RAD-BYNET Group companies, which they integrate into their products or product offerings. The aggregate selling price of these components in 2018 was approximately \$0.1 million.

### Registration Rights

In connection with the private placement of preferred shares before our initial public offering in August 2000, several of our shareholders were granted registration rights with respect to ordinary shares that were converted from preferred shares immediately prior to the completion of our initial public offering. The registration rights were granted to each of:

- the holders of the ordinary shares resulting from the conversion of such preferred shares; and
- Yehuda Zisapel and Zohar Zisapel.

Under the registration rights agreement, each of these shareholders has the right to have its ordinary shares included in certain of our registration statements.

## ITEM 8. FINANCIAL INFORMATION

### Consolidated Statements and Other Financial Information

The annual financial statements required by this Item are found at the end of this annual report, beginning on Page F-1.

### Export Sales

In 2018, our sales to end users located outside of Israel amounted to \$341.2 million, or 99.2% of our \$343.9 million revenues for this year.

### Legal Proceedings

On January 5, 2015, a motion to approve a purported class action, naming the Company, its CEO and its directors as defendants, was filed with the District Court of Tel-Aviv (Economic Department), on behalf of holders of ordinary shares, including those who purchased shares during the period following the Company's follow on public offering in July 2014 (the "Motion").

The purported class action is based on Israeli law and alleges breaches of duties by the Company and its management on account of false and misleading statements in the Company's SEC filings and public statements, during the period between July and October 2014. The plaintiff's principal claim is that immediately prior to the follow on public offering, the defendants presented misleading guidance concerning the expected financial results for the third quarter of 2014, indicating an anticipated improvement in the rate of gross profit based on orders which were already received by the Company at the time of such presentation. Although the plaintiff admits that, in accordance with the actual results for the third quarter, the Company did meet the guidance as far as revenues were concerned, the actual rate of gross profit turned out to be much lower than the one anticipated. Plaintiff argues that at the time such guidance was presented by the defendants, they already knew, or should have known, that it was incorrect. The plaintiff seeks specified compensatory damages in a sum of up to \$75,000,000, as well as attorneys' fees and costs.

The Motion was served to the Company on January 6, 2015 and the Company filed its response on June 21, 2015. On October 22, 2015, the plaintiff filed a request for discovery of specific documents. The Company filed its response to the plaintiffs' request for discovery on January 25, 2016, and the plaintiffs submitted their response on February 24, 2016. On June 8, 2016, the District Court partially accepted the plaintiff's request for discovery, and ordered the Company to disclose some of the requested documents. The Company's request to appeal this decision was denied by the Supreme Court on October 25, 2016, and the Company disclosed the required documents to the plaintiffs. The plaintiffs filed their reply to the Company's response to the Motion on April 2, 2017.

In May 2017 the Company filed two requests: the first, requesting to dismiss the Plaintiff's response to the Company's defense, or, alternatively, to allow the Company to respond to it; the second, to first hear the Company's claims with regards to the legal question of the governing law. A preliminary hearing was held on May 22, 2017, where the court set dates for response to the Company's above-mentioned requests and for evidence hearings. On July 17, 2017, the court allowed the Company to respond to the plaintiff's response and on July 29, 2017 the Court denied the Company's second request. The Company filed its response to the plaintiff's response on September 18, 2017.

On October 2, 2017, the plaintiff filed a request to summon our Chairman of the Board, Mr. Zisapel, and our CEO, Mr. Palti, to the upcoming evidence hearing. The Company filed its response to this request on October 26, 2017; and the plaintiff filed its reply to Company's response.

The first evidence hearing took place on November 2, 2017. During this hearing the Company agreed to consider summoning to the second evidence hearing one of the above-mentioned Company's officers, and on November 8, 2017, the Company advised the court that it agrees that Mr. Palti will be summoned to the next evidence hearing. The second and final evidence hearing took place on January 8, 2018.

The Plaintiff submitted his summaries on March 21, 2018. The Company and its officers submitted their summaries on June 12, 2018; The Plaintiff submitted his reply summaries on September 5, 2018.

On October 4, 2018, an interim decision regarding dual listed companies, which corresponds with the Company's arguments in this case, was rendered by the Supreme Court of Israel. This Supreme Court's decision upholds two recent rulings of the District Court of Tel-Aviv (Economic Department), which determined that all securities litigation regarding dual listed companies should be determined only in accordance with US law. One of these District Court rulings dismissed a motion to approve a class action, on the sole basis that the motion relied on Israeli law. The Israeli Supreme Court issued its final ruling in that case on October 16<sup>th</sup>, 2018 and repeated its principle decision to accept the District Court' rulings regarding application of US law to claims regarding dual listed companies.

In light of the above decision, on October 15, 2018, the Plaintiff requested from District Court to add a plea to his summaries. The District Court has approved and gave the Company the right to reply, and the Company's response was submitted on December 4, 2018. Plaintiff's reply was submitted on December 26, 2018.

The Company awaits the court's decision whether to approve the Motion or to deny it.

The Company believes that it has a strong defense against the allegations referred to in the Motion and that the District Court should deny it.

We are not a party to any other material legal proceedings.

#### Dividends

We have never declared or paid any dividend on our ordinary shares except for the share dividend that was paid as a result of a 250-for-1 share recapitalization that took place immediately prior to our initial public offering. We do not anticipate paying any dividends on our ordinary shares in the future. We currently intend to retain all future earnings to finance our operations and to expand our business. In connection with the 2013 credit facility, we undertook not to

distribute dividends (unless certain terms are met) without the Lender's prior written consent.

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## Significant Changes

See Item 5. “OPERATING AND FINANCIAL REVIEW AND PROSPECTS -Liquidity and Capital Resources” for a description of the February 2018 and March 2018 amendments to the credit facility.

## ITEM 9. THE OFFER AND LISTING

### Offer and Listing Details

Since January 3, 2011, our ordinary shares have been listed on the Nasdaq Global Select Market under the symbol “CRNT”. Between September 12, 2004 and December 11, 2017 our shares were also listed on the Tel Aviv Stock Exchange (“TASE”), under the same symbol.

## ITEM 10. ADDITIONAL INFORMATION

### Memorandum and Articles of Association – General

A description of our Memorandum and Articles of Association was previously provided in our registration statement on Form F-1 (Registration Statement 333-12312) filed with the SEC on August 3, 2000, and is incorporated herein by reference. The Memorandum and Articles of Association - as amended in October 2007, September 2011, December 2012, July 2014 and September 2016 - were previously provided in our annual reports on Form 20-F for the years 2007, 2011, 2012, 2014 and 2016, respectively, and are incorporated herein by reference.

In July 2014, we revoked our Memorandum pursuant to procedures provided by Israeli law; a detailed description of such procedure was previously provided in our annual report on Form 20-F for the year 2014 and is incorporated herein by reference.

### Articles of Association

### Objects and purposes

Our registration number with the Israeli Registrar of Companies is 51-235244-4. Our purpose as set forth in article 1 to our Articles of Association is to engage, directly or indirectly, in any lawful undertaking or business whatsoever.

### Meetings of Shareholders, Quorum and Voting Rights

According to the Companies Law and our Articles of Association, an annual general meeting of our shareholders shall be held once every calendar year, provided it is within a period of not more than fifteen (15) months after the preceding annual general meeting. Our Board of Directors may, whenever it deems fit, convene a special general meeting at such time and place as may be determined by the board, and, pursuant to the Companies Law, must convene a meeting upon the demand of: (a) two directors or one quarter of the directors in office; or (b) the holder or holders of: (i) 5% or more of the Company’s issued share capital and one percent 1% or more of its voting rights; or (ii) 5% or more of the Company’s voting rights.

Under our Articles of Association, the quorum required for a meeting of shareholders consists the presence, in person or by proxy, of at least two shareholders holding shares conferring in the aggregate twenty five percent (25%) or more of the voting power of the Company. If within half an hour from the time appointed for the meeting a quorum is not present, the meeting, if convened by the Board of Directors upon the demand of shareholders or upon the demand of less than 50% of the directors then in office or directly by such shareholders or directors, shall be cancelled. If a meeting is otherwise called and no quorum is present within half an hour from the time appointed for such meeting it shall stand adjourned to the same day in the following week at the same time and place or to such other day, time and

place as the Chairman of the meeting may determine with the consent of the holders of a majority of the voting power represented at the meeting in person or by proxy and voting on the question of adjournment. At the adjourned meeting, the required quorum consists of any two shareholders.

Subject to the provisions of the Articles of Association, holders of fully paid ordinary shares have one vote for each ordinary share held by such shareholder of record, on all matters submitted to a vote of shareholders. Shareholders may vote in person, by proxy or by proxy card. These voting rights may be affected by the grant of any special voting rights to the holders of a class of shares with preferential rights that may be authorized in the future. As our ordinary shares do not have cumulative voting rights in the election of directors, the holders of the majority of the shares present and voting at a shareholders meeting generally have the power to elect all of our directors, except the external directors whose election requires a special majority.

Unless otherwise prescribed in our Articles of Association and/or under the Companies Law, shareholders resolutions are deemed adopted if approved by the holders of a majority of the voting power represented at the meeting in person, by proxy or by proxy card, and voting on the matter.

#### Share Ownership Restrictions

The ownership or voting of ordinary shares by non-residents of Israel is not restricted in any way by the Articles of Association or the laws of the State of Israel, except that citizens of countries that are in a state of war with Israel may not be recognized as owners of ordinary shares.

#### Transfer of Shares

Our ordinary shares which have been fully paid-up are transferable by submission of a proper instrument of transfer together with the certificate of the shares to be transferred and such other evidence of title, as the Board of Directors may require, unless such transfer is prohibited by another instrument or by applicable securities laws.

#### Modification of Class Rights

Pursuant to our Articles of Association, if at any time the share capital is divided into different classes of shares, the rights attached to any class, unless otherwise provided by our Articles of Association, may be modified or abrogated by the Company, by shareholders resolution, subject to the requirement that such resolution is also approved by a majority of the holders of the shares of such applicable class, who are present and voting at a separate general meeting of the holders of the shares of such class.

#### Dividends

Under the Companies law, dividends may be distributed only out of profits available for dividends as determined by the Companies Law, provided that there is no reasonable concern that the distribution will prevent the Company from being able to meet its existing and anticipated obligations when they become due. If the company does not meet the profit requirement, a court may nevertheless allow the company to distribute a dividend, as long as the court is convinced that there is no reasonable concern that such distribution will prevent the company from being able to meet its existing and anticipated obligations when they become due. Pursuant to our Articles of Association, no dividend shall be paid otherwise than out of the profits of the Company. Generally, under the Companies Law, the decision to distribute dividends and the amount to be distributed is made by a company's board of directors.

Our Articles of Association provide that our Board of Directors, may, subject to the Companies Law, from time to time, declare and cause the Company to pay such dividends as may appear to the Board of Directors to be justified by the profits of our Company. Subject to the rights of the holders of shares with preferential, special or deferred rights that may be authorized in the future, our profits which shall be declared as dividends shall be distributed according to the proportion of the nominal (par) value paid up or credited as paid up on account of the shares held at the date so appointed by the Company and in respect of which such dividend is being paid, without regard to the premium paid in excess of the nominal (par) value, if any. The declaration of dividends does not require Shareholders' approval.

To date, we have not declared or distributed any dividend and we currently do not intend to pay cash dividends on our ordinary shares in the foreseeable future; see above under Item 8. "FINANCIAL INFORMATION – Dividends."

#### Liquidation Rights

In the event of our winding up or liquidation or dissolution, subject to applicable law, our assets available for distribution among the shareholders shall be distributed to the holders of ordinary shares in proportion to the amount paid up or credited as paid up on account of the nominal value of the shares held by them respectively and in respect

of which such distribution is being made, without regard to any premium paid in excess of the nominal value, if any. This liquidation right may be affected by the grant of limited or preferential rights as to liquidation to the holders of a class of shares that may be authorized in the future.

## Mergers and Acquisitions under Israeli Law

In general, a merger of a company, that was incorporated before the enactment of the Companies Law, requires the approval of the holders of a majority of 75% of the voting power represented at the annual or special general meeting in person or by proxy or by a written ballot, as shall be permitted, and voting thereon in accordance with the provisions of the Companies Law. However, in accordance with our Articles of Association, a shareholder resolution approving a merger (as defined in the Companies law) of the Company shall be deemed adopted if approved by the holders of a majority of the voting power represented at the meeting in person or by proxy and voting thereon. Upon the request of a creditor of either party of the proposed merger, the court may delay or prevent the merger if it concludes that there exists a reasonable concern that as a result of the merger, the surviving company will be unable to satisfy the obligations of any of the parties to the merger. In addition, a merger may not be completed unless at least: (i) 50 days have passed from the time that the requisite proposal for the merger has been filed by each party with the Israeli Registrar of Companies; and (ii) 30 days have passed since the merger was approved by the shareholders of each party.

The Companies Law also provides that, an acquisition of shares in a public company must be made by means of a tender offer: (a) if there is no existing shareholder, or a group of shareholders holding shares together, in the company holding shares conferring 25% or more of the voting rights at the general meeting (a “control block”), and as a result of the acquisition the purchaser would become a holder of a control block; or (b) if there is no existing shareholder, or a group of shareholders holding shares together, in the company holding shares conferring 45% or more of the voting rights at the general meeting and as a result of the acquisition the purchaser would become a holder of 45% or more of the voting rights at the general meeting. Notwithstanding, the abovementioned requirements do not apply if the acquisition was: (1) made by way of a private placement that received shareholders’ approval (which includes an explicit approval that the purchaser will become, as a result of such acquisition, a holder of a “control block,” or of 45% or more of the voting power in the company, and unless there is already a holder of a “control block” or of 45% or more of the voting power in the company, respectively); (2) was from a holder of a “control block” in the company and resulted in the acquirer becoming a holder of a “control block”; or (3) was from a holder of 45% or more of the voting power in the company and resulted in the acquirer becoming a holder of 45% or more of the voting power in the company. The tender offer must be extended to all shareholders, but the offeror is not required to purchase more than 5% of the company’s outstanding shares, regardless of how many shares are tendered by shareholders. The tender offer may be consummated only if: (i) at least 5% of the company’s outstanding shares will be acquired by the offeror; and (ii) the number of shares acquired in the offer exceeds the number of shares whose holders objected to the offer.

If as a result of an acquisition of shares, the acquirer will hold more than 90% of a company’s outstanding shares, the acquisition must be made by means of a tender offer for all of the outstanding shares. If as a result of such full tender offer the acquirer would own more than 95% of the outstanding shares, then all the shares that the acquirer offered to purchase (i.e. all of the shares not owned by the acquirer) will be transferred to it. The law provides for appraisal rights if any shareholder files a request in court within six months following the consummation of a full tender offer, but the acquirer will be entitled to stipulate that tendering shareholders forfeit their appraisal rights. If as a result of a full tender offer the acquirer would own 95% or less of the outstanding shares, then the acquirer may not acquire shares that will cause his shareholding to exceed 90% of the outstanding shares.

Furthermore, certain provisions of other Israeli laws may have the effect of delaying, preventing or making more difficult an acquisition of or merger with us; see Item 3. “KEY INFORMATION - Risk Factors – Risks Related to Operations in Israel - Provisions of our Articles of Association, Israeli law and financing documents could delay, prevent or make difficult a change of control and therefore depress the price of our shares.”

## Material Contracts

None.

## Exchange Controls

There are currently no Israeli currency control restrictions on payments of dividends or other distributions with respect to our ordinary shares or the proceeds from the sale of the shares, except for the obligation of Israeli residents to file reports with the Bank of Israel regarding certain transactions. However, legislation remains in effect pursuant to which currency controls can be imposed by administrative action at any time.

The ownership or voting of our ordinary shares by non-residents of Israel, except with respect to citizens of countries which are in a state of war with Israel, is not restricted in any way by our Memorandum or Articles of Association or by the laws of the State of Israel.

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## Taxation

The following is a short summary of the tax environment to which shareholders may be subject. The following is not intended, and should not be construed, as legal or professional tax advice and is not exhaustive of all possible tax considerations. Each individual should consult his or her own tax or legal advisor.

This summary is based on the current provisions of tax law and, except for the foregoing, does not anticipate any possible changes in law, whether by legislative, regulatory, administrative or judicial action. Holders of our ordinary shares should consult their own tax advisors as to the United States, Israeli or other tax consequences of the purchase, ownership and disposition of ordinary shares.

### General Corporate Tax Structure in Israel

The corporate tax rate in 2015 was 26.5%. The corporate tax rate as from January 1, 2016 is 25%. In December 2016 the Israeli Parliament approved a reduction in the corporate income tax rate to 24% effective from January 1, 2017 and 23% for 2018 and thereafter.

However, the effective tax rate payable by a company that derives income from an approved enterprise, beneficiary enterprise, or preferred enterprise discussed further below, may be considerably lower. See “The Law for the Encouragement of Capital Investments, 1959” (the “Investment Law”) below.

### The Law for the Encouragement of Capital Investments, 1959

In general, the Investment Law is intended to provide tax benefits to Industrial Enterprises who undertake significant export activities leading to the economic competitiveness of the country. The Investment Law underwent several amendments in recent years as will be detailed below, however, benefits which were granted under prior versions of the law remain intact and may be applied to the extent the company who obtained such benefits continues to comply with the respective requirements and has not waived such benefits.

### Tax Benefits before the 2005 amendment

The Investment Center has granted approved enterprise status to three investment programs at our former facility in Tel Aviv and we have derived and expect to continue to derive a substantial portion of our income from these programs. We have elected the alternative package of benefits under these approved enterprise programs. The portion of our income derived from these approved enterprise programs will be exempt from tax for a period of two years commencing in the first year in which there is taxable income. The period of tax benefits for our approved enterprise programs has not yet commenced, because we have yet to realize taxable income.

The benefit period starts with the first year the enterprise earns taxable income, provided that 14 years have not passed since the approval was granted and 12 years have not passed since the enterprise began operating (“limitation period”). As of January 1<sup>st</sup> 2018 the 14 years period have passed for the three approved programs. The respective benefit period has not yet begun, as no taxable income was generated.

The Company believes it will continue to enjoy its current tax benefits in accordance with the provisions of the Investment Law prior to the 2005 Amendment.

### Tax Benefits under the 2005 Amendment

On April 1, 2005, an amendment to the Investments Law (the “Amendment”) came into force. The Amendment includes revisions to the criteria for investments qualified to receive tax benefits as an approved enterprise. The Amendment

applies to new investment programs and investment programs commencing after 2004, and does not apply to investment programs approved prior to December 31, 2004, whose benefits will remain as they were on the date of such approval. However, a company that was granted benefits according to section 51 of the Investments Law (prior to the amendment) would not be allowed to choose a new tax year as a year of election (as described below) under the new amendment for a period of 2 years from the company's previous year of commencement under the old Investments Law.



