

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-Q

(Mark One)

QUARTERLY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES AND EXCHANGE ACT OF 1934
For the quarterly period ended December 28, 2019

or

TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES AND EXCHANGE ACT OF 1934
For the transition period from _____ to _____

Commission File Number: 000-02382



MTS SYSTEMS CORPORATION

(Exact name of Registrant as specified in its charter)

Minnesota

(State or other jurisdiction
of incorporation or organization)

41-0908057

(I.R.S. Employer Identification No.)

14000 Technology Drive

Eden Prairie, Minnesota

(Address of principal executive offices)

55344

(Zip Code)

Registrant's telephone number, including area code: (952) 937-4000

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

<u>Title of each class</u>	<u>Trading Symbol(s)</u>	<u>Name of each exchange on which registered</u>
Common stock, \$0.25 par value	MTSC	The Nasdaq Stock Market LLC

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 (§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, a smaller reporting company or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer Accelerated filer Emerging growth company

Non-accelerated filer Smaller reporting company

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

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

As of January 30, 2020, there were 19,185,520 shares of common stock outstanding.

MTS Systems Corporation
Quarterly Report on Form 10-Q
For the Three Months Ended December 28, 2019

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PART I – FINANCIAL INFORMATION**Item 1. Financial Statements****MTS SYSTEMS CORPORATION****Consolidated Balance Sheets**

(in thousands, except per share data)

	December 28, 2019	September 28, 2019
	(Unaudited)	(Note)
Assets		
Current assets		
Cash and cash equivalents	\$ 64,071	\$ 57,937
Accounts receivable, net of allowance for doubtful accounts of \$5,564 and \$5,963, respectively	131,285	121,260
Unbilled accounts receivable, net	67,368	80,331
Inventories, net	177,017	167,199
Prepaid expenses and other current assets	21,075	23,761
Total current assets	460,816	450,488
Property and equipment, net	101,992	101,083
Goodwill	429,838	429,039
Intangible assets, net	306,134	306,585
Other long-term assets	25,195	3,553
Deferred income taxes	5,444	7,229
Total assets	\$ 1,329,419	\$ 1,297,977
Liabilities and Shareholders' Equity		
Current liabilities		
Short-term borrowings	\$ 30,000	\$ —
Current maturities of long-term debt, net	27,494	27,969
Accounts payable	46,113	46,849
Accrued payroll and related costs	34,845	46,760
Advance payments from customers	66,142	70,520
Accrued warranty costs	4,119	3,541
Accrued income taxes	4,078	7,077
Accrued dividends	5,704	5,695
Other accrued liabilities	51,948	43,165
Total current liabilities	270,443	251,576
Long-term debt, less current maturities, net	483,216	484,648
Deferred income taxes	39,907	41,531
Non-current accrued income taxes	5,034	4,414
Defined benefit pension plan obligation	16,268	16,585
Other long-term liabilities	25,803	15,164
Total liabilities	840,671	813,918
Shareholders' Equity		
Common stock, \$0.25 par value; 64,000 shares authorized: 19,156 and 19,124 shares issued and outstanding as of December 28, 2019 and September 28, 2019, respectively	4,789	4,781
Additional paid-in capital	183,948	182,422
Retained earnings	314,887	315,329
Accumulated other comprehensive income (loss)	(14,876)	(18,473)
Total shareholders' equity	488,748	484,059
Total liabilities and shareholders' equity	\$ 1,329,419	\$ 1,297,977

Note: The Consolidated Balance Sheet as of September 28, 2019 has been derived from the audited consolidated financial statements at that date.

The accompanying Notes to Consolidated Financial Statements (Unaudited) are an integral part of these consolidated financial statements.

MTS SYSTEMS CORPORATION**Consolidated Statements of Income (Unaudited)**

(in thousands, except per share data)

	Three Months Ended	
	December 28, 2019	December 29, 2018
Revenue		
Product	\$ 178,858	\$ 175,078
Service	26,985	28,103
Total revenue	205,843	203,181
Cost of Sales		
Product	111,639	108,168
Service	17,595	16,708
Total cost of sales	129,234	124,876
Gross profit	76,609	78,305
Operating expenses		
Selling and marketing	32,719	32,089
General and administrative	21,693	21,078
Research and development	7,039	7,172
Total operating expenses	61,451	60,339
Income from operations	15,158	17,966
Interest income (expense), net	(8,272)	(6,818)
Other income (expense), net	(431)	49
Income before income taxes	6,455	11,197
Income tax provision (benefit)	1,149	696
Net income	\$ 5,306	\$ 10,501
Earnings per share		
<i>Basic</i>		
Earnings per share	\$ 0.28	\$ 0.55
Weighted average common shares outstanding	19,146	19,216
<i>Diluted</i>		
Earnings per share	\$ 0.27	\$ 0.54
Weighted average common shares outstanding	19,369	19,556
Dividends declared per share	\$ 0.30	\$ 0.30

The accompanying Notes to Consolidated Financial Statements (Unaudited) are an integral part of these consolidated financial statements.