Tax benefits are available under the Amendment to production facilities (or other eligible facilities), which are generally required to derive more than 25% of their business income from exports (referred to as a “Benefited Enterprise”). In order to receive the tax benefits, the 2005 Amendment states few conditions such as an investment in the Benefited Enterprise exceeding a certain percentage or a minimum amount specified in the Investments Law. Such investment may be made over a period of no more than three years ending at the end of the year in which the company requested to have the tax benefits apply to the Benefited Enterprise (the “Year of Election”). A company wishing to receive the tax benefits afforded to a Benefited Enterprise is required to select the tax year from which the period of benefits under the Investments Law are to commence by notifying the Israeli Tax Authority within 12 months of the end of that year.

The benefits under the Benefited Enterprise are an exemption from tax for a period of 2 years commencing in the first year in which there is a taxable income, following the year of election, and will be subject to a reduced corporate income tax rate of 10% to 25% for the remaining period of the tax benefits. The duration of tax benefits is subject to a limitation of the earlier of 7 to 10 years from the Commencement Year, or 12 years from the first day of the Year of Election.

The 2005 Amendment changed the definition of “foreign investment” in the Investments Law so that the amended definition requires a minimal investment of NIS 5 million by foreign investors. Furthermore, such definition also includes the purchase of shares of a company from another shareholder, provided that the company’s outstanding and paid-up share capital exceeds NIS 5 million. Such changes to the definition of “foreign investment” took effect retroactively from 2003.

In addition, a company that is Abundant in Foreign Investment (owned by at least 74% foreign shareholders and has undertaken to invest a minimum sum of \$20 million in the Benefited Enterprise) is entitled to an extension of the benefits period by an additional five years, depending on the rate of its income that is derived in foreign currency.

The benefits available to an approved enterprise and/or Benefited Enterprise are conditional upon the fulfillment of conditions stipulated in the Investments Law and its regulations as described above and criteria in rulings issued by the Israeli Tax Authorities. If a company does not meet these conditions, in whole or in part, it would be required to refund the amount of tax benefits, with the addition of the consumer price index linkage adjustment and interest.

Among the results of the 2005 Amendment are that (a) tax-exempt income generated under the provisions of the 2005 Amendment will trigger a claw back on the exempt income upon distribution or liquidation and (b) we may be required to record a deferred tax liability with respect to such tax-exempt income. As of December 31, 2018, the Company did not generate income under the provisions of the 2005 amendment.

The Company has elected 2006 and 2009 as election years as a Benefited Enterprise.

#### Tax Benefits under the 2017 Amendment

The 2017 Amendment was enacted as part of the Economic Efficiency Law that was published on December 29, 2016 and is effective as of January 1, 2017. The 2017 Amendment provides new tax benefits for two types of “Technology Enterprises”, as described below, and is in addition to the other existing tax beneficial programs under the Investment Law.

The 2017 Amendment provides that a technology company satisfying certain conditions will qualify as a “Preferred Technology Enterprise” and will thereby enjoy a reduced corporate tax rate of 12% on income that qualifies as “Preferred Technology Income”, as defined in the Investment Law. The tax rate is further reduced to 7.5% for a Preferred Technology Enterprise located in development Zone A. In addition, a Preferred Technology Enterprise will enjoy a reduced corporate tax rate of 12% on capital gain derived from the sale of certain “Benefitted Intangible Assets” (as defined in the Investment Law) to a related foreign company if the Benefitted Intangible Assets were acquired

from a foreign company on or after January 1, 2017 for at least NIS 200 million, and the sale receives prior approval from the National Authority for Technological Innovation, or NATI.

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The 2017 Amendment further provides that a technology company satisfying certain conditions will qualify as a “Special Preferred Technology Enterprise” and will thereby enjoy a reduced corporate tax rate of 6% on “Preferred Technology Income” regardless of the company’s geographic location within Israel. In addition, a Special Preferred Technology Enterprise will enjoy a reduced corporate tax rate of 6% on capital gain derived from the sale of certain “Benefitted Intangible Assets” to a related foreign company if the Benefitted Intangible Assets were either developed by an Israeli company or acquired from a foreign company on or after January 1, 2017, and the sale received prior approval from NATI. A Special Preferred Technology Enterprise that acquires Benefitted Intangible Assets from a foreign company for more than NIS 500 million will be eligible for these benefits for at least ten years, subject to certain approvals as specified in the Investment Law.

Dividends distributed by a Preferred Technology Enterprise or a Special Preferred Technology Enterprise, paid out of Preferred Technology Income, are generally subject to withholding tax at source at the rate of 20% or such lower rate as may be provided in an applicable tax treaty (subject to the receipt in advance of a valid certificate from the Israel Tax Authority allowing for a reduced tax rate). However, if such dividends are paid to an Israeli company, no tax is required to be withheld. If such dividends are distributed to a foreign company and other conditions are met, the withholding tax rate will be 4%.

#### Tax Benefits and Grants for Research and Development

Israeli tax law allows, under specific conditions, a tax deduction in the year incurred for expenditures, including capital expenditures, relating to scientific research and development projects, for the year in which they are incurred if:

- the expenditures are approved by the relevant Israeli government ministry, determined by the field of research;
- the research and development is for the promotion or development of the company; and
- the research and development is carried out by or on behalf of the company seeking the deduction.

However, the amount of such deductible expenses shall be reduced by the sum of any funds received through government grants for the finance of such scientific research and development projects. Expenditures not so approved are deductible over a three-year period if the R&D is for the promotion or development of the company.

#### Tax Benefits under the Law for the Encouragement of Industry (Taxes), 1969

According to the Law for the Encouragement of Industry (Taxes), 1969, generally referred to as the Industry Encouragement Law, an industrial company is a company incorporated and resident in Israel, at least 90% of the income of which, in a given tax year, determined in Israeli currency exclusive of income from specified government loans, capital gains, interest and dividends, is derived from an industrial enterprise owned by it. An industrial enterprise is defined as an enterprise whose major activity in a given tax year is industrial production activity.

Under the Industry Encouragement Law, industrial companies are entitled to the following preferred corporate tax benefits, among others:

- deduction of purchases of know-how, patents and the right to use a patent over an eight-year period for tax purposes;
  - deduction over a three-year period of specified expenses incurred with the issuance and listing of shares on the Tel Aviv Stock Exchange or on a recognized stock exchange outside of Israel (including Nasdaq);
- the right to elect, under specified conditions, to file a consolidated tax return with additional related Israeli industrial companies; and

accelerated depreciation rates on equipment and buildings.

Eligibility for benefits under the Industry Encouragement Law is not subject to receipt of prior approval from any governmental authority.

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We believe that we currently qualify as an industrial company within the definition of the Industry Encouragement Law. We cannot assure you that we will continue to qualify as an industrial company or that the benefits described above will be available to us in the future.

#### Special Provisions Relating to Taxation under Inflationary Conditions

Under the Income Tax (Inflationary Adjustments) Law, 1985, results for tax purposes were measured in real terms in accordance with the changes in the Israeli Consumer Price Index (“Israeli CPI”). Accordingly, until 2002, results for tax purposes were measured in terms of earnings in NIS after certain adjustments for increases in the Israeli CPI. Commencing in fiscal year 2003, we have elected to measure our taxable income and file our tax return under the Israeli Income Tax Regulations (Principles Regarding the Management of Books of Account of Foreign Invested Companies and Certain Partnerships and the Determination of Their Taxable Income), 1986. Accordingly, commencing with fiscal year 2003, results for tax purposes are measured in terms of earnings in US dollars. Since 2006, we file for extensions on an annual basis. Beginning January 1, 2008, the Inflationary Adjustments Law was repealed.

#### Israeli Capital Gains Tax on Sales of Shares

Israeli law imposes a capital gains tax on the sale of any capital assets by residents of Israel, as defined for Israeli tax purposes, and on the sale of assets located in Israel, including shares in Israeli companies, by non-residents of Israel, unless a specific exemption is available or unless a tax treaty between Israel and the shareholder’s country of residence provides otherwise. The law distinguishes between real gain and inflationary surplus. The inflationary surplus is a portion of the total capital gain that is equivalent to the increase of the relevant asset’s purchase price which is attributable to the increase in the Israeli consumer price index or, in certain circumstances, a foreign currency exchange rate, between the date of purchase and the date of sale. The real gain is the excess of the total capital gain over the inflationary surplus.

Generally, the tax rate applicable to capital gains derived from the sale of shares, whether listed on a stock market or not, is 25% for Israeli individuals. Additionally, if such individual shareholder is considered a “significant shareholder” at any time during the 12-month period preceding such sale (i.e. such shareholder holds directly or indirectly, including jointly with others, at least 10% of any means of control in the company) the tax rate is 30%. Israeli companies are subject to the corporate tax rate on capital gains derived from the sale of publicly-traded shares.

Capital gains accrued on the sale of an asset purchased prior to January 1, 2003 will be subject to tax at a blended rate. The marginal tax rate for individuals (47% in 2017) will be applied to the portion of the gain amount which bears the same ratio to the total gain realized as the ratio which the holding period commencing at the acquisition date and terminating on January 1, 2003 bears to the total holding period. The remainder of the gain realized will be subject to capital gains tax at the rates applicable to an asset purchased after January 1, 2003 (see the above).

Furthermore, beginning on January 1, 2013, an additional tax liability at the rate of 2% was added to the applicable tax rate on the annual taxable income of the individuals (whether any such individual is an Israeli resident or non-Israeli resident) exceeding NIS 803,520 (in 2016) (hereinafter: “Added Tax”). Effective January 1, 2017 the Added Tax rate has increased to 3% and the threshold taxable income was reduced to NIS 640,000.

Generally, non-Israeli residents are exempt from Israeli capital gains tax on any gains derived from the sale of shares publicly traded on a recognized stock market outside of Israel (including Nasdaq). However, non-Israeli corporations will not be entitled to such exemption if an Israeli resident (i) has a controlling interest of 25% or more in such non-Israeli corporation, or (ii) is the beneficiary of or is entitled to 25% or more of the revenues or profits of such non-Israeli corporation, whether directly or indirectly. Such exemption is not applicable to a person whose gains from selling or otherwise disposing of the shares are deemed to be business income.

In some instances where our shareholders may be liable to Israeli tax on the sale of their ordinary shares, the payment of the consideration may be subject to the withholding of Israeli tax at the source.

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Under the convention between the United States and Israel concerning taxes on income, as amended (the “U.S.-Israel Tax Treaty”), generally, Israeli capital gains tax will not apply to the sale, exchange or disposition of ordinary shares by a person who:

holds the ordinary shares as a capital asset;

qualifies as a resident of the United States within the meaning of the U.S.-Israel tax treaty; and

is entitled to claim the benefits available to the person by the U.S.-Israel tax treaty.

However, this exemption will not apply if (i) the treaty U.S. resident holds, directly or indirectly, shares representing 10% or more of our voting power during any part of the 12-month period preceding the sale, exchange or disposition, subject to specified conditions, or (ii) the capital gains from such sale, exchange or disposition can be allocated to a permanent establishment in Israel. In this case, the sale, exchange or disposition would be subject to Israeli tax, to the extent applicable. However, under the U.S.-Israel tax treaty, the treaty U.S. resident would be permitted to claim a credit for the taxes against the U.S. federal income tax imposed on the sale, exchange or disposition, subject to the limitations in U.S. laws applicable to foreign tax credits. The U.S.-Israel tax treaty does not relate to U.S. state or local taxes.

#### Israeli Taxation of Dividends Distributed to Non-Resident Holders of Our Shares

Non-residents of Israel are subject to income tax on income accrued or derived from sources in Israel. These sources of income include passive income, including dividends, royalties and interest, as well as non-passive income from services provided in Israel. On distributions of dividends other than bonus shares or stock dividends, income tax is withheld at source at the following rates: 25% or 30% for a shareholder that is considered a significant shareholder at any time during the 12-month period preceding such distribution; unless a different rate is provided in a treaty between Israel and the shareholder’s country of residence. According to the U.S.-Israel Tax Treaty, the tax withholding rate on dividends distributed by an Israeli corporation to a U.S. individual and a U.S. corporation is 25%. If the U.S. company holds 10% or more of the voting power of the Israeli company during the part of the tax year which precedes the date of payment of the dividend and during the whole of the preceding tax year, the tax withholding rate is reduced to 12.5%. Dividends received by the U.S. company or the U.S. individual distributed from income generated by an approved enterprise and beneficiary enterprise are subject to withholding tax at a rate of 15%.

#### Israeli Transfer Pricing Regulations

On November 29, 2006, Income Tax Regulations (Determination of Market Terms), 2006, promulgated under Section 85A of the Tax Ordinance, came into effect (the “TP Regs”). Section 85A of the Tax Ordinance and the TP Regulations generally requires that all cross-border transactions carried out between related parties be conducted on an arm’s length principle basis and will be taxed accordingly. The TP Regulations have not had a material effect on the Company.

#### U.S. Federal Income Tax Considerations

Subject to the limitations described below, the following discussion summarizes certain U.S. federal income tax consequences of the purchase, ownership and disposition of our ordinary shares to a U.S. holder that owns our ordinary shares as a capital asset (generally, for investment). A U.S. holder is a holder of our ordinary shares that is for U.S. federal income tax purposes:

an individual citizen or resident of the United States;

a corporation (or other entity taxable as a corporation for U.S. federal income tax purposes) created or organized in the United States or under the laws of the United States, any political subdivision thereof or the District of Columbia;

an estate, the income of which is subject to U.S. federal income tax regardless of its source; or

a trust (i) if a court within the United States is able to exercise primary supervision over its administration and one or more U.S. persons have the authority to control all of its substantial decisions or (ii) that has in effect a valid election under applicable U.S. Treasury Regulations to be treated as a U.S. person.

If a partnership (or any other entity treated as a partnership for U.S. federal income tax purposes) holds our ordinary shares, the tax treatment of the entity and an equity owner in such entity will generally depend on the status of the equity owner and the activities of the entity. Such an equity owner or entity should consult its own tax advisor as to its tax consequences.



Certain aspects of U.S. federal income taxes relevant to a holder of our ordinary shares (other than a partnership) that is not a U.S. holder (a “Non-U.S. holder”) are also discussed below.

This discussion is based on current provisions of the Internal Revenue Code of 1986, as amended (the “Code”), current and proposed Treasury Regulations, and administrative and judicial decisions as of the date of this annual report, all of which are subject to change, possibly on a retroactive basis. This discussion does not address all aspects of U.S. federal income taxation that may be relevant to any particular U.S. holder in light of such holder’s individual circumstances. In particular, this discussion does not address the potential application of the U.S. federal income tax consequences to U.S. holders that are subject to special treatment, including U.S. holders that:

- are broker-dealers or insurance companies;
- have elected mark-to-market accounting;
- are tax-exempt organizations or retirement plans;
- are grantor trusts;
- are S corporations;
- are certain former citizens or long-term residents of the United States;
- are financial institutions;
- hold ordinary shares as part of a straddle, hedge or conversion transaction with other investments;
- acquired their ordinary shares upon the exercise of employee stock options or otherwise as compensation;
- are real estate investment trusts or regulated investment companies;
- own directly, indirectly or by attribution at least 10% of our shares (by vote or value); or
- have a functional currency that is not the U.S. dollar.

This discussion is not a comprehensive description of all of the tax considerations that may be relevant to each person’s decision to purchase our ordinary shares. For example, this discussion does not address any aspect of state, local or non-U.S. tax laws, the possible application of the alternative minimum tax or United States federal gift or estate taxes.

Each holder of our ordinary shares is advised to consult his or her own tax advisor with respect to the specific tax consequences to him or her of purchasing, owning or disposing of our ordinary shares, including the applicability and effect of federal, state, local and foreign income and other tax laws to his or her particular circumstances.

#### Taxation of Distributions Paid on Ordinary Shares

Subject to the discussion below under “Tax Consequences if We Are a Passive Foreign Investment Company,” a U.S. holder will be required to include in gross income as dividend income the amount of any distribution paid on our ordinary shares, including any non-U.S. taxes withheld from the amount paid, to the extent the distribution is paid out of our current or accumulated earnings and profits as determined for U.S. federal income tax purposes. Distributions in excess of earnings and profits will be applied against and will reduce the U.S. holder’s tax basis in its ordinary shares and, to the extent in excess of that basis, will be treated as gain from the sale or exchange of ordinary shares. The dividend portion of such distribution generally will not qualify for the dividends received deduction otherwise

available to corporations.

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Dividends that are received by U.S. holders that are individuals, estates or trusts will be taxed at the rate applicable to long-term capital gains (currently a maximum rate of 20%), provided that such dividends meet the requirements of “qualified dividend income.” Subject to the holding period and risk-of-loss requirements discussed below generally, dividends paid by a non-U.S. corporation that is not a passive foreign investment company (as discussed below) will generally be qualified dividend income if either the stock with respect to which the dividend is paid is readily tradable on an established securities market in the United States (such as the Nasdaq Global Select Market) or such corporation is eligible for the benefits of an income tax treaty with the IRS determines is satisfactory and which includes an exchange of information program. The IRS has determined that the U.S.-Israel income tax treaty is satisfactory for this purpose and includes an exchange of information program. Dividends that fail to meet such requirements, and dividends received by corporate U.S. holders, are taxed at ordinary income rates. No dividend received by a U.S. holder will be a qualified dividend if (1) the U.S. holder held the ordinary share with respect to which the dividend was paid for less than 61 days during the 121-day period beginning on the date that is 60 days before the ex-dividend date with respect to such dividend, excluding for this purpose, under the rules of Code Section 246(c), any period during which the U.S. holder has an option to sell, is under a contractual obligation to sell, has made and not closed a short sale of, is the grantor of a deep-in-the-money or otherwise nonqualified option to buy, or has otherwise diminished its risk of loss by holding other positions with respect to, such ordinary share (or substantially identical securities) or (2) the U.S. holder is under an obligation (pursuant to a short sale or otherwise) to make related payments with respect to positions in property substantially similar or related to the ordinary share with respect to which the dividend is paid. If we were to be PFIC (as such term is defined in the Code) for any year, dividends paid on our ordinary shares in such year or in the following year would not be qualified dividends. In addition, a non-corporate U.S. holder will be able to take a qualified dividend into account in determining its deductible investment interest (which is generally limited to its net investment income) only if it elects to do so; in such case the dividend will be taxed at ordinary income tax rates.

Distributions of current or accumulated earnings and profits paid in foreign currency to a U.S. holder (including any non-U.S. taxes withheld from the distributions) will generally be includible in the income of a U.S. holder in a dollar amount calculated by reference to the exchange rate on the date of the distribution. A U.S. holder that receives a foreign currency distribution and converts the foreign currency into dollars after the date of distribution may have foreign exchange gain or loss based on any appreciation or depreciation in the value of the foreign currency against the dollar, which will generally be U.S. source ordinary income or loss.

U.S. holders generally will have the option of claiming the amount of any non-U.S. income taxes withheld at source either as a deduction from gross income or as a dollar-for-dollar credit against their U.S. federal income tax liability. Individuals who do not claim itemized deductions, but instead utilize the standard deduction, may not claim a deduction for the amount of the non-U.S. income taxes withheld, but the amount may be claimed as a credit against the individual’s U.S. federal income tax liability. The amount of non-U.S. income taxes that may be claimed as a credit in any year is subject to complex limitations and restrictions, which must be determined on an individual basis by each holder. These limitations include rules which limit foreign tax credits allowable for specific classes of income to the U.S. federal income taxes otherwise payable on each such class of income. The total amount of allowable foreign tax credits in any year generally cannot exceed the pre-credit U.S. tax liability for the year attributable to non-U.S. source taxable income. Distributions of current or accumulated earnings and profits generally will be non-U.S. source passive income for U.S. foreign tax credit purposes.

A U.S. holder will be denied a foreign tax credit for non-U.S. income taxes withheld from a dividend received on the ordinary shares (1) if the U.S. holder has not held the ordinary shares for at least 16 days of the 31-day period beginning on the date which is 15 days before the ex-dividend date with respect to such dividend or (2) to the extent the U.S. holder is under an obligation to make related payments with respect to positions in substantially similar or related property. Any days during which a U.S. holder has substantially diminished its risk of loss on the ordinary shares are not counted toward meeting the required 16-day holding period.

Taxation of the Disposition of Ordinary Shares

Subject to the discussion below under “Tax Consequences if We Are a Passive Foreign Investment Company,” upon the sale, exchange or other disposition of our ordinary shares (other than in certain non-recognition transactions), a U.S. holder will recognize capital gain or loss in an amount equal to the difference between the U.S. holder’s basis in the ordinary shares, which is usually the cost to the U.S. holder of the ordinary shares, and the amount realized on the disposition. Capital gain from the sale, exchange or other disposition of ordinary shares held more than one year will be long-term capital gain and may, in the case of non-corporate U.S. holders, be subject to a reduced rate of taxation (long-term capital gains are currently taxable at a maximum rate of 20% for U.S. holders that are individuals, estates or trusts). Gain or loss recognized by a U.S. holder on a sale, exchange or other disposition of ordinary shares will generally be treated as U.S. source income for U.S. foreign tax credit purposes. The deductibility of a capital loss recognized on the sale, exchange or other disposition of ordinary shares may be subject to limitations.

A U.S. holder that uses the cash method of accounting calculates the dollar value of the proceeds received on the sale as of the date that the sale settles. However, a U.S. holder that uses the accrual method of accounting is required to calculate the value of the proceeds of the sale as of the trade date and may therefore realize foreign currency gain or loss. An accrual method U.S. holder may avoid realizing such foreign currency gain or loss by electing to use the settlement date to determine the proceeds of sale for purposes of calculating the foreign currency gain or loss. In addition, a U.S. holder that receives foreign currency upon disposition of ordinary shares and converts the foreign currency into dollars after the settlement date or trade date (whichever date the U.S. holder is required to use to calculate the value of the proceeds of sale) may have foreign exchange gain or loss based on any appreciation or depreciation in the value of the foreign currency against the dollar, which will generally be U.S. source ordinary income or loss.

#### Net Investment Income Tax

Certain non-corporate U.S. holders may also be subject to an additional 3.8% tax on all or a portion of their “net investment income,” which may include dividends on, or capital gains recognized from the disposition of, our ordinary shares, subject to certain limitations and exceptions. U.S. holders are urged to consult their own tax advisors regarding the implications of the Net Investment income tax on their investment in our ordinary shares.

#### Tax Consequences if We Are a Passive Foreign Investment Company

For U.S. federal income tax purposes, we will be classified as a passive foreign investment company, or PFIC, for any taxable year in which, after applying certain look-through rules, either (i) 75% or more of our gross income is passive income or (ii) at least 50% of the average value of our total assets (determined on a quarterly basis) for the taxable year produce, or are held for the production of, passive income. For this purpose, cash is considered to be an asset which produces passive income. Passive income includes dividends, interest, royalties, rents, annuities and the excess of gains over losses from the disposition of certain assets which produce passive income.

Based on our income, assets, activities and market capitalization, we do not believe that we were a PFIC for the taxable year ended December 31, 2018. However, there can be no assurances that the IRS will not challenge this conclusion. If we were not a PFIC for 2018, U.S. holders who acquired our ordinary shares in 2018 will not be subject to the PFIC rules described below (regardless of whether we were a PFIC in any prior year) unless we are classified as a PFIC in future years. The tests for determining PFIC status are applied annually and it is difficult to make accurate predictions of our future income, assets, activities and market capitalization, including fluctuations in the price of our ordinary shares, which are relevant to this determination.

If we are a PFIC, a U.S. holder of our ordinary shares could be subject to increased tax liability upon the sale or other disposition (including gain deemed recognized if the ordinary shares are used as security for a loan) of its ordinary shares or upon the receipt of distributions that are treated as “excess distributions”, which could result in a reduction in the after-tax return to such U.S. holder. In general, an excess distribution is the amount of distributions received during a taxable year that exceed 125% of the average amount of distributions received by a U.S. holder in respect of the ordinary shares during the preceding three taxable years, or if shorter, during the U.S. holder’s holding period prior to the taxable year of the distribution. Under these rules, the distributions that are excess distributions and any gain on the disposition of ordinary shares would be allocated ratably over the U.S. holder’s holding period for the ordinary shares. The amount allocated to the current taxable year and any taxable year prior to the first taxable year in which we were a PFIC would be taxed as ordinary income. The amount allocated to each of the other taxable years would be subject to tax at the highest marginal rate in effect for the applicable class of taxpayer for that taxable year, and an interest charge for the deemed deferral benefit would be imposed on the resulting tax allocated to such other taxable years. The tax liability with respect to the amount allocated to taxable years prior to the year of the disposition or distribution cannot be offset by net operating losses. In addition, holders of stock in a PFIC may not receive a “step-up” in basis on shares acquired from a decedent. Furthermore, if we are a PFIC, each U.S. holder generally will be required to file an annual report with the IRS.



As an alternative to the tax treatment described above, a U.S. holder could elect to treat us as a “qualified electing fund” (“QEF”), in which case the U.S. holder would be required to include in income, for each taxable year that we are a PFIC, its pro rata share of our ordinary earnings as ordinary income and its pro rata share of our net capital gains as capital gain, subject to a separate election to defer payment of taxes where such deferral is subject to an interest charge. We may supply U.S. holders that make a request in writing with the information needed to report income and gain under a QEF election, if we are a PFIC. Any income inclusion will be required whether or not such U.S. holder owns our ordinary shares for an entire taxable year or at the end of our taxable year. The amount so includible will be determined without regard to our prior year losses or the amount of cash distributions, if any, received from us. Special rules apply if a U.S. holder makes a QEF election after the first year in its holding period in which we are a PFIC. A U.S. holder’s basis in its ordinary shares will increase by any amount included in income and decrease by any amounts distributed to the extent such amounts were previously taxed under the QEF rules. So long as a U.S. holder’s QEF election is in effect beginning with the first taxable year in its holding period in which we were a PFIC, any gain or loss realized by such holder on the disposition of its ordinary shares held as a capital asset ordinarily would be capital gain or loss. Such capital gain or loss ordinarily would be long-term if such U.S. holder had held such ordinary shares for more than one year at the time of the disposition. The QEF election is made on a shareholder-by-shareholder basis, applies to all ordinary shares held or subsequently acquired by an electing U.S. holder and can be revoked only with the consent of the IRS.

As an alternative to making a QEF election, a U.S. holder of PFIC stock which is “marketable stock” (e.g., “regularly traded” on the Nasdaq Global Select Market) may in certain circumstances avoid certain of the tax consequences generally applicable to holders of stock in a PFIC by electing to mark the stock to market as of the beginning of such U.S. holder’s holding period for the ordinary shares. As a result of such election, in any taxable year that we are a PFIC, a U.S. holder generally would be required to report gain or loss to the extent of the difference between the fair market value of the ordinary shares at the end of the taxable year and such U.S. holder’s tax basis in its ordinary shares at that time. Any gain under this computation, and any gain on an actual disposition of the ordinary shares in a year in which we are a PFIC, would be treated as ordinary income. Any loss under this computation, and any loss on an actual disposition of the ordinary shares in a year in which we are a PFIC, generally would be treated as ordinary loss to the extent of the cumulative net-mark-to-market gain previously included. Any remaining loss from marking ordinary shares to market will not be allowed, and any remaining loss from an actual disposition of ordinary shares generally would be capital loss. A U.S. holder’s tax basis in its ordinary shares is adjusted annually for any gain or loss recognized under the mark-to-market election. There can be no assurances that there will be sufficient trading volume with respect to the ordinary shares in order for the ordinary shares to be considered “regularly traded” or that our ordinary shares will continue to trade on the Nasdaq Global Select Market. Accordingly, there are no assurances that the ordinary shares will be marketable stock for these purposes. As with a QEF election, a mark-to-market election is made on a shareholder-by-shareholder basis, applies to all ordinary shares held or subsequently acquired by an electing U.S. holder and can only be revoked with consent of the IRS (except to the extent the ordinary shares no longer constitute “marketable stock”).

The U.S. federal income tax consequences to a U.S. holder if we were to be classified as a PFIC in 2018 or any previous taxable year are complex. A U.S. holder should consult with his or her own advisor with regard to those consequences, as well as with regard to whether he or she should make either of the elections described above.

#### Tax Consequences for Non-U.S. Holders of Ordinary Shares

Except as described in “Information Reporting and Back-up Withholding” below, a non-U.S. holder of our ordinary shares will not be subject to U.S. federal income or withholding tax on the payment of dividends on, and the proceeds from the disposition of, our ordinary shares, unless, in the case of U.S. federal income taxes:

the item is effectively connected with the conduct by the non-U.S. holder of a trade or business in the United States and in the case of a resident of a country which has a treaty with the United States, the item is attributable to a permanent establishment, or in the case of an individual, the item is attributable to a fixed place of business in the

United States; or

the non-U.S. holder is an individual who holds the ordinary shares as a capital asset and is present in the United States for 183 days or more in the taxable year of the disposition, and certain other conditions are met.

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## Information Reporting and Back-up Withholding

U.S. holders generally are subject to information reporting requirements with respect to dividends on, or proceeds from the disposition of, our ordinary shares. In addition, a U.S. holder may be subject, under certain circumstances, to backup withholding with respect to dividends paid on, or proceeds from the disposition of, our ordinary shares unless the U.S. holder provides proof of an applicable exemption or correct taxpayer identification number, and otherwise complies with the applicable requirements of the backup withholding rules. A U.S. holder of our ordinary shares who provides an incorrect taxpayer identification number may be subject to penalties imposed by the IRS. Amounts withheld under the backup withholding rules are not an additional tax and may be refunded or credited against the U.S. holder's U.S. federal income tax liability, provided the required information is timely furnished to the IRS.

Non-U.S. holders generally are not subject to information reporting or back-up withholding with respect to dividends paid in the United States on, or proceeds from the disposition of, our ordinary shares, provided that the non-U.S. holder provides a taxpayer identification number, certifies to its foreign status, or establishes another exemption from the information reporting or back-up withholding requirements.

Certain U.S. holders (and to the extent provided in IRS guidance, certain non-U.S. holders) who hold interests in "specified foreign financial assets" (as defined in Section 6038D of the Code) are generally required to file an IRS Form 8938 as part of their U.S. federal income tax returns to report their ownership of such specified foreign financial assets, which may include our ordinary shares, if the total value of those assets exceed certain thresholds. Substantial penalties may apply to any failure to timely file IRS Form 8938. In addition, in the event a holder that is required to file IRS Form 8938 does not file such form, the statute of limitations on the assessment and collection of U.S. federal income taxes of such holder for the related tax year may not close until three years after the date that the required information is filed. Holders should consult their own tax advisors regarding their tax reporting obligations.

## Documents on Display

We are subject to the informational requirements of the Securities Exchange Act of 1934, as amended, applicable to foreign private issuers and fulfill these requirements by filing reports with the SEC. These reports include certain financial and statistical information about us, and may be accompanied by exhibits.

The SEC maintains an Internet website at <http://www.sec.gov> that contains reports, proxy statements, information statements and other information regarding issuers that file electronically with the SEC filed through the SEC's Electronic Data Gathering, Analysis and Retrieval (EDGAR) system.

You may also visit us on the Internet at [www.ceragon.com](http://www.ceragon.com). However, information contained on our website does not constitute a part of this annual report.

## ITEM 11. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK.

We do not use derivative financial instruments for trading purposes. Accordingly, we have concluded that there is no material market risk exposure of the type contemplated by Item 11, and that no quantitative tabular disclosures are required. We are exposed to certain other types of market risks, as described below.

### Foreign Currency Risk

As the majority of our revenues and cost of revenues, as well as a significant portion of our operating expenses, are in U.S. dollars, we have determined that our functional currency is the U.S. dollar. However, a significant portion of our revenues, costs of revenue as well as a major portion of our operating expenses are denominated in other currencies, mainly in NIS, INR, EUR, BRL, ARS and NOK. As our financial results are reported in U.S. dollars, fluctuations in the exchange rates between the U.S. dollar and applicable non-dollar currencies may have an effect on our results of

operations. In order to reduce such effect, we hedge a portion of certain cash flow transactions denominated in non-dollar currencies as well as a portion of certain monetary items in the balance sheet, such as trade receivables and trade payables, denominated in non-dollar currencies. The following sensitivity analysis illustrates the impact on our non-dollar net monetary assets assuming an instantaneous 10% change in foreign currency exchange rates from year-end levels, with all other variables held constant. At December 31, 2018, a 10% strengthening of the U.S. dollar versus other currencies would have resulted in an increase of approximately \$0.7 million in our net monetary assets position, while a 10% weakening of the dollar versus all other currencies would have resulted in a decrease of approximately \$0.8 million in our net monetary assets position.

The counter-parties to our hedging transactions are major financial institutions with high credit ratings. As of December 31, 2018, we had outstanding forward like contracts in the amount of \$59.3 million for a period of up to twelve months.

We do not invest in interest rate derivative financial instruments.

ITEM 12. DESCRIPTION OF SECURITIES OTHER THAN EQUITY SECURITIES.

Not applicable.

PART II

ITEM 13. DEFAULTS, DIVIDEND ARREARAGES AND DELINQUENCIES.

None.

ITEM 14. MATERIAL MODIFICATIONS TO THE RIGHTS OF SECURITY HOLDERS AND USE OF PROCEEDS.

None

ITEM 15. CONTROLS AND PROCEDURES

(a) Disclosure Controls and Procedures

The Company performed an evaluation of the effectiveness of its disclosure controls and procedures that are designed to provide reasonable assurance that the material financial and non-financial information required to be disclosed to the SEC is recorded, processed, summarized and reported timely. Based on the Company's evaluation, the Company's management, including the CEO and CFO, has concluded that the Company's disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) of the Securities Exchange Act of 1934, as amended) as of the end of the period covered by this report are effective in reaching such reasonable assurance. Notwithstanding the foregoing, there can be no assurance that the Company's disclosure controls and procedures will detect or uncover all failures of persons within the Company to disclose material information otherwise required to be set forth in the Company's reports.

(b) Management's Annual Report on Internal Control Over Financial Reporting

The Company's management is responsible for establishing and maintaining adequate internal control over financial reporting for the Company.

The Company performed an evaluation of the effectiveness of its internal control over financial reporting that is designed by, or under the supervision of, the Company's principal executive and principal financial officers, and effected by the Company's Board of Directors, management and other personnel, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles and includes those policies and procedures that:

- (i) Pertain to the maintenance of records that in reasonable detail accurately and fairly reflect the transactions and dispositions of the assets of the Company;
- (ii) Provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the

Company are being made only in accordance with authorizations of management and directors of the Company;  
and

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- (iii) Provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of the Company's assets that could have a material effect on the financial statements.

Under the supervision and with the participation of our management, including our CEO and CFO, we conducted an evaluation of the effectiveness of our internal control over financial reporting as of December 31, 2018 based on the framework for Internal Control - Integrated Framework set forth by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) (COSO). Based on our assessment under that framework and the criteria established therein, our management concluded that the Company's internal control over financial reporting was effective as of December 31, 2018 in providing reasonable assurance regarding the reliability of the Company's financial reporting. Notwithstanding the foregoing, there can be no assurance that the Company's financial reporting controls and procedures will detect or uncover all failures of persons within the Company to do all the required activities properly, which may impact the fair presentation of the financial statements of the Company otherwise required to be set forth in the financial reports.

(c) Attestation Report of Independent Registered Public Accounting Firm

Kost, Forer, Gabbay & Kasierer, a Member of Ernst & Young Global, our independent registered public accounting firm, has issued an attestation report on the effectiveness of our internal control over financial reporting, appearing under Item 18: "FINANCIAL STATEMENTS" on pages F-3 – F-4, and such report is incorporated herein by reference.

(d) Changes in Internal Controls Over Financial Reporting

There were no changes in the Company's internal control over financial reporting that occurred during the year ended December 31, 2018 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

ITEM 16A. AUDIT COMMITTEE FINANCIAL EXPERT

The Company's Board of Directors has determined that Mr. Shlomo Liran is the audit committee financial expert. Mr. Liran is an independent director under the Nasdaq Rules.

ITEM 16B. CODE OF ETHICS

In November 2003, the Company's Board of Directors adopted a Code of Ethics that applies to the CEO, chief financial officer and controller. In October 2008, we amended our Code of Ethics in order to update it and expand its applicability to additional senior officers. In December 2009, we combined the Code of Ethics together with certain Standards of Business Conduct to strengthen the Company's Ethics Compliance Program. In October 2014, and again in December 2016, we amended and expanded the Company's Ethics Compliance Program, in order to strengthen certain provisions thereunder. A copy of the Company's updated Code of Ethics may be obtained, without charge, upon a written request addressed to the Company's investor relations department, 24 Raoul Wallenberg Street, Tel Aviv 69719, Israel (Telephone no. +972-3-645-5733) (e-mail: ir@ceragon.com). In addition, it is also available on the Internet at [www.ceragon.com](http://www.ceragon.com). However, information contained on our website does not constitute a part of this annual report.

## ITEM 16C. PRINCIPAL ACCOUNTANT FEES AND SERVICES

## Fees Paid to Independent Auditors

The following table sets forth, for each of the years indicated, the fees billed by Kost, Forer, Gabbay & Kasierer, a member firm of Ernst & Young Global, our auditors, and the percentage of each of the fees out of the total amount billed by them.

Services Rendered	Year Ended December 31,		2018		
	2017	Percentages	Fees	Percentages	
Audit Fees <sup>(1)</sup>	\$795,615	73	% \$678,000	83	%
Tax Fees <sup>(2)</sup>	\$187,303	17	% \$117,500	14	%
Other Services <sup>(3)</sup>	\$112,000	10	% \$22,000	3	%
Total	\$1,094,918	100	% \$817,500	100	%

(1) Audit fees consist of services that would normally be provided in connection with statutory and regulatory filings or engagements, including services that generally only the independent accountant can reasonably provide.

(2) Tax fees relate to tax compliance, planning and advice

(3) Other consulting services

## Policies and Procedures

Our Financial Audit Committee is in charge of a policy and procedures for approval of audit and non-audit services rendered by our independent auditors. The policy requires the Financial Audit Committee's approval of the scope of the engagement of our independent auditor. The policy prohibits retention of the independent auditors to perform the prohibited non-audit functions defined in Section 201 of the Sarbanes-Oxley Act of 2002 or the rules of the SEC, and also considers whether proposed services are compatible with the independence of the public auditors.

All of the fees listed in the table above were approved by our Financial Audit Committee.

## ITEM 16D. EXEMPTIONS FROM THE LISTING STANDARDS FOR AUDIT COMMITTEES

None.

## ITEM 16E. PURCHASES OF EQUITY SECURITIES BY THE ISSUER AND AFFILIATED PURCHASERS

There were no purchases of our ordinary shares by affiliates during the year ended December 31, 2018.

## ITEM 16F. CHANGE IN REGISTRANT'S CERTIFYING ACCOUNTANT

Not applicable.

## ITEM 16G. CORPORATE GOVERNANCE

The Nasdaq Rules provide that foreign private issuers may follow home country practice in lieu of certain Nasdaq rules, subject to certain exceptions and except to the extent that such exemptions would not be contrary to U.S. federal securities laws, so long as the foreign private issuer: (i) provides a written statement from an independent counsel in its home country certifying that the company's practices are not prohibited by the home country law; and (ii) discloses that it does not follow such listing requirement and describes the home country practice followed in its reports filed

with the SEC. The practices we currently follow in lieu of Nasdaq Rules are described below:

Compensation Committee Charter: We have opted out of the requirement to adopt and file a compensation committee charter as set forth in Nasdaq Rule 5605(d)(1). Instead, our Compensation Committee conducts itself in accordance with provisions governing the establishment and the responsibilities of a compensation committee as set forth in the Companies Law.

Shareholder Approval: We have opted out of the requirement for shareholder approval of stock option plans and other equity-based compensation arrangements as set forth in Nasdaq Rule 5635. Nevertheless, as required under the Companies Law, shareholder voting procedures are followed for the approval of equity-based compensation of certain office holders or employees, such as our CEO and members of our Board of Directors. Equity based compensation arrangements with other office holders are approved by our Compensation Committee and our Board of Directors, provided they are consistent with our Compensation Policy, and in special circumstances in deviation therefrom, taking into account certain considerations as set forth in the Companies Law.

Annual General Meetings of Shareholders: We have opted out of the requirement for conducting annual meetings as set forth in Nasdaq Rule 5620(a), which requires Ceragon to hold its annual meetings of shareholders within twelve months of the end of its fiscal year end. Instead, Ceragon is following home country practice and law in this respect. The Companies Law requires that an annual meeting of shareholders be held every year, and not later than 15 months following the last annual meeting (see in Item 10.B above –"Additional Information –Voting, Shareholders' Meetings and Resolutions").

Quorum at General Meetings of Shareholders: We have opted out of the requirement set under Rule 5620(c) of the Nasdaq Rules, which requires the presence of two or more shareholders holding at least 33 1/3%, and in lieu follow our home country practice and Israeli law, according to which the quorum for any shareholders meeting will be the presence of two or more shareholders holding at least 25% of the voting rights in the aggregate - within half an hour from the time set for opening the meeting.

Distribution of Annual Reports: We have chosen to follow our home country practice in lieu of the requirements of Nasdaq Rule 5250(d)(1), relating to an issuer's furnishing of its annual report to shareholders. Specifically, we file annual reports on Form 20-F, which contain financial statements audited by an independent accounting firm, electronically with the SEC, and also post a copy on our website.

#### ITEM 16H. MINE SAFETY DISCLOSURE

Not Applicable.

#### PART III

#### ITEM 17. FINANCIAL STATEMENTS

Not applicable.

#### ITEM 18. FINANCIAL STATEMENTS

The Consolidated Financial Statements and related notes thereto required by this item are contained on pages F-2 through F-47 hereof.

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ITEM 19. EXHIBITS

1.2 Articles of Association, as amended September 20, 2016<sup>(1)</sup>

4.4 HSBC Bank Plc, Bank Leumi Le’Israel Ltd. and First International Bank of Israel Ltd. (English summary of the material terms)<sup>(2)</sup>

4.5 Amendment, effective as of October 1, 2013, to the Credit Facility (English summary of the material terms)<sup>(3)</sup>

4.6 Amendment No. 2, effective as of April 29, 2014, to the Credit Facility (English summary of the material terms)<sup>(4)</sup>

4.7 Amendment No. 3, effective as of March 31, 2015, to the Credit Facility (English summary of the material terms)<sup>(4)</sup>

4.8 Amended and Restated Share Option and RSU Plan, as amended August 10, 2014<sup>(4)</sup>

4.9 Amendment No. 4, effective as of March 10, 2016, to the Credit Facility (English summary of the material terms)<sup>(5)</sup>

4.10 Amendment No. 5, executed in December 2016, to the Credit Facility (English summary of the material terms)<sup>(6)</sup>

4.11 Amendment No. 6, effective as of March 30, 2017, to the Credit Facility (English summary of the material terms)<sup>(7)</sup>

4.12 Amendment No. 7, executed on February 12, 2018, to the Credit Facility (English summary of the material terms)<sup>(8)</sup>

4.13 Amendment No. 8, executed on March 26, 2018, to the Credit Facility (English summary of the material terms)<sup>(8)</sup>

8.1 List of Significant Subsidiaries

10.1 Consent of Independent Registered Public Accounting Firm

10.2 Consent of Independent Registered Public Accounting Firm

12.1 Certification by CEO pursuant to Section 302 of the Sarbanes-Oxley Act of 2002

12.2 Certification by Chief Financial Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002

13.1 Certification pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002

The following financial information from Ceragon Networks Ltd.’s Annual Report on Form 20-F for the year ended December 31, 2018, formatted in XBRL (Extensible Business Reporting Language): (i) Consolidated Statements of Operations for the years ended December 31, 2018, 2017 and 2016; (ii) Consolidated Statements of Comprehensive Income (Loss) at December 31, 2018, 2017 and 2016; (iii) Consolidated Statements of Changes in Shareholders’ Equity for the years ended December 31, 2018, 2017 and 2016; (iv) Consolidated Statements of Cash Flows for the years ended December 31, 2018, 2017 and 2016; and (v) Notes to Consolidated Financial Statements. Users of this data are advised, in accordance with Rule 406T of Regulation S-T promulgated by the SEC, that this Interactive Data File is deemed not filed or part of a registration statement or prospectus for purposes of Sections 11 or 12 of the Securities Act of 1933, is deemed not filed for purposes of Section 18 of the Exchange Act, and otherwise is not subject to liability under these sections.

(1) Previously filed as exhibit 1.2 to the Company’s Annual Report on Form 20-F for the year ended December 31, 2016 and incorporated herein by reference.

(2) Previously filed as exhibit 4.4 to the Company’s Annual Report on Form 20-F for the year ended December 31, 2012 and incorporated herein by reference.

(3) Previously furnished as exhibit 99.3 in a Report on Form 6-K which exhibit was incorporated by reference into the Company’s Registration Statement on Form F-3 (No. 333-183316), and incorporated herein by reference.

(4) Previously filed as exhibits 4.6, 4.7 and 4.8 to the Company’s Annual Report on Form 20-F for the year ended December 31, 2014 and incorporated herein by reference.

(5) Previously filed as exhibits 4.9 to the Company’s Annual Report on Form 20-F for the year ended December 31, 2015 and incorporated herein by reference.

(6) Previously filed as exhibit 4.10 to the Company’s Annual Report on Form 20-F for the year ended December 31, 2016 and incorporated herein by reference.

(7) Previously filed as exhibit 4.11 to the Company’s Annual Report on Form 20-F for the year ended December 31, 2016 and incorporated herein by reference.

(8) Previously filed as exhibits 4.12 and 4.13 to the Company's Annual Report on Form 20-F for the year ended December 31, 2017 and incorporated herein by reference.

SIGNATURE

The registrant hereby certifies that it meets all of the requirements for filing on Form 20-F and that it has duly caused and authorized the undersigned to sign this annual report on its behalf.

CERAGON NETWORKS LTD.

By: /s/ Ira Palti

Name: Ira Palti

Title: President and Chief Executive Officer

Date: March 31, 2019

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CERAGON NETWORKS LTD. AND SUBSIDIARIES

CONSOLIDATED FINANCIAL STATEMENTS

AS OF DECEMBER 31, 2018

IN U.S. DOLLARS

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Kost Forer Gabbay & Kasierer Tel: +972-3-6232525  
144 Menachem Begin Road Fax: +972-3-5622555  
Tel-Aviv 6492102, Israel ey.com

## REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Board of Directors and Shareholders of Ceragon Networks Ltd.

### Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Ceragon Networks Ltd. and its subsidiaries (the "Company") as of December 31, 2018 and 2017, and the related consolidated statements of operations, comprehensive income, changes in shareholders' equity and cash flows for each of the three years in the period ended December 31, 2018, and the related notes (collectively referred to as the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company at December 31, 2018 and 2017, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2018, in conformity with U.S. generally accepted accounting principles.

We did not audit the financial statements of Ceragon America Latina Ltda., a wholly-owned subsidiary, which reflect total assets constituting 5.32% at December 31, 2018, respectively, and total revenues constituting 4.8% in 2018, of the related consolidated totals. Those statements were audited by other auditors whose report has been furnished to us, and our opinion, insofar as it relates to the amounts included for Ceragon America Latina Ltda., is based solely on the report of the other auditors.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2018, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) and our report dated March 20, 2019 expressed an unqualified opinion thereon.

### Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits and the report of other auditors provide a reasonable basis for our opinion.

/s/KOST FORER GABBAY & KASIERER  
A Member of Ernst & Young Global

We have served as the Company's auditor since 2002

Tel-Aviv, Israel

March 31, 2019

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Kost Forer Gabbay & Kasierer Tel: +972-3-6232525  
144 Menachem Begin Road Fax: +972-3-5622555  
Tel-Aviv 6492102, Israel ey.com

## REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Shareholders and the Board of Directors of Ceragon Networks Ltd.

### Opinion on Internal Control over Financial Reporting

We have audited Ceragon Networks Ltd.'s and its subsidiaries (the "Company") internal control over financial reporting as of December 31, 2018, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) (the "COSO criteria"). In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2018, based on the COSO criteria.

We did not examine the effectiveness of internal control over financial reporting of Ceragon America Latina Ltda., a wholly owned subsidiary, whose financial statements reflect total assets and revenues constituting 5.32% and 4.8%, respectively, of the related consolidated financial statement amounts as of and for the year ended December 31, 2018. The effectiveness of Ceragon America Latina Ltda.'s internal control over financial reporting was audited by other auditors whose report has been furnished to us, and our opinion, insofar as it relates to the effectiveness of Ceragon America Latina Ltda.'s internal control over financial reporting, is based solely on the report of the other auditors.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated balance sheets of the Company as of December 31, 2018 and 2017, and the related consolidated statements of operations, statements of comprehensive income, changes in shareholders' equity and cash flows for each of the three years in the period ended December 31, 2018 and the related notes of the Company and our report dated March 20, 2019 expressed an unqualified opinion thereon.

### Basis for Opinion

The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting included in the accompanying Management's Annual Report on Internal Control over Financial Reporting. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects.

Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audits and the report of other auditors provide a reasonable basis for our opinion.

#### Definition and Limitations of Internal Control Over Financial Reporting

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

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

/s/KOST FORER GABBAY & KASIERER  
A Member of Ernst & Young Global

Tel-Aviv, Israel  
March 31, 2019

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## CERAGON NETWORKS LTD. AND SUBSIDIARIES

## CONSOLIDATED BALANCE SHEETS

U.S. dollars in thousands

	Note	December 31,	
		2017	2018
<b>ASSETS</b>			
<b>CURRENT ASSETS:</b>			
Cash and cash equivalents		\$25,877	\$35,581
Short- term bank deposits		-	515
Trade receivables (net of allowance for doubtful accounts of \$ 7,883 and \$ 4,327 at December 31, 2017 and 2018, respectively)		113,719	123,451
Other accounts receivable and prepaid expenses	3	17,052	12,135
Inventories	4	54,164	53,509
<u>Total</u> current assets		210,812	225,191
<b>NON-CURRENT ASSETS:</b>			
Long-term bank deposits		996	504
Deferred tax assets	13c	988	7,476
Severance pay and pension fund		5,459	5,096
Other non-current assets		3,269	4,544
<b>PROPERTY AND EQUIPMENT, NET</b>	5	29,870	33,613
<b>INTANGIBLE ASSETS, NET</b>	6	2,199	6,576
<u>Total</u> long-term assets		42,781	57,809
<u>Total</u> assets		\$253,593	\$283,000

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

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## CERAGON NETWORKS LTD. AND SUBSIDIARIES

## CONSOLIDATED BALANCE SHEETS

U.S. dollars in thousands (except share and per share data)

	December 31,	
	Note	2017      2018
<b>LIABILITIES AND SHAREHOLDERS' EQUITY</b>		
<b>CURRENT LIABILITIES:</b>		
Trade payables		75,476      78,892
Deferred revenues		5,193      3,873
Other accounts payable and accrued expenses	7	24,781      27,256
<u>Total</u> current liabilities		105,450      110,021
<b>LONG-TERM LIABILITIES:</b>		
Deferred tax liability	13c	141      28
Accrued severance pay and pensions		10,085      9,711
Other long-term liabilities		4,019      3,672
<u>Total</u> long-term liabilities		14,245      13,411
<b>COMMITMENTS AND CONTINGENT LIABILITIES</b>	11	
<b>SHAREHOLDERS' EQUITY:</b>	12	
Share capital -		
Ordinary shares of NIS 0.01 par value -		
Authorized: 120,000,000 shares at December 31, 2017 and 2018; Issued: 81,526,715		
and 83,571,181 shares at December 31, 2017 and 2018, respectively; Outstanding:		
78,045,192 and 80,089,658 shares at December 31, 2017 and 2018, respectively		214      214
Additional paid-in capital		410,817      415,408
Treasury shares at cost – 3,481,523 ordinary shares as of December 31, 2017 and 2018		(20,091 )      (20,091 )
Accumulated other comprehensive loss		(7,171 )      (9,208 )
Accumulated deficit		(249,871)      (226,755)
<u>Total</u> shareholders' equity		133,898      159,568
<u>Total</u> liabilities and shareholders' equity		\$253,593      \$283,000

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

## CERAGON NETWORKS LTD. AND SUBSIDIARIES

## CONSOLIDATED STATEMENTS OF OPERATIONS

U.S. dollars in thousands (except share and per share data)

		Year ended December 31,		
	Note	2016	2017	2018
Revenues	14	\$293,641	\$332,033	\$343,874
Cost of revenues		194,479	224,698	227,705
Gross profit		99,162	107,335	116,169
Operating expenses:				
Research and development, net		21,695	25,703	28,180
Selling and marketing		39,515	41,656	42,961
General and administrative		20,380	18,576	19,354
Other income		(1,921)	(1,746)	(470)
<u>Total</u> operating expenses		79,669	84,189	90,025
Operating income		19,493	23,146	26,144
Financial expenses, net	16	6,303	5,889	6,349
Income before taxes on income		13,190	17,257	19,795
Taxes on income (benefit)	13b	1,761	1,697	(3,251)
Net income		\$11,429	\$15,560	\$23,046
Net Income per share:				
Basic net income per share		\$0.15	\$0.20	\$0.29
Diluted net income per share		\$0.15	\$0.19	\$0.28
Weighted average number of ordinary shares used in computing basic net income per share		77,702,788	77,916,912	78,579,013
Weighted average number of ordinary shares used in computing diluted net income per share		78,613,528	79,942,353	81,021,527

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## CERAGON NETWORKS LTD. AND SUBSIDIARIES

## CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME

U.S. dollars in thousands

	Year ended December 31,		
	2016	2017	2018
Net income	\$11,429	\$15,560	\$23,046
Other comprehensive income (loss):			
Change in foreign currency translation adjustment	861	118	(1,150)
Cash flow hedges:			
Change in net unrealized gains (losses)	168	2,331	(2,260)
Amounts reclassified from AOCI	(261)	(1,772)	1,373
Net change	(93)	559	(887)
Other comprehensive income (loss), net	768	677	(2,037)
Total of comprehensive income	\$12,197	\$16,237	\$21,009

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

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## CERAGON NETWORKS LTD. AND SUBSIDIARIES

## CONSOLIDATED STATEMENTS OF CHANGES IN SHAREHOLDERS' EQUITY

U.S. dollars in thousands (except share and per share data)

	Ordinary shares	Share capital	Additional paid-in capital	Treasury shares at cost	Accumulated other comprehensive loss	Accumulated deficit	Total shareholders' equity
Balance as of January 1, 2016	77,636,864	\$ 214	\$ 408,174	\$(20,091)	\$ (8,616 )	\$(276,860 )	\$ 102,821
Exercise of options and RSU's	132,065	*)-	75	-	-	-	75
Share-based compensation expense	-	-	1,071	-	-	-	1,071
Other comprehensive income, net	-	-	-	-	768	-	768
Net income	-	-	-	-	-	11,429	11,429
Balance as of December 31, 2016	77,768,929	214	409,320	(20,091)	(7,848 )	(265,431 )	116,164
Exercise of options and RSU's	276,263	*)-	294	-	-	-	294
Share-based compensation expense	-	-	1,203	-	-	-	1,203
Other comprehensive income, net	-	-	-	-	677	-	677
Net income	-	-	-	-	-	15,560	15,560
Balance as of December 31, 2017	78,045,192	214	410,817	(20,091)	(7,171 )	(249,871 )	133,898
Cumulative effect of the new revenue recognition standard	-	-	-	-	-	70	70
Exercise of options and RSU's	2,044,466	*)-	2,611	-	-	-	2,611
Share-based compensation expense	-	-	1,980	-	-	-	1,980
Other comprehensive loss, net	-	-	-	-	(2,037 )	-	(2,037 )
Net income	-	-	-	-	-	23,046	23,046
Balance as of December 31, 2018	80,089,658	214	415,408	(20,091)	(9,208 )	(226,755 )	159,568

\*) Represent an amount lower than \$1.

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

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## CERAGON NETWORKS LTD. AND ITS SUBSIDIARIES

## CONSOLIDATED STATEMENTS OF CASH FLOWS

U.S. dollars in thousands

	Year ended		
	December 31,		
	2016	2017	2018
<u>Cash flows from operating activities:</u>			
Net income	\$11,429	\$15,560	\$23,046
Adjustments required to reconcile net income to net cash provided by operating activities:			
Depreciation and amortization	10,037	9,205	7,758
Share-based compensation expense	1,071	1,203	1,980
Accrued severance pay and pensions, net	28	3	(11 )
Decrease (increase) in trade receivables, net	11,051	(6,403 )	(11,098)
Decrease (increase) in other accounts receivable and prepaid expenses (including other long term assets)	4,747	(259 )	4,624
Decrease (increase) in inventories	4,706	(8,592 )	(956 )
Increase (decrease) in trade payables	(2,355 )	4,836	2,340
Increase (decrease) in deferred revenues	(6,228 )	2,575	(650 )
Decrease )increase) in deferred tax assets, net	478	497	(6,601 )
Increase (decrease) in other accounts payable and accrued expenses (including other long term liabilities)	(9,193 )	(1,474 )	2,062
Net cash provided by operating activities	25,771	17,151	22,494
<u>Cash flows from investing activities:</u>			
Purchase of property and equipment, net	(8,190 )	(8,533 )	(10,303)
Purchase and capitalization of intangible assets, net	-	(1,407 )	(3,412 )
Investment in bank deposits	(153 )	(996 )	48
Investment in shares	-	-	(1,628 )
Proceeds from maturities of short-term bank deposits	153	-	-
Net cash used in investing activities	(8,190 )	(10,936)	(15,295)

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

## CERAGON NETWORKS LTD. AND ITS SUBSIDIARIES

## CONSOLIDATED STATEMENTS OF CASH FLOWS

U.S. dollars in thousands

	Year ended December 31,		
	2016	2017	2018
<u>Cash flows from financing activities:</u>			
Repayment of bank loan	(17,922)	(17,000)	-
Proceeds from exercise of options	75	294	2,611
Net cash (used in) provided by financing activities	(17,847)	(16,706)	2,611
Effect of exchange rate changes on cash	286	30	(106 )
Increase (decrease) in cash and cash equivalents	20	(10,461)	9,704
Cash and cash equivalents at the beginning of the year	36,318	36,338	25,877
Cash and cash equivalents at the end of the year	\$36,338	\$25,877	\$35,581
<u>Supplemental disclosure of cash flow information:</u>			
Cash paid during the year for income taxes	\$1,370	\$2,493	\$1,617
Cash paid during the year for interest	\$1,739	\$1,837	\$1,752

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

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CERAGON NETWORKS LTD. AND ITS SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

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U.S. dollars in thousands (except share data)

NOTE 1:- GENERAL

Ceragon Networks Ltd. ("the Company") is a wireless backhaul specialist. It provides wireless backhaul solutions that enable cellular operators and other wireless service providers to deliver voice and data services, enabling smart-phone applications such as internet browsing, social networking applications, image sharing, music and video applications. Its wireless backhaul solutions use microwave radio technology to transfer large amounts of telecommunication traffic between base stations and small-cells and the core of the service provider's network. The Company also provides wireless fronthaul solutions that use microwave technology for ultra-high speed, ultra-low latency communication between LTE/LTE-Advanced base band digital units stations and remote radio heads.

The Company's solutions support all wireless access technologies, including LTE-Advanced, LTE, HSPA, EV-DO, CDMA, W-CDMA and GSM. The Company's systems also serve evolving network architectures including all-IP long haul networks.

The Company sells its products through a direct sales force, systems integrators, distributors and original equipment manufacturers.

The Company's wholly owned subsidiaries provide research and development, marketing, manufacturing, distribution, sales and technical support to the Company's customers worldwide.

As to principal markets and major customers, see notes 15b and 15c.

b. Acquisitions:

In December 2017 the Company signed software license agreement with Compass Networks LTD ("Compass") in the amount of \$ 500 and additional agreement for the purpose of developing Disaggregate Microwave products in August 2018, in the amount of up to \$1,500 (out of which \$ 700 was recognized as of December 2018) (see note 6). In addition, the Company signed loan agreements with Compass in the amount of \$ 538, which bear an annual interest rate of 10%.

In December 2018, the company purchased 11% of the share capital of Compass for a consideration of \$ 833. A total investment (including loans) in the amount of \$1,628 was recorded under other non-current assets (see note 2z).

NOTE 2:- SIGNIFICANT ACCOUNTING POLICIES

a. Basis of presentation:

The consolidated financial statements have been prepared in accordance with accounting principles generally accepted in the U.S. ("U.S. GAAP").

CERAGON NETWORKS LTD. AND ITS SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

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U.S. dollars in thousands (except share data)

NOTE 2:- SIGNIFICANT ACCOUNTING POLICIES (Cont.)

b. Use of estimates:

The preparation of the consolidated financial statements in conformity with U.S. Generally Accepted Accounting Principles ("GAAP") requires management to make estimates, judgments and assumptions that affect the amounts reported and disclosed in the financial statements and the accompanying notes. Actual results could differ materially from those estimates. On an ongoing basis, the Company's management evaluates its estimates, including those related to accounts receivable, fair values and useful lives of intangible assets, fair values of stock-based awards, income taxes, and contingent liabilities, among others. Such estimates are based on historical experience and on various other assumptions that are believed to be reasonable, the results of which form the basis for making judgments about the carrying values of the Company's assets and liabilities.

c. Financial statements in U.S. dollars:

A majority of the revenues of the Company and certain of its subsidiaries are generated in U.S. dollars ("dollars"). In addition, a substantial portion of the Company's and certain of its subsidiaries' costs is incurred in dollars. Since management believes that the dollar is the currency of the primary economic environment in which the Company and its subsidiaries operate and considers the non-U.S. subsidiaries to be a direct, integral extension of the parent company's operations, the dollar is its functional and reporting currency.

Accordingly, amounts in currencies other than U.S dollars have been re-measured in accordance with ASC topic 830, "Foreign Currency Matters" ("ASC 830") as follows:

Monetary balances - at the exchange rate in effect on the balance sheet date. Consolidated statements of operations items - average exchange rates prevailing during the year.

All exchange gains and losses from the re-measurement mentioned above are reflected in the statement of operations in financial expenses, net.

The financial statements of the Company's Brazilian subsidiary, whose functional currency is not the dollar, have been re-measured and translated into dollars. All amounts on the balance sheets have been translated into the dollar using the exchange rates in effect on the relevant balance sheet dates. All amounts in the statements of operations have been translated into the dollar using the average exchange rate for the relevant periods. The resulting translation adjustments are reported as a component of accumulated other comprehensive income (loss) in shareholders' equity.

d. Principles of consolidation:

The consolidated financial statements include the accounts of the Company and its subsidiaries ("the Group"). Intercompany balances and transactions including profits from intercompany sales not yet realized outside the Group, have been eliminated upon consolidation.



CERAGON NETWORKS LTD. AND ITS SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

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U.S. dollars in thousands (except share data)

NOTE 2:- SIGNIFICANT ACCOUNTING POLICIES (Cont.)

e. Cash equivalents:

Cash equivalents include short-term, highly liquid investments that are readily convertible to cash with original maturities of three months or less.

f. Short term bank deposits:

Short-term bank deposits are deposits with an original maturity of more than three months from the date of investment and which do not meet the definition of cash equivalents.

g. Long-term bank deposits:

Long-term bank deposits are deposits with an original maturity of more than twelve months from the date of investment and which do not meet the definition of cash equivalents.

h. Inventories:

Inventories are stated at the lower of cost or net realizable value. Inventory write-downs are provided to cover risks arising from slow-moving items, technological obsolescence, excess inventories, discontinued products, and for market prices lower than cost, if any.

The Company periodically evaluates the quantities on hand relative to historical and projected sales volume (which is determined based on an assumption of future demand and market conditions) and the age of the inventory. At the point of the loss recognition, a new lower cost basis for that inventory is established. In addition, if required the Company records a liability for firm non-cancelable and unconditional purchase commitments with contract manufacturers for quantities in excess of the Company's future demands forecast consistent with its valuation of excess and obsolete inventory.

Inventory includes costs of products delivered to customers and not recognized as cost of sales, where revenues in the related arrangements were not recognized.

Cost is determined for all types of inventory using the moving average cost method plus indirect costs.

## CERAGON NETWORKS LTD. AND ITS SUBSIDIARIES

## NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

U.S. dollars in thousands (except share data)

## NOTE 2:- SIGNIFICANT ACCOUNTING POLICIES (Cont.)

## i. Property and equipment:

Property and equipment are stated at cost, net of accumulated depreciation. Depreciation is calculated by the straight-line method over the estimated useful lives of the assets, at the following annual rates:

	%
Computers, manufacturing and peripheral equipment	6 – 33
Enterprise Resource Planning systems ("ERP")	10
Office furniture and equipment	Mainly 15
Leasehold improvements	Over the shorter of the term of the lease or useful life of the asset

## j. Impairment of long-lived assets:

The Company's and its subsidiaries' long-lived assets are reviewed for impairment in accordance with ASC topic 360, "Property Plant and Equipment", ("ASC 360"), whenever events or changes in circumstances indicate that the carrying amount of an asset may not be recoverable. Recoverability of assets to be held and used is measured by a comparison of the carrying amount of an asset to the future undiscounted cash flows expected to be generated by the asset. If an asset is considered to be impaired, the impairment to be recognized is measured by the amount by which the carrying amount of the asset exceeds its fair value. During 2016, 2017 and 2018, no impairment losses have been recognized.

## k. Income taxes:

The Company and its subsidiaries account for income taxes in accordance with ASC topic 740, "Income Taxes", ("ASC 740"). This Statement prescribes the use of the liability method whereby deferred tax asset and liability account balances are determined based on differences between the financial reporting and tax bases of assets and liabilities and for carry forward losses deferred taxes are measured using the enacted tax rates and laws that will be in effect when the differences are expected to reverse. The Company and its subsidiaries provide a valuation allowance, if necessary, to reduce deferred tax assets to their estimated realizable value if it is more likely than not that some portion or all of the deferred tax asset will not be realized. For more information see note 13c.

The Company adopted ASC topic 740-10, "Income Taxes", ("ASC 740-10"). ASC 740-10 contains a two-step approach to recognizing and measuring uncertain tax positions accounted for in accordance with ASC 740. The first step is to evaluate the tax position taken or expected to be taken in a tax return by determining if the weight of available evidence indicates that it is more likely than not that, on an evaluation of the technical merits, the tax position will be sustained on audit, including resolution of any related appeals or litigation processes. The second step is to measure the tax benefit as the largest amount that is more than 50% likely to be realized upon ultimate settlement. The Company elected to classify interest expenses and penalties recognized in the financial statements as income taxes. For more information see note 13g.



CERAGON NETWORKS LTD. AND ITS SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

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U.S. dollars in thousands (except share data)

NOTE 2:- SIGNIFICANT ACCOUNTING POLICIES (Cont.)

l. Intangible assets, net:

Intangible assets consist of technology and incurred software development costs capitalized in accordance with ASC 985-20, "Software - Costs of Software to be Sold, Leased, or Marketed".

Intangible assets that are considered to have definite useful life are amortized using the straight-line basis over their estimated useful lives. The Company has not started to amortize the technology asset and software development costs. The Company will start to amortize the technology upon sale of the related developed products.

m. Revenue recognition:

The Company recognizes revenue when (or as) it satisfies performance obligations by transferring promised products or services to its customers in an amount that reflects the consideration the Company expects to receive. The Company applies the following five steps: (1) identify the contract with a customer, (2) identify the performance obligations in the contract, (3) determine the transaction price, (4) allocate the transaction price to the performance obligations in the contract, and (5) recognize revenue when a performance obligation is satisfied.

The Company considers customer purchase orders, which in some cases are governed by master sales agreements, to be the contracts with a customer. For each contract, the Company considers the promise to transfer tangible products, network roll-out, professional services and customer support, each of which are distinct, to be the identified performance obligations. In determining the transaction price, the Company evaluates whether the price is subject to rebates and adjustments to determine the net consideration to which the Company expects to receive. As the Company's standard payment terms are less than one year, the contracts have no significant financing component. The Company allocates the transaction price to each distinct performance obligation based on their relative standalone selling price. Revenue from tangible products is recognized at a point in time when control of the product is transferred to the customer (i.e., when the Company's performance obligation is satisfied).

The revenues from customer support and extended warranty is recognized ratably over the contract period and the costs associated with these contracts are recognized as incurred. Revenues from network roll-out and professional services are recognized when the Company's performance obligation is satisfied, usually upon customer acceptance.

Most of the Company's distributors are entitled to a right of return related to stock rotation and rebates. Distributors have the right to return a certain amount of product in exchange for new products, and/or the right for rebates, according to the agreed specification in the contracts.

CERAGON NETWORKS LTD. AND ITS SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

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U.S. dollars in thousands (except share data)

NOTE 2:- SIGNIFICANT ACCOUNTING POLICIES (Cont.)

n. Research and development expenses, net:

Research and development expenses, net of government grants, are charged to the statement of operations as incurred, except for development expenses which were capitalized in accordance with ASC 985-20 "Software – Costs of Software to be Sold, Leased, or Marketed" (see 1 above).

o. Warranty costs:

The Company generally offers a standard limited warranty, including parts and labor for an average period of 1-3 years for its products. The Company estimates the costs that may be incurred under its basic limited warranty and records a liability in the amount of such costs at the time product revenue is recognized. Factors that affect the Company's warranty liability include the number of installed units, historical and anticipated rates of warranty claims, and cost per claim. The Company periodically assesses the adequacy of its recorded warranty liability and adjusts the amounts as necessary.

The Company recorded income (expenses) from decrease (increase) of warranty provision for the years ended December 31, 2016, 2017 and 2018 in the amount of \$ 252, \$ 437 and \$ (83), respectively. As of December 31, 2017 and 2018, the warranty provision was \$ 2,023 and \$2,106, respectively.

p. Derivative instruments:

The Company has instituted a foreign currency cash flow hedging program using foreign currency forward contracts ("derivative instruments") in order to hedge the exposure to variability in expected future cash flows resulting from changes in related foreign currency exchange rates. These transactions are designated as cash flow hedges, as defined under ASC topic 815, "Derivatives and Hedging".

ASC 815 requires companies to recognize all of their derivative instruments as either assets or liabilities in the financial statements at fair value. The Company measured the fair value of the contracts in accordance with ASC topic 820, "Fair value Measurement and Disclosures" at Level 2 (see also note 2v). The accounting for changes in the fair value (i.e., gains or losses) of a derivative instrument depends on whether it has been designated and qualifies as part of a hedging relationship and further, on the type of hedging relationship.

For those derivative instruments that are designated and qualify as hedging instruments, a company must designate the hedging instrument, based upon the exposure being hedged, as a fair value hedge, cash flow hedge or a hedge of a net investment in a foreign operation.

For derivative instruments that are designated and qualify as a cash flow hedge (i.e., hedging the exposure to variability in expected future cash flows that is attributable to a particular risk), the effective portion of the gain or loss on the derivative instrument is reported as a component of other comprehensive income (loss), net of taxes and reclassified into earnings in the same period or periods during which the hedged transaction affects earnings. The non-effective portion of the derivative's change in fair value is recognized in earnings.





CERAGON NETWORKS LTD. AND ITS SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

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U.S. dollars in thousands (except share data)

NOTE 2:- SIGNIFICANT ACCOUNTING POLICIES (Cont.)

For derivative instruments that are designated as fair value hedges (i.e, hedging of portion of its certain monetary items in the balance sheet), the portion of gains and losses on these forward contracts is recognized in earnings.

The Company's cash flow hedging program is to hedge against the risk of overall changes in cash flows resulting from forecasted foreign currency salary payments during the year. The Company hedges portions of its forecasted expenses denominated in NIS with forward exchange contracts. These forward exchange contracts are designated as cash flow hedges, as defined by ASC 815.

q. Concentrations of credit risk:

Financial instruments that potentially subject the Company and its subsidiaries to concentrations of credit risk consist principally of cash and cash equivalents, short-term bank deposits, trade receivables.

The majority of the Company's cash and cash equivalents are maintained in U.S. dollar. Generally, these cash and cash equivalents and deposits may be redeemed upon demand. Management believes that the financial institutions that hold the Company's and its subsidiaries' cash and cash equivalents are institutions with high credit standing, and accordingly, minimal credit risk exists with respect to these assets.

The Company's trade receivables are geographically diversified and derived from sales to customers mainly in the Europe, North America, Latin America, India and Asia. The Company and its subsidiaries generally do not require collateral; however, in certain circumstances, the Company and its subsidiaries may require letters of credit, additional guarantees or advance payments.

The Company and its subsidiaries perform ongoing credit evaluations of their customers and insure certain trade receivables under credit insurance policies.

r. Allowance for doubtful debt:

An allowance for doubtful accounts is determined with respect to specific receivables, of which the collection may be doubtful. The Company charges off receivables when they are deemed uncollectible.

s. Transfers of financial assets:

ASC 860 "Transfers and Servicing", ("ASC 860"), establishes a standard for determining when a transfer of financial assets should be accounted for as a sale. The Company's arrangements are such that the underlying conditions are met for the transfer of financial assets to qualify for accounting as a sale. The transfers of financial assets are typically performed by the factoring of receivables to two financial institutions.

CERAGON NETWORKS LTD. AND ITS SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

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U.S. dollars in thousands (except share data)

NOTE 2:- SIGNIFICANT ACCOUNTING POLICIES (Cont.)

As of December 31, 2017 and 2018, the Company sold trade receivables to several different financial institutions in a total net amount of \$ 19,797 and \$ 6,968, respectively. Control and risk of those trade receivables were fully transferred in accordance with ASC 860.

During the years ended on December 31, 2016, 2017 and 2018, the Company recorded amounts of \$ 536, \$ 553 and \$ 585, respectively, as financial expense related to its factoring arrangements.

t. Severance pay:

The Company's severance pay liability for its Israeli employees is calculated pursuant to Israel's Severance Pay Law based on the most recent salary of the employees multiplied by the number of years of employment, as of the balance sheet date. Employees are entitled to one month's salary for each year of employment or a portion thereof. The Company's liability for all of its employees in Israel is covered by monthly deposits with pension funds, insurance policies and an accrual. The value of the funds deposited into pension funds and insurance policies is recorded as an asset - severance pay fund - in the Company's balance sheet.

The severance pay fund includes the deposited funds and accumulated adjustments to the Israeli Consumer Price Index up to the balance sheet date. The deposited funds may be withdrawn only upon the fulfillment of the obligation pursuant to Israel's Severance Pay Law or labor agreements. The value of the deposited funds in insurance policies, is based on the cash surrendered value of these policies, and includes profits / losses.

Starting April 2009, the Company's agreements with new employees in Israel are under section 14 of the Severance Pay Law -1963. The Company's contributions for severance pay shall replace its severance obligation, no additional calculations shall be conducted between the parties regarding the matter of severance pay and no additional payments shall be made by the Company to the employee. Further, the related obligation and amounts deposited on behalf of such obligation are not stated on the balance sheet, as the Company is legally released from obligation to employees once the deposit amounts have been paid.

As of December 2017 and 2018, accrued severance pay amounted to \$ 7,962, and \$ 7,409 respectively. Severance expense for the years ended December 31, 2016, 2017 and 2018, amounted to approximately \$ 1,662, \$ 1,852 and \$2,107, respectively.

The Company accounts, for its obligations for pension and other postretirement benefits in accordance with ASC 715, "Compensation - Retirement Benefits". For more information refer to note 10.

## CERAGON NETWORKS LTD. AND ITS SUBSIDIARIES

## NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

U.S. dollars in thousands (except share data)

## NOTE 2:- SIGNIFICANT ACCOUNTING POLICIES (Cont.)

## u. Accounting for stock-based compensation:

ASC topic 718, "Compensation - Stock Compensation", ("ASC 718"), requires companies to estimate the fair value of equity-based payment awards on the date of grant using an option-pricing model. The value of the portion of the award that is ultimately expected to vest is recognized as an expense over the requisite service periods in the Company's consolidated statements of operations.

the Company estimates the fair value of stock options granted under ASC 718 using the binomial model with the following weighted-average assumptions for 2016, 2017 and 2018:

	December 31,		
	2016	2017	2018
Dividend yield	0%	0%	0%
Volatility	51%-73%	53%-69%	53%-62%
Risk free interest	0.2%-2.1%	0.8%-2.2%	1.8%-2.9%
Early exercise multiple	2.20-3.40	2.10-2.20	2.00-2.30

Risk-free interest rates are based on the yield from U.S. Treasury zero-coupon bonds with a term equivalent to the contractual life of the options; volatility of price of the Company's shares based upon actual historical stock price movements. The Early exercise factor is representing the value of the underlying stock as a multiple of the exercise price of the option which, if achieved, results in exercise of the option.

Early exercise multiple is based on actual historical exercise activity. The expected term of the options granted is derived from output of the option valuation model and represents the period of time that options granted are expected to be outstanding.

The Company recognizes compensation expense using the accelerated method for all awards ultimately expected to vest. Estimated forfeitures are based on historical pre-vesting forfeitures and on management's estimates. ASC topic 718 requires forfeitures to be estimated and revised, if necessary, in subsequent periods if actual forfeitures differ from those estimates.

## v. Fair value of financial instruments:

The Company applies ASC 820, "Fair Value Measurements and Disclosures". Under this standard, fair value is defined as the price that would be received to sell an asset or paid to transfer a liability (i.e., the "exit price") in an orderly transaction between market participants at the measurement date.

CERAGON NETWORKS LTD. AND ITS SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

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U.S. dollars in thousands (except share data)

NOTE 2:- SIGNIFICANT ACCOUNTING POLICIES (Cont.)

In determining fair value, the Company uses various valuation approaches. ASC 820 establishes a hierarchy for inputs used in measuring fair value that maximizes the use of observable inputs and minimizes the use of unobservable inputs by requiring that the most observable inputs be used when available. Observable inputs are inputs that market participants would use in pricing the asset or liability developed based on market data obtained from sources independent of the Company. Unobservable inputs are inputs that reflect the Company's assumptions about the assumptions market participants would use in pricing the asset or liability developed based on the best information available in the circumstances.

The hierarchy is broken down into three levels based on the inputs as follows:

Valuations based on quoted prices in active markets for identical assets that the Company has the ability to Level access. Valuation adjustments and block discounts are not applied to Level 1 instruments. Since valuations are 1 - based on quoted prices that are readily and regularly available in an active market, valuation of these products does not entail a significant degree of judgment.

Level 2 Valuations based on one or more quoted prices in markets that are not active or for which all significant - inputs are observable, either directly or indirectly.

Level 3 - Valuations based on inputs that are unobservable and significant to the overall fair value measurement.

The availability of observable inputs can vary from investment to investment and is affected by a wide variety of factors, including, for example, the type of investment, the liquidity of markets and other characteristics particular to the transaction. To the extent that valuation is based on models or inputs that are less observable or unobservable in the market, the determination of fair value requires more judgment and the investments are categorized as Level 3.

The following methods and assumptions were used by the Company and its subsidiaries in estimating their fair value disclosures for financial instruments:

The carrying amounts of cash and cash equivalents, trade receivables, other accounts receivable, trade payables, and other accounts payable and accrued expenses approximate their fair values due to the short-term maturities of such instruments.

The derivative instruments are classified within Level 2 as the valuation inputs are based on quoted prices and market observable data of similar instruments.

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## CERAGON NETWORKS LTD. AND ITS SUBSIDIARIES

## NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

U.S. dollars in thousands (except share data)

## NOTE 2:- SIGNIFICANT ACCOUNTING POLICIES (Cont.)

## w. Comprehensive income:

The Company accounts for comprehensive income in accordance with ASC topic 220, "Comprehensive Income". This statement establishes standards for the reporting and display of comprehensive income and its components in a full set of general purpose financial statements. Comprehensive income generally represents all changes in stockholders' equity during the period except those resulting from investments by, or distributions to, stockholders.

The components of AOCI, were as follows:

	Unrealized Gains (Losses) on Cash Flow Hedges	Foreign Currency Translation Adjustments	Total
Balance as of January 1, 2018	\$ 303	\$ (7,474)	) \$(7,171)
Other comprehensive income before reclassifications	(2,260 )	(1,150 )	) (3,410)
Amounts reclassified from AOCI	1,373	-	) 1,373
Other comprehensive income	(887 )	(1,150 )	) (2,037)
Balance as of December 31, 2018	\$ (584 )	\$ (8,624 )	) \$(9,208)

The effects on net income of amounts reclassified from Accumulated other comprehensive income ("AOCI") for the year ended December 31, 2018 derive from realized gains on cash flow hedges, included in operating expenses.

## x. Treasury shares:

The Company repurchased its ordinary shares on the open-market and holds such shares as Treasury shares. The Company presents the cost of repurchased treasury shares as a reduction of shareholders' equity.

## y. Basic and diluted net earnings per share:

Basic net earnings per share are computed based on the weighted average number of ordinary shares outstanding during each year. Diluted net earnings per share is computed based on the weighted average number of ordinary shares outstanding during each year, plus dilutive potential ordinary shares considered outstanding during the year, in accordance with ASC topic 260, "Earnings Per Share" ("ASC 260").

The total weighted average number of shares related to the outstanding options excluded from the calculations of diluted net earnings per share due to their anti-dilutive effect was 3,848,290, 4,668,032 and 2,426,689 for the years

ended December 31, 2016, 2017 and 2018, respectively.

z. Equity method investment

Investments in companies that are not controlled but over which the Company can exercise significant influence are presented using the equity method of accounting.

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CERAGON NETWORKS LTD. AND ITS SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

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U.S. dollars in thousands (except share data)

NOTE 2:- SIGNIFICANT ACCOUNTING POLICIES (Cont.)

aa. Impact of recently issued Accounting Standards:

In May 2014, the FASB issued Accounting Standards Update No. 2014-09, Revenue from Contracts with Customers (Topic 606). The Company adopted the new standard, effective January 1, 2018, using the modified retrospective method applied to those contracts which were not substantially completed as of the adoption date (see Note 14).

In July 2018, the FASB issued ASU No. 2018-11, Leases (Topic 842): Targeted Improvements. The standard provides an additional transition method that allows entities to apply the new leases standard at adoption date and recognize a cumulative effect adjustment to the opening balance of retained earnings in the period of adoption. The Company elected this new transition method when it adopted ASU 2016-02 on January 1, 2019.

In February 2016, the FASB issued ASU No. 2016-02, Leases (Topic 842). The standard requires lessees to recognize almost all leases on the balance sheet as a right-of-use asset and a lease liability and requires leases to be classified as either an operating or a finance type lease. The standard excludes leases of intangible assets or inventory. The standard became effective for the Company beginning January 1, 2019. The Company has estimated the opening balances of the right-of-use assets and lease liabilities upon adopting the standard as of January 1, 2019 to be approximately \$7.0 million and \$7.0 million, respectively. The Company is still in the process of finalizing the calculation.

In August 2017, the FASB issued ASU 2017-12, Derivatives and Hedging (Topic 815): Targeted Improvements to Accounting for Hedging Activities, which expands the activities that qualify for hedge accounting and simplifies the rules for reporting hedging transactions. The standard is effective for the interim and annual periods beginning on or after December 15, 2018. Early adoption is permitted. The standard is not expected to have a material impact on the Company's consolidated financial statements and related disclosures.

In September 2016, the FASB issued ASU 2016-13, "Financial Instruments - Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments". ASU 2016-13 changes the impairment model for most financial assets and certain other instruments. For trade and other receivables, held-to-maturity debt securities, loans, and other instruments, entities will be required to use a new forward-looking "expected loss" model that generally will result in the earlier recognition of allowances for losses. The guidance also requires increased disclosures. For public business entities that are SEC filers, the new standard is effective for interim and annual periods beginning after December 15, 2019. For all other public business entities, the amendments in this update are effective for fiscal years beginning after December 15, 2020, including interim periods within those fiscal years. Early adoption is permitted. The Company is evaluating the impact of the new standard on its consolidated financial statements.



## CERAGON NETWORKS LTD. AND ITS SUBSIDIARIES

## NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

U.S. dollars in thousands (except share data)

## NOTE 2:- SIGNIFICANT ACCOUNTING POLICIES (Cont.)

ab. Fair value measurement:

The Company's financial assets (liabilities) measured at fair value on a recurring basis, excluding accrued interest components, consisted of the following types of instruments:

	Year ended December 31, 2018 Fair value measurements using input type Level 2		Total
Derivatives instruments	\$(1,028)		\$(1,028)
Total liabilities	\$(1,028)		\$(1,028)

	Year ended December 31, 2017 Fair value measurements using input type Level 2		Total
Derivatives instruments	\$ (7 )		\$ (7 )
Total liabilities	\$ (7 )		\$ (7 )

## NOTE 3:- OTHER ACCOUNTS RECEIVABLE AND PREPAID EXPENSES

	December 31,	
	2017	2018
Government authorities	\$5,202	\$6,573
Deferred charges and prepaid expenses	4,417	3,186
Financial institutions	5,543	-
Deposits receivable	481	367
Advances to suppliers	467	812

Hedging asset	451	5
Other	491	1,192
	\$17,052	\$12,135

## CERAGON NETWORKS LTD. AND ITS SUBSIDIARIES

## NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

U.S. dollars in thousands (except share data)

## NOTE 4:- INVENTORIES

	December 31,	
	2017	2018
Raw materials	\$12,011	\$15,065
Work in progress	576	374
Finished products	41,577	38,070
	\$54,164	\$53,509

During the year ended December 31, 2016, 2017 and 2018, the Company recorded inventory write-offs for excess inventory and slow-moving inventory in a total amount of \$ 4,503, \$ 3,932 and \$2,814, respectively that have been included in cost of revenues.

As of December 31, 2018, the Company has an outstanding inventory purchase orders with its suppliers in the amount of \$23,922.

## NOTE 5:- PROPERTY AND EQUIPMENT, NET

	December 31,	
	2017	2018
Cost:		
Computers, manufacturing, peripheral equipment	\$100,027	\$111,012
Office furniture and equipment	2,954	2,201
Leasehold improvements	1,148	1,410
	104,129	114,623
Accumulated depreciation:		
Computers, manufacturing, peripheral equipment	70,956	78,317
Office furniture and equipment	2,502	1,856
Leasehold improvements	801	837
	74,259	81,010
Depreciated cost	\$29,870	\$33,613

Depreciation expenses for the years ended December 31, 2016, 2017 and 2018 were \$ 8,389, \$ 7,661 and \$7,758 respectively.

Changes of property and equipment not resulted in cash outflows as of December 31, 2017 and 2018 amounted of \$ 1,508 and \$2,581.

## CERAGON NETWORKS LTD. AND ITS SUBSIDIARIES

## NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

U.S. dollars in thousands (except share data)

## NOTE 6:- INTANGIBLE ASSETS, NET

## a. Intangible assets:

The following table sets forth the components of intangible assets:

	December 31,	
	2017	2018
Original amounts:		
Technology	\$1,225	\$4,509
Software development costs	974	2,067
Intangible assets, net	\$2,199	\$6,576

Technology includes mainly perpetual software licenses to be used in the Company's research and development activities. During 2018, the Company purchased \$ 3,284 technology, out of which \$ 1,834 was not resulted in cash flow outflows as of December 31, 2018. Some of the software license agreements provide a commitment of the Company for royalties payments upon future sales of the related developed products.

<sup>a</sup> Amortization expense for the years ended December 31, 2016, 2017 and 2018 amounted to \$ 1,648, \$ 1,544 and \$0 ,  
<sup>b</sup> respectively.

## NOTE 7:- OTHER ACCOUNTS PAYABLE AND ACCRUED EXPENSES

	December 31,	
	2017	2018
Employees and payroll accruals	\$12,717	\$15,389
Provision for warranty costs	2,023	2,106
Government authorities	3,172	2,450
Accrued expenses	4,682	3,529
Advanced payments from customers	1,629	1,864
Hedging Liability	457	1,033
Other	101	885
	\$24,781	\$27,256

## NOTE 8:- CREDIT LINES

In March 2013, the Company was provided with a revolving Credit Facility by four financial institutions. The Credit Facility was renewed and amended several times during the past years according to Company's needs and financial position.

In March 2018, the Company signed an amendment to the agreement in the frame of which, the Credit Facility was extended by 2 years and 3 months, till June 30, 2020. Furthermore, the amendment includes an additional increase in bank guarantees credit lines of \$19,800, to \$85,000, a decrease in Credit Facility for loans of \$10,000 to \$40,000, a decrease in allowed letter of credit discounting activities with one customer from \$94,000 to \$50,000 and additional \$10,000 of allowed factoring of invoices with another specific customer. The existing \$20,000 receivables factoring permitted under the agreement, has remained unchanged. The amendment also includes reduced fees and interest spread as compared with the March 2017 amendment.

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CERAGON NETWORKS LTD. AND ITS SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

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U.S. dollars in thousands (except share data)

NOTE 8:- CREDIT LINES (Cont.)

As of December 31, 2018 the Company has not utilized any of the \$ 40,000 credit line available for short term loans. During 2018, the credit lines carry interest rates in the range of Libor+2.7% and Libor+3.0%.

The Credit Facility is secured by a floating charge over all Company assets as well as several customary fixed charges on specific assets.

Repayment could be accelerated by the financial institutions in certain events of default including in insolvency events, failure to comply with financial covenants or an event in which a current or future shareholder acquires control (as defined under the Israel Securities Law) of the Company.

The credit agreement contains financial and other covenants requiring that the Company maintains, among other things, minimum shareholders' equity value and financial assets, a certain ratio between its shareholders' equity (excluding total intangible assets) and the total value of its assets (excluding total intangible assets) on its balance sheet, a certain ratio between its net financial debt to each of our working capital and accounts receivable. As of December 31, 2018 and 2017, the Company met all of its covenants.

NOTE 9:- DERIVATIVE INSTRUMENTS

As of December 31, 2017, the Company had outstanding forward exchange contracts designated as cash flow hedge for the acquisition of NIS 38,077 thousands in consideration for \$ 10,743 maturing, in a period of up to one year. As of December 31, 2018, the Company had outstanding forward exchange contracts designated as cash flow hedge for the acquisition of NIS 135,987 thousands in consideration for \$ 37,398 maturing in a period of up to one year.

The Company also enters into forward exchange contracts to hedge a portion of its certain monetary items in the balance sheet, such as trade receivables and trade payables denominated in foreign currencies for a period of up to one month (the "Fair Value Hedging Program"). The purpose of the Company's Fair Value Hedging Program is to protect the fair value of the monetary assets from foreign exchange rates fluctuations. Gains and losses from derivatives related to the Fair Value Hedging Program are not designated as hedging instruments.

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## CERAGON NETWORKS LTD. AND ITS SUBSIDIARIES

## NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

U.S. dollars in thousands (except share data)

## NOTE 9:- DERIVATIVE INSTRUMENTS (Cont.)

	Loss recognized in Statements of comprehensive income	Statement of Operations item	Gain (loss) recognized in consolidated statements of operations Year ended		
	December 31, 2018		December 31, 2016	2017	2018
Derivatives designated as hedging instruments:					
Foreign exchange option and forward contract	\$ (584	) Operating expenses	\$261	\$1,772	\$(1,373)
Derivatives not designated as hedging instruments:					
Foreign exchange forward contracts	-	Financial expenses	(452)	(2,538)	1,172
Total	\$ (584	)	\$(191)	\$(766	) \$(201
	Balance sheet		December 31, 2017	2018	
Derivatives designated as hedging instruments:	"Other account receivables and prepaid expenses"		\$303	\$3	
Foreign exchange forward contracts	"Other account payables and accrued expenses"		\$-	\$(587)	
	"Other comprehensive income (loss)"		\$303	\$(584)	
Derivatives not designated as hedging instruments:					
Foreign exchange forward contracts and other derivatives	"Other receivables and prepaid expenses"		\$148	\$2	
	"Other account payables and accrued expenses"		(457	\$	) \$(446)

## CERAGON NETWORKS LTD. AND ITS SUBSIDIARIES

## NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

U.S. dollars in thousands (except share data)

## NOTE 10:- PENSION LIABILITIES, NET

The Norwegian subsidiary Ceragon Networks AS (formerly "Nera Networks AS") has defined contribution schemes and four unfunded pension plans.

Under the defined contributions scheme Ceragon Networks AS makes a payment to the insurance company who administer the fund on behalf of the employee. Ceragon Networks AS has no liabilities relating to such schemes after the payment to the insurance company. As of December 31, 2018 almost all active employees are in this scheme. The contribution and the corresponding social security taxes are recognized as payroll expenses in the period to which the employee's services are rendered. The defined pension contribution schemes meet the requirements of the law on compulsory occupational pension.

Defined benefit scheme was stopped for admission from December 1, 2007, and persons that were employed after that date were automatically entered into the defined contribution scheme. The schemes give right to defined future benefits. These are mainly dependent on the number of qualifying employment years, salary level at pension age, and the amount of benefits from the national insurance scheme. The commitment related to the pension scheme is covered through an insurance company. As of December 31, 2018, the pension scheme has 0 members.

AFP-scheme - in force from 1 January 2011, the AFP-scheme is a defined benefit multi-enterprise scheme, but is recognized in the accounts as a defined contribution scheme until reliable and sufficient information is available for the group to recognize its proportional share of pension cost, pension liability and pension funds in the scheme. Ceragon Networks AS's liabilities are therefore not recognized as liability in the balance sheet.

The liabilities in respect of Ceragon Networks AS's pension plans have been recalculated based on updated employee numbers as at December 31, 2018. These plans together represent 100% of the PBO of the entire group.

The following tables provide a reconciliation of the changes in the plans' benefits obligation for the year ended December 31, 2017, and the statement of funds status as of December 31, 2018:

	December 31,	
	2017	2018
Change in projected benefit obligation		
Projected benefit obligation at beginning of year	\$2,373	\$2,123
Liability assumed at the acquisition date of Nera		
Service cost	18	16
Interest cost	47	47
Expenses paid	(143 )	(227 )
Exchange rates differences	(124 )	121
Actuarial loss (gain)	(48 )	97
Projected benefit obligation at end of year	\$2,123	\$2,177





## CERAGON NETWORKS LTD. AND ITS SUBSIDIARIES

## NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

U.S. dollars in thousands (except share data)

## NOTE 10:- PENSION LIABILITIES, NET (Cont.)

The assumptions used in the measurement of the Company' benefits obligations as of December 31, 2017 and 2018 are as follows:

	December 31,	
	2017	2018
Weighted-average assumptions		
Discount rate	2.30%	2.60%
Rate of compensation increase	2.50%	2.75%

The amounts reported for net periodic pension costs and the respective benefit obligation amounts are dependent upon the actuarial assumptions used. The Company reviews historical trends, future expectations, current market conditions and external data to determine the assumptions. The discount rate is the covered bond. For purposes of calculating the 2018 net periodic benefit cost and the 2018 benefit obligation, the Company has used a discount rate of 2.60%. The rate of compensation increase is determined by the Company, based upon its long-term plans for such increases.

The following table provides the components of net periodic benefits cost for the years ended December 31, 2017 and 2018:

	December 31,	
	2017	2018
Components of net periodic benefit cost		
Service cost	\$ 18	\$ 16
Interest cost	47	\$ 47
Net periodic benefit cost	\$ 65	\$ 63

Benefit payments are expected to be paid as follows:

	December 31,	
	2017	2018
2018	\$227	\$-
2019	260	180
2020	360	180
2021	189	189
2022 and thereafter	1,087	1,628
	\$2,123	\$2,177

Regarding the policy for amortizing actuarial gains or losses for pension and post-employment plans, the Company has chosen to charge the actuarial gains or losses to statement of operations.

For the years ended December 31, 2016, 2017 and 2018, an actuarial gain (loss) of \$ (204), \$ 48 and \$ (97) respectively, was recognized in statements of income (loss).

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## CERAGON NETWORKS LTD. AND ITS SUBSIDIARIES

## NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

U.S. dollars in thousands (except share data)

## NOTE 11:- COMMITMENTS AND CONTINGENT LIABILITIES

## a. Lease commitments:

The Company and its subsidiaries lease their facilities and motor vehicles under various operating lease agreements that expire on various dates. Aggregate minimum rental commitments under non-cancelable leases at December 31, 2018, are as follows:

2019	5,104
2020	1,331
2021	546
2022	215
2023 and thereafter	120
	7,316

Expenses for lease of facilities for the years ended December 31, 2016, 2017 and 2018 were approximately \$ 4,235, \$ 4,675 and \$ 4,979, respectively.

Expenses for the lease of motor vehicles for the years ended December 31, 2016, 2017 and 2018 were approximately \$ 735, \$ 814 and \$ 862, respectively.

During 2016, 2017 and 2018, the Company received several grants from the Israeli Innovation Authority ("IIA"). The grants require the Company to comply with the requirements of the Research and Development Law, however, the Company is not obligated to pay royalties on sales of products based on technology or know how developed b. from the grants. In a case involving the transfer of technology or know how developed from the grants outside of Israel, the Company may be required to pay royalties related to past sales of products based on the technology or the developed know how. The Company recorded income from IIA grants for the years ended December 31, 2016, 2017 and 2018 in the amount of \$ 2,536, \$ 1,548 and \$ 1,174, respectively.

## c. Charges and guarantees:

As of December 31, 2017 and 2018, the Company provided bank guarantees in an aggregate amount of \$ 43,914 and \$ 72,842 (including bank guarantee disclosed in Note 11d), respectively, with respect to tender offer guarantees, financial guarantees, warranty guarantees and performance guarantees to its customers. In addition, the Company has a collateral deposit in the amount of \$ 941 for outstanding bank guarantee.

In September 2018, the Company signed commercial agreements with Orocom, a new operator in Peru, to provide broadband connectivity in rural regions. The Peruvian Government ("Fitel") chose Orocom for the deployment of d. transport and broadband access networks in three of six regions in Peru. Orocom is owned by a consortium of companies, comprising telecommunications license holders as well as companies with expertise in fiber-based technologies.

After signing the commercial agreements mentioned above and an operating agreement with Orocom and its shareholders, the Company provided, in the second quarter of 2018, bank guarantees amounting to \$29.1 million, on behalf of Orocom to Fitel, to secure the return of a down payment to be received by Orocom, or part of it, in case Orocom fails to meet the down payment related obligations. These bank guarantees came into effect in July 2018, when a down payment of \$29.1 million was received by Orocom. Orocom's down payment related obligations include primarily meeting specifications and timelines as defined in the agreement between Orocom and Fitel, unless justified or otherwise agreed between these parties; using the funds provided by Fitel properly for the purpose of the project; and maintaining certain composition of shareholders in Orocom for at least three years. The Company's bank guarantees may be gradually reduced as the network build-out process progresses. Should Orocom meet its down payment related obligations towards Fitel, the bank guarantees are expected to be returned to the Company by the end of 2019.

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CERAGON NETWORKS LTD. AND ITS SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

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U.S. dollars in thousands (except share data)

NOTE 11:- COMMITMENTS AND CONTINGENT LIABILITIES (Cont.)

Provisions of the operating agreement mentioned above grant the Company certain protective rights in Orocom during the network build-out phase and until the bank guarantees are returned to the Company, as well as recovery rights against Orocom and its shareholders. These protective rights include, among others, two seats in Orocom's board of directors that comprise half of the board seats; a requirement for receipt of consent by all board members to various decisions, including but not limited to, for the approval of any commitment exceeding one hundred thousand dollars; and full access to Orocom's books and records and any other data, including audit rights. Based on the above, Orocom and its shareholders were defined as related companies. For more information see note 17.

e. Litigations:

On January 5, 2015, a motion to approve a purported class action, naming the Company, its CEO and its directors as defendants, was filed with the District Court of Tel-Aviv (Economic Department), on behalf of holders of ordinary shares, including those who purchased shares during the period following the Company's follow on public offering in July 2014 (the "Motion").

The purported class action is based on Israeli law and alleges breaches of duties by the Company and its management on account of false and misleading statements in the Company's SEC filings and public statements, during the period between July and October 2014. The plaintiff's principal claim is that immediately prior to the follow on public offering, the defendants presented misleading guidance concerning the expected financial results for the third quarter of 2014, indicating an anticipated improvement in the rate of gross profit based on orders which were already received by the Company at the time of such presentation. Although the plaintiff admits that, in accordance with the actual results for the third quarter, the Company did meet the guidance as far as revenues were concerned, the actual rate of gross profit turned out to be much lower than the one anticipated. Plaintiff argues that at the time such guidance was presented by the defendants, they already knew, or should have known, that it was incorrect. The plaintiff seeks specified compensatory damages in a sum of up to \$75 million, as well as attorneys' fees and costs.

CERAGON NETWORKS LTD. AND ITS SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

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U.S. dollars in thousands (except share data)

NOTE 11:- COMMITMENTS AND CONTINGENT LIABILITIES (Cont.)

The Motion was served to the Company on January 6, 2015 and the Company filed its response on June 21, 2015. On October 22, 2015, the plaintiff filed a request for discovery of specific documents. The Company filed its response to the plaintiffs' request for discovery on January 25, 2016, and the plaintiffs submitted their response on February 24, 2016. On June 8, 2016, the District Court partially accepted the plaintiff's request for discovery, and ordered the Company to disclose some of the requested documents. The Company's request to appeal this decision was denied by the Supreme Court on October 25, 2016, and the Company disclosed the required documents to the plaintiffs. The plaintiffs filed their reply to the Company's response to the motion on April 2, 2017. In May 2017 the Company filed two requests: the first, requesting to dismiss the Plaintiff's response to the Company's defense, or, alternatively, to allow the Company to respond to it; the second, to precede discussion with regards to the legal question of the governing law. A preliminary hearing was held on May 22, 2017, where the court set dates for response to the Company's above-mentioned requests and for evidence hearings. On July 17, 2017, the court allowed the Company to respond to the plaintiff's response and on July 29, 2017 the Court denied the Company's second request. The Company filed its response to the plaintiff's response on September 18, 2017.

On October 2, 2017, the plaintiff filed a request to summon its Chairman of the Board, Mr. Zisapel, and its CEO, Mr. Palti, to the upcoming evidence hearing. The Company filed its response to this request on October 26, 2017; and the Plaintiff filed its reply to Company's response.

The first evidence hearing took place on November 2, 2017. During this hearing the Company agreed to consider summoning to the second evidence hearing one of the above-mentioned Company's officers, and on November 8, 2017, the Company advised the court that it agrees that Mr. Palti will be summoned to the next evidence hearing. The second and final evidence hearing took place on January 8, 2018, and the court set dates for submitting summaries, which were submitted to the court as follows:

The Plaintiff submitted his summaries on March 21st, 2018;

The Defendants submitted their summaries on June 12th, 2018;

The Plaintiff submitted his reply summaries on September 5th, 2018.

On October 4th, 2018, an interim decision regarding dual listed companies, which corresponds with the Company's arguments in this case, was rendered by the Supreme Court of Israel. In light of this, on October 15th, 2018, the plaintiff asked from court to add a plea to his summaries. Court has approved and gave to the defendants the right to reply. In accordance, the Company's response was submitted on December 4th, 2018. Plaintiff's reply to Company's response was submitted on December 26 th , 2018.

After submission of the summaries and the responses to plaintiff's plea, the court is expected to issue its decision whether to approve the Motion or deny it.

The Company believes that it has a strong defense against the allegations referred to in the Motion and that the District Court should deny it. The Company is not a party to any other material legal proceedings.





CERAGON NETWORKS LTD. AND ITS SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

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U.S. dollars in thousands (except share data)

NOTE 12:- SHAREHOLDERS'  
EQUITY

The ordinary shares of the Company are traded on the Nasdaq Global Select Market, under the symbol "CRNT". Up to December 11, 2017, the ordinary shares of the Company were also traded on the Tel Aviv Stock Exchange (TASE). On September 11, 2017 the Company notified TASE that it decided to voluntarily delist its ordinary shares from trading on TASE. Accordingly, the last trading day of Ceragon's ordinary shares on TASE was December 7, 2017 and the shares were delisted on December 11, 2017. Following the delisting, all of the Company's ordinary shares are traded on the NASDAQ.

a. General:

The ordinary shares entitle their holders to receive notice to participate and vote in general meetings of the Company, the right to share in distributions upon liquidation of the Company, and to receive dividends, if declared.

b. Stock options plans:

In 2003, the Company adopted a share option plan (the "Plan"). Under the Plan, options and RSU's may be granted to officers, directors, employees and consultants of the Company or its subsidiaries. The options vest primarily over <sup>1</sup> four years. The options expire between six to ten years from the date of grant. In December 2012, the Company extended the term of the Plan for an additional period of ten years.

Upon adoption of the Plan, the Company reserved for issuance 8,639,000 ordinary shares in accordance with the respective terms thereof. From the adoption of the plan until December 31, 2018 the board of the company approved to reserve an additional amount of 15,196,688 ordinary shares. Any options or RSU's, which are canceled or forfeited before the expiration date, become available for future grants. As of December 31, 2018, the Company has 1,109,446 Ordinary shares available for future grant under the Plan.

<sup>2</sup> On September 6, 2010, the Company's board of directors amended the Plan so as to enable to grant Restricted share Units ("RSUs") pursuant to such Plan.

## CERAGON NETWORKS LTD. AND ITS SUBSIDIARIES

## NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

U.S. dollars in thousands (except share data)

## NOTE 12:- SHAREHOLDERS' EQUITY (Cont.)

3. The following is a summary of the Company's stock options and RSUs granted among the various plans:

	Year ended December 31, 2018		Weighted average remaining contractual term (in years)	Aggregate intrinsic value
	Number of options	Weighted average exercise price		
Outstanding at beginning of year	7,939,978	\$ 3.61	3.75	\$ 2,839
Granted	1,273,145	3.33		
Exercised	(1,930,244)	1.44		
Forfeited or expired	(531,273 )	6.00		
Outstanding at end of the year	6,751,606	3.99	3.47	7,937
Options exercisable at end of the year	4,150,587	4.97	2.76	4,517
Vested and expected to vest	6,325,305	4.09	3.36	7,501
			Year ended December 31, 2018	Aggregate intrinsic value
			Number of RSUs	
Outstanding at beginning of year			327,093	\$ 648
Granted			186,608	
Exercised			(112,665)	
Forfeited			(24,225 )	
Outstanding at end of the year			376,811	1,424
Vested and expected to vest			264,496	1,000

The Company's options are generally granted at exercise prices which are equal to the average market value of the ordinary shares in the period of 30 trading days prior to the grant date. The weighted average grant date fair value of the options granted during 2016, 2017 and 2018 were \$ 0.78, \$ 1.11 and \$1.79, respectively. The Company granted 186,608 and 316,827 RSUs during 2018 and 2017, respectively. No RSUs were granted during 2016.

The aggregate intrinsic value in the table above represents the total intrinsic value (the difference between the Company's closing stock price on the last trading day of the year and the exercise price, multiplied by the number of in-the-money options) that would have been received by the option holders had all option holders exercised their options on the last day of the year.

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## CERAGON NETWORKS LTD. AND ITS SUBSIDIARIES

## NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

U.S. dollars in thousands (except share data)

## NOTE 12:- SHAREHOLDERS' EQUITY (Cont.)

This amount is impacted by the changes in the fair market value of the Company's shares. Total intrinsic value of options and RSUs exercised during the years ended December 31, 2017 and 2018 were \$ 265 and \$ 5,116, respectively. As of December 31, 2018, there was \$ 2,225 of total unrecognized compensation cost related to non-vested share-based compensation arrangements granted under the Plan. This cost is expected to be recognized over a weighted-average period of 1.00 years.

The following is a summary of the Company's stock options and RSUs granted separated into ranges of exercise price:

Exercise price (range) \$	Options and RSUs outstanding as of December 31, 2018	Weighted average remaining contractual life (years)	Weighted average exercise price \$	Options and RSUs exercisable as of December 31, 2018	Weighted average remaining contractual life (years) for exercisable options)	Weighted average exercise price \$
RSUs 0.0	376,811	-	0.00	-	-	0.00
0.01-2.00	1,899,640	2.74	1.20	1,209,876	2.58	1.19
2.01-4.00	3,070,807	4.64	2.79	1,159,552	3.79	2.89
4.01-6.00	478,501	2.10	4.97	478,501	2.10	4.97
6.01-8.00	31,000	3.72	6.50	31,000	3.72	6.50
8.01-10.00	643,574	2.60	9.07	643,574	2.60	9.07
10.01-13.04	628,084	1.85	12.36	628,084	1.85	12.36
	7,128,417			4,150,587		

The total equity-based compensation expense related to all of the Company's equity-based awards, recognized for the years ended December 31, 2016, 2017 and 2018, was comprised as follows:

	Year ended December 31,		
	2016	2017	2018
Cost of revenues	\$30	\$54	\$42
Research and development	151	229	313
Selling and marketing	369	292	640
General and administrative	521	628	985
Total share-based compensation expenses	\$1,071	\$1,203	\$1,980

c. Dividends:

In the event that cash dividends are declared in the future, such dividends will be paid in NIS or in foreign currency subject to any statutory limitations. The Company does not intend to pay cash dividends in the foreseeable future.

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CERAGON NETWORKS LTD. AND ITS SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

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U.S. dollars in thousands (except share data)

NOTE 13:- TAXES ON INCOME

a. Israeli taxation:

1. Measurement of taxable income:

The Company has elected to file its tax return under the Israeli Income Tax Regulations 1986 (Principles Regarding the Management of Books of Account of Foreign Invested Companies and Certain Partnerships and the Determination of Their Taxable Income). Accordingly, starting tax year 2003, results of operations in Israel are measured in terms of earnings in U.S. dollars.

2. Tax benefits under the Law for the Encouragement of Capital Investments, 1959 (the "Law"):

According to the Law, the Company is entitled to various tax benefits by virtue of the " Approved Enterprise " and/or "Benefited Enterprise " status granted to part of their enterprises, as implied by this Law. The principal benefits by virtue of the Law are:

According to the provisions of the Law, the Company has chosen to enjoy the "Alternative" track. Under this track, the Company is tax exempt in the first two years of the benefit period and subject to tax at the reduced rate of 10%-25% for the remaining benefit period. The benefit period under Approved Enterprise starts with the first year the benefited enterprise earns taxable income, provided that 14 years have not passed since the approval was granted and 12 years have not passed since the enterprise began operating. Under the Benefited Enterprise, the benefit period starts at the later of the year elected and the first year the Company earns taxable income provided that 12 years have not passed since the beginning of the year of election. The respective benefit period has not yet begun, as no taxable income was generated.

Generally, a company that is Abundant in Foreign Investment (owned by at least 74% foreign shareholders and has undertaken to invest a minimum sum of \$20 million in the Beneficiary Enterprise) is entitled to an extension of the benefits period by an additional five years

The tax benefits under the Approved Enterprise and Benefited Enterprise are conditional upon the fulfillment of the conditions stipulated by the Law, regulations published and the letters of approval for the investments in the approved enterprises. Non-compliance with the conditions may cancel all or part of the benefits and refund of the amount of the benefits, including interest.

The Company has three capital investment programs that have been granted Approved Enterprise status, under the Law and two programs under Benefited Enterprise status pursuant to Amendment 60.

As of January 1<sup>st</sup> 2018, the 14 years have passed for the three Approved Enterprise programs.

CERAGON NETWORKS LTD. AND ITS SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

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U.S. dollars in thousands (except share data)

NOTE 13:- TAXES ON INCOME (Cont.)

The Company has elected 2006 and 2009 as election years as a Benefited Enterprise.

Income from sources other than the "Approved Enterprise" and "Benefited Enterprise" during the benefit period will be subject to the tax at the regular tax rate.

In December 2016, the Knesset passed an additional amendment to the Law which provides for additional benefits to Preferred Technological Enterprises by reducing the tax rate on preferred Technological Enterprise income (as such is defined in Amendment 73) to 12% (the "Amendment"). This Amendment came into effect in May 2017 when the Minister of Finance promulgated the regulations for its implementation. The Company has evaluated the effect of the adoption of the Amendment on its financial statements, and as of the date of the approval of the financial statements, the Company did not apply the Amendment. The Company may change its position in the future.

3. Tax benefits under the Law for the Encouragement of Industry (Taxes), 1969:

The Encouragement Law provides several tax benefits for industrial companies. An industrial company is defined as a company resident and located in Israel, at least 90% of the income of which in a given tax year exclusive of income from specified Government loans, capital gains, interest and dividends, is derived from an industrial enterprise owned by it. An industrial enterprise is defined as an enterprise whose major activity in a given tax year is industrial production activity.

Management believes that the Company is currently qualified as an "industrial company" under the Encouragement Law and, as such, enjoys tax benefits, including: (1) deduction of purchase of know-how and patents and/or right to use a patent over an eight-year period; (2) the right to elect, under specified conditions, to file a consolidated tax return with additional related Israeli industrial companies and an industrial holding company; (3) accelerated depreciation rates on equipment and buildings; and (4) expenses related to a public offering on the Tel-Aviv Stock Exchange and on recognized stock markets outside of Israel, are deductible in equal amounts over three years.

Eligibility for benefits under the Encouragement Law is not subject to receipt of prior approval from any Governmental authority. No assurance can be given that the Israeli tax authorities will agree that the Company qualifies, or, if the Company qualifies, that the Company will continue to qualify as an industrial company or that the benefits described above will be available to the Company in the future.

4. Tax rates:

Taxable income of Israeli companies was subject to tax at the rate - 23% in 2018 and 24% in 2017.

## CERAGON NETWORKS LTD. AND ITS SUBSIDIARIES

## NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

U.S. dollars in thousands (except share data)

## NOTE 13:- TAXES ON INCOME (Cont.)

In December 2016 the Knesset approved amendment 235 to the Income Tax Ordinance which further reduces the corporate tax rate to 24% in 2017 and 23% in 2018 and thereafter. The effective tax rate payable by a company which is taxed under the Investment Law may be considerably lower (see also note 13.a2 above).

Israeli corporations are generally taxed at the corporate income tax rate on their capital gains.

## 5. Tax Reform in U.S:

On December 22, 2017, new federal tax legislation was enacted in the United States (referred to as the Tax Cuts and Jobs Act). The Tax Cuts and Jobs Act reduces the federal corporate income tax rate to 21% from 35% effective January 1, 2018. The rate change resulted in a reduction of the Company's net deferred tax assets of \$153 and a corresponding deferred income tax expense in 2017. The Company's federal income tax expense for tax years beginning January 1, 2018 will be based on the newly enacted 21% rate.

Accounting Standards Codification Topic 740, Income Taxes ("ASC 740") requires companies to account for the tax effects of changes in income tax rates and laws in the period in which legislation is enacted (December 22, 2017). ASC 740 does not specifically address accounting and disclosure guidance in connection with the income tax effects of the TCJA. Consequently, on December 22, 2017, the Securities and Exchange Commission staff issued Staff Accounting Bulletin No. 118 ("SAB 118"), to address the application of ASC 740 in the reporting period that includes the date the TCJA was enacted. SAB 118 allows companies a reasonable period of time to complete the accounting for the income tax effects of the TCJA.

b. The income tax expense (benefit) for the years ended December 31, 2016, 2017 and 2018 consisted of the following:

	Year ended December 31,		
	2016	2017	2018
Current	\$1,418	\$1,200	\$3,350
Deferred	343	497	(6,601)
	\$1,761	\$1,697	\$(3,251)
Domestic (Israel)	\$968	\$1,533	\$(5,919)
Foreign	793	164	2,668
	\$1,761	\$1,697	\$(3,251)





## CERAGON NETWORKS LTD. AND ITS SUBSIDIARIES

## NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

U.S. dollars in thousands (except share data)

## NOTE 13:- TAXES ON INCOME (Cont.)

## c. Deferred income taxes:

Deferred income taxes reflect the net tax effects of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for income tax purposes.

Significant components of the Company's deferred tax assets and liabilities are as follows:

	December 31,	
	2017	2018
Deferred tax assets:		
Net operating loss carry forward	\$76,570	\$75,755
Temporary differences mainly relating to Research and Development, reserves and allowances	31,566	24,875
Deferred tax asset before valuation allowance	108,136	100,630
Valuation allowance	(107,148)	(93,154)
Deferred tax asset	988	7,476
Deferred tax liabilities:		
Other temporary differences	(141)	(28)
Deferred tax asset, net	\$847	\$7,448

In assessing the realization of deferred tax assets, management considers whether it is more likely than not that all or some portion of the deferred tax assets will not be realized in each tax jurisdiction. The ultimate realization of the deferred tax assets is dependent upon the generation of future taxable income during the periods in which temporary differences are deductible and net operating losses are utilized. Based on consideration of these factors, In 2018, the Company recorded a tax asset of \$7,200 reflecting tax benefit in Israel due to expected utilization of net operating losses in future years.

## d. Net operating loss carry forward and capital loss:

As of December 31, 2018, the Company has accumulated net operating losses and capital loss for Israeli income tax purposes as of December 31, 2018 in the amount of approximately \$ 190,735 and \$ 7,538, respectively. The net operating losses may be carried forward and offset against taxable income in the future for an indefinite period.

As of December 31, 2018, the Company's Norwegian subsidiary had a net operating loss carry forward of approximately \$ 15,392 that can be carried forward. The net operating losses may be carried forward and offset against taxable income in the future for an indefinite period.



## CERAGON NETWORKS LTD. AND ITS SUBSIDIARIES

## NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

U.S. dollars in thousands (except share data)

## NOTE 13:- TAXES ON INCOME (Cont.)

As of December 31, 2018 the Company's Brazilian subsidiary had a net operating loss carryforward of approximately \$ 43,805 that can be carried forward. The net operating losses may be carried forward and offset against taxable income in the future for an indefinite period. The offset is limited to a maximum 30% of the annual taxable income.

e. Income (Loss) before taxes is comprised as follows:

	Year ended December 31,		
	2016	2017	2018
Domestic	\$(1,301 )	\$13,145	\$17,921
Foreign	14,491	4,112	1,874
	\$13,190	\$17,257	\$19,795

f. Reconciliation of the theoretical tax expense to the actual tax expense:

Reconciliation between the theoretical tax expense, assuming all income is taxed at the statutory tax rate applicable to income of the Company and the actual tax expense as reported in the statements of operations is as follows:

	Year ended December 31,					
	2016		2017		2018	
Income before taxes as reported in the consolidated statements of operations	\$13,190		\$17,257		\$19,795	
Statutory tax rate	25	%	24	%	23	%
Theoretical tax income on the above amount at the Israeli statutory tax rate	\$3,298		\$4,142		\$4,553	
Non-deductible expenses	467		290		1,299	
Non-deductible expenses related to employee stock options	268		289		376	
Changes in tax rate	8,900		124		179	
Losses in respect of which no deferred taxes were generated (including changes in valuation allowance)	(10,055)		(3,225 )		(4,068 )	
Recognition of deferred taxes during the year, for which valuation allowance was provided in prior years					(7,200 )	
Other	(1,117 )		77		1,610	
Actual tax expense (benefit)	\$1,761		\$1,697		\$(3,251 )	



## CERAGON NETWORKS LTD. AND ITS SUBSIDIARIES

## NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

U.S. dollars in thousands (except share data)

## NOTE 13:- TAXES ON INCOME (Cont.)

g. The Company adopted the provisions of ASC topic 740-10, "Income Taxes".

A reconciliation of the beginning and ending balances of the total amounts of unrecognized tax benefits is as follows:

	December 31,	
	2017	2018
Uncertain tax positions, beginning of year	\$4,686	\$2,160
Decreases in tax positions for prior years	(3,880)	(304 )
Increases in tax positions for prior years	49	18
Increase in tax position for current year	1,305	499
Uncertain tax positions, end of year	\$2,160	\$2,373

The Company has further accrued \$ 84 due to interest and penalty related to uncertain tax positions as of December 31, 2018.

## NOTE 14:- REVENUES

On January 1, 2018, the Company adopted ASC Topic 606-10 using the modified retrospective method and applied the standard to those contracts which were not completed as of January 1, 2018. Results for reporting periods beginning after January 1, 2018 are presented under Topic 606-10, while prior period amounts are not adjusted and continue to be reported in accordance with the historic accounting under Topic 605.

The Company recognized the cumulative effect of initially adopting Topic 606-10 as an adjustment to the opening balance of retained earnings as of January 1, 2018. The most significant impact of the standard on the Company's consolidated financial statements, relates to completion of its performance obligations in accordance with variable considerations, which primarily contributed to the adjustment to the opening balance of retained earnings as well as the impact of adoption disclosed in the tables below.

The cumulative effect of the changes made to the consolidated balance sheet as of January 1, 2018 for the adoption of Topic 606-10 were as follows:

	December 31, 2017	Adjustments	January 1, 2018
Trade receivables	\$113,719	\$ 117	\$113,836
Trade payables	\$75,476	\$ 47	\$75,523
Accumulated deficits	\$(249,871)	\$ 70	\$(249,801)



## CERAGON NETWORKS LTD. AND ITS SUBSIDIARIES

## NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

U.S. dollars in thousands (except share data)

## NOTE 14:- REVENUES (Cont.)

In accordance with Topic 606-10, the disclosure of the impact of adoption on the consolidated balance sheet as of December 31, 2018 was as follows:

	As Reported	Impact of Adoption	Amounts under Topic 605
Consolidated Balance Sheet			
Trade receivables	\$123,451	\$ (741 )	\$122,710
Trade payables	\$78,892	\$ (84 )	\$78,808
Accumulated deficits	\$(233,955)	\$ (657 )	\$(234,612)

The following table summarizes the impacts of adopting Topic 606-10 on our consolidated statements of income during the twelve months ended December 31, 2018:

	As Reported	Impact of Adoption	Amounts under Topic 605
Consolidated Statements of Income			
Revenue	\$343,874	\$ (741 )	\$343,133
Cost of Sales	\$227,705	\$ (84 )	\$227,621
Gross margin	\$116,169	\$ (657 )	\$115,512

The Company records contract liabilities as deferred revenues, when it receives payments from customers before performance obligations have been performed and satisfied. The Company recognizes deferred revenues as revenues in the income statement once performance obligations have been performed and satisfied. The balance of deferred revenues approximates the aggregate amount of the transaction price allocated to the unsatisfied performance obligations at the end of reporting period.

Because the performance obligations are part of a contracts that have an original expected duration of one year or less, all performance obligations in the Company's contracts with customers, other than post-contract customer support, the Company has elected to apply the optional exemption and is not required to disclose the aggregate amount of the transaction price allocated to performance obligations that are unsatisfied or partially unsatisfied at the end of the reporting period.



## CERAGON NETWORKS LTD. AND ITS SUBSIDIARIES

## NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

U.S. dollars in thousands (except share data)

## NOTE 14:- REVENUES (Cont.)

The following table presents the significant changes in the deferred revenue balance during the twelve months ended December 31, 2018:

	Twelve months ended December 31, 2018
Balance, beginning of the period	\$ 5,193
New performance obligations	12,746
Reclassification to revenue as a result of satisfying performance obligations	(14,066 )
Balance, end of the period	\$ 3,873

## NOTE 15:- SEGMENTS, CUSTOMERS AND GEOGRAPHIC INFORMATION

The Company applies ASC topic 280, "Segment Reporting", ("ASC 820"). The Company operates in one reportable a. segment (see note 1a for a brief description of the Company's business). The total revenues are attributed to geographic areas based on the location of the end customer.

b. The following tables present total revenues for the years ended December 31, 2016, 2017 and 2018 and long-lived assets as of December 31, 2016, 2017 and 2018:

	Year ended December 31,		
	2016	2017	2018
Revenues from sales to unaffiliated customers:			
North America	\$40,236	\$39,498	\$41,384
Europe	43,457	45,448	38,919
Africa	19,872	12,111	23,690
Asia-Pacific and Middle East	29,743	44,983	47,320
India	80,247	130,042	131,201
Latin America	80,086	59,951	61,360
	\$293,641	\$332,033	\$343,874
Property and equipment, net, by geographic areas:			
Israel	\$23,162	\$25,419	\$28,494

Others	4,398	4,451	5,119
	\$27,560	\$29,870	\$33,613

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## CERAGON NETWORKS LTD. AND ITS SUBSIDIARIES

## NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

U.S. dollars in thousands (except share data)

## NOTE 15:- SEGMENTS, CUSTOMERS AND GEOGRAPHIC INFORMATION (Cont.)

## c. Major customer data as a percentage of total revenues:

In 2018, the Company had revenues from a single customer that accounted for approximately 21.1% and from a customer that represents group of affiliated companies equaling 19.6% of total revenues. In 2017, the Company had revenues from a single customer that accounted for approximately 27.3% and from a customer that represents group of affiliated companies equaling 12.3% of total revenues. In 2016, the Company had revenue from a single customer that accounted for approximately 16.6% of total revenues.

## NOTE 16:- SELECTED STATEMENTS OF OPERATIONS DATA

## a. Financial expenses, net:

	Year ended December 31,		
	2016	2017	2018
Financial income:			
Interest on deposits	\$242	\$126	\$111
Foreign currency translation differences and derivatives (*)	966	2,522	3,981
	1,208	2,648	4,092
Financial expenses:			
Bank charges and interest on loans	(3,794)	(4,830)	(4,597 )
Foreign currency translation differences and derivatives	(3,717)	(3,707)	(5,844 )
	(7,511)	(8,537)	(10,441)
	\$(6,303)	\$(5,889)	\$(6,349 )

During 2016 and 2018 the Company recorded \$ 907 and \$ 969 income (respectively) upon collection of trade (\*)receivables balances from customers in Venezuela at a rate which was higher than the rate it could collect these receivables previously

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## CERAGON NETWORKS LTD. AND ITS SUBSIDIARIES

## NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

U.S. dollars in thousands (except share data)

## NOTE 16:- SELECTED STATEMENTS OF OPERATIONS DATA (Cont.)

## b. Net income per share:

The following table sets forth the computation of basic and diluted net earnings per share:

	Year ended December 31,		
	2016	2017	2018
Numerator:			
Numerator for basic and diluted net income per share - income available to shareholders of Ordinary shares	\$ 11,429	\$ 15,560	\$ 23,046
Denominator:			
Denominator for basic net income per share - weighted average number of shares	77,702,788	77,916,912	78,579,013
Effect of dilutive securities:			
Employee stock options and RSU	910,740	2,025,441	2,442,514
Denominator for diluted net income per share - adjusted weighted average number of shares	78,613,528	79,942,353	81,021,527

## NOTE 17:- RELATED PARTY BALANCES AND TRANSACTIONS

Related party balances and transactions are with related companies and principal shareholder. Yehuda Zisapel is a principal shareholder of the Company. Zohar Zisapel is the Chairman of the Board of Directors of the Company. Yehuda and Zohar Zisapel are brothers who do not have a voting agreement between them. Jointly or severally, they are also founders, directors and principal shareholders of several other companies that are known as the RAD-BYNET group.

Members of the RAD-BYNET group provide the Company on an as-needed basis with information systems infrastructure, administrative services, medical insurance, as well as in connection with logistics services, the Company reimburses each company for its costs in providing these services. The aggregate amount of these expenses was approximately \$ 1,668, \$ 1,857 and \$ 1,856 in 2016, 2017 and 2018, respectively.

The Company leases its offices in Israel from real estate holding companies controlled by Yehuda and Zohar Zisapel. The leases of this facility will expire end of December 2019. Subsequent to balance sheet date, the agreement was extended until end of December 2020.

The aggregate amount of rent and maintenance expenses related to these properties was approximately \$ 1,963 in 2016, \$ 1,849 in 2017 and \$1,960 in 2018.



## CERAGON NETWORKS LTD. AND ITS SUBSIDIARIES

## NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

U.S. dollars in thousands (except share data)

## NOTE 17:- RELATED PARTY BALANCES AND TRANSACTIONS (Cont.)

The Company has an OEM arrangement with RADWIN, a member of RAD-BYNET group, according to which the Company purchases RADWIN products that are then resold to the Company's customers. In addition, the Company purchases certain inventory components from other members of the RAD-BYNET group, which are integrated into its products. The aggregate purchase price of these components was approximately \$ 2,866, \$ 1,325 and \$ 78 for the years ended December 31, 2016, 2017 and 2018, respectively.

The Company purchases certain property and equipment from members of the RAD-BYNET group, the aggregate purchase price of these assets was approximately \$ 1,019, \$ 224 and \$ 148 for the years ended December 31, 2016, 2017 and 2018, respectively.

As part of the commercial agreements with Orocom for the Fitel project in Peru, the Company has two seats in Orocom's board of directors, which comprise half of Orocom's board seats, as well as other protective rights in Orocom (for more information see note 11 above). As a result, Orocom and its shareholders were defined as related companies of Ceragon. During 2018, Amitel Perú Telecomunicaciones S.A.C. ("Amitel") - one of Orocom's shareholders and a partner in the Fitel project – won a tender of Ceragon for the provision of site surveys services in the sum of approximately \$ 490.

In December 2018, the company purchased 11% of the share capital of Compass for a consideration of \$ 833. (see note 1b).

Transactions with related parties:

	Year ended December 31,		
	2016	2017	2018
Revenues	\$95	\$173	\$3,336
Cost of revenues	\$3,561	\$2,160	\$1,111
Research and development expenses	\$1,093	\$1,063	\$1,008
Selling and marketing expenses	\$733	\$813	\$771
General and administrative expenses	\$1,109	\$995	\$1,067
Purchase of property and equipment	\$1,019	\$224	\$148

Balances with related parties:

December 31,  
2017 2018

Trade payables, other accounts payable and accrued expenses	\$363	\$2,077
Trade Receivables	\$49	\$1,733

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