MTS SYSTEMS CORPORATION**Consolidated Statements of Comprehensive Income (Unaudited)**

(in thousands)

	Three Months Ended	
	December 28, 2019	December 29, 2018
Net income	\$ 5,306	\$ 10,501
Other comprehensive income (loss), net of tax		
Foreign currency translation gain (loss) adjustments	3,547	(1,503)
Derivative instruments		
Unrealized net gain (loss)	(114)	(1,416)
Net (gain) loss reclassified to earnings	(250)	(914)
Defined benefit pension plan		
Unrealized net gain (loss)	384	(1,545)
Net (gain) loss reclassified to earnings	212	96
Currency exchange rate gain (loss)	(182)	115
Other comprehensive income (loss)	3,597	(5,167)
Comprehensive income (loss)	\$ 8,903	\$ 5,334

The accompanying Notes to Consolidated Financial Statements (Unaudited) are an integral part of these consolidated financial statements.

MTS SYSTEMS CORPORATION**Consolidated Statements of Shareholders' Equity (Unaudited)**

(in thousands)

	Three Months Ended December 28, 2019					
	Common Stock		Additional Paid-In Capital	Retained Earnings	Accumulated Other Comprehensive Income (Loss)	Total Shareholders' Equity
	Shares Issued	Amount				
Balance, September 28, 2019	19,124	\$ 4,781	\$ 182,422	\$ 315,329	\$ (18,473)	\$ 484,059
Total comprehensive income	—	—	—	5,306	3,597	8,903
Exercise of stock options	1	—	41	—	—	41
Stock-based compensation	49	12	2,316	—	—	2,328
Common stock purchased and retired	(18)	(4)	(831)	—	—	(835)
Dividends, \$0.30 per share	—	—	—	(5,748)	—	(5,748)
Balance, December 28, 2019	19,156	\$ 4,789	\$ 183,948	\$ 314,887	\$ (14,876)	\$ 488,748

	Three Months Ended December 29, 2018					
	Common Stock		Additional Paid-In Capital	Retained Earnings	Accumulated Other Comprehensive Income (Loss)	Total Shareholders' Equity
	Shares Issued	Amount				
Balance, September 29, 2018	17,856	\$ 4,464	\$ 171,407	\$ 300,585	\$ 1,476	\$ 477,932
Total comprehensive income	—	—	—	10,501	(5,167)	5,334
Cumulative effect of accounting change	—	—	—	(6,227)	—	(6,227)
Exercise of stock options	—	—	38	—	—	38
Stock-based compensation	23	6	1,974	—	—	1,980
Common stock purchased and retired	(7)	(2)	(354)	—	—	(356)
Dividends, \$0.30 per share	—	—	—	(5,366)	—	(5,366)
Balance, December 29, 2018	17,872	\$ 4,468	\$ 173,065	\$ 299,493	\$ (3,691)	\$ 473,335

The accompanying Notes to Consolidated Financial Statements (Unaudited) are an integral part of these consolidated financial statements.

MTS SYSTEMS CORPORATION**Consolidated Statements of Cash Flows (Unaudited)**

(in thousands)

	Three Months Ended	
	December 28, 2019	December 29, 2018
Cash Flows from Operating Activities		
Net income	\$ 5,306	\$ 10,501
Adjustments to reconcile net income to net cash provided by (used in) operating activities		
Stock-based compensation	2,167	1,794
Fair value adjustment to acquired inventory	540	445
Net periodic pension benefit cost	462	292
Depreciation	5,662	5,144
Amortization	4,785	3,816
(Gain) loss on sale or disposal of property and equipment	612	161
Amortization of debt issuance costs	867	1,060
Deferred income taxes	66	(1,258)
Bad debt provision (recovery), net	(460)	136
Changes in operating assets and liabilities		
Accounts receivable and unbilled accounts receivable	4,983	9,083
Inventories, net	(9,716)	(15,788)
Prepaid expenses	(177)	(2,288)
Accounts payable	913	(2,803)
Accrued payroll and related costs	(12,410)	(10,759)
Advance payments from customers	(7,512)	3,265
Accrued warranty costs	572	(185)
Other assets and liabilities	(2,403)	8,015
Net Cash Provided by (Used in) Operating Activities	(5,743)	10,631
Cash Flows from Investing Activities		
Purchases of property and equipment	(10,572)	(3,773)
Proceeds from sale of property and equipment	—	10
Purchases of business, net of acquired cash	—	(78,032)
Other	—	(285)
Net Cash Provided by (Used in) Investing Activities	(10,572)	(82,080)
Cash Flows from Financing Activities		
Proceeds from issuance of long-term debt	—	80,391
Payment of long-term debt	(1,283)	(1,286)
Payment of debt issuance costs for long-term debt	(88)	—
Payment of debt component of tangible equity units	—	(2,388)
Payment of debt issuance costs for revolving credit facility	(564)	(445)
Receipts under short-term borrowings	50,000	25,000
Payments under short-term borrowings	(20,000)	(25,000)
Cash dividends	(5,739)	(5,359)
Proceeds from exercise of stock options and employee stock purchase plan	41	38
Payments to purchase and retire common stock	(835)	(356)
Net Cash Provided by (Used in) Financing Activities	21,532	70,595
Effect of Exchange Rate Changes on Cash and Cash Equivalents	917	(512)
Cash and Cash Equivalents		
Increase (decrease) in cash and cash equivalents during the period	6,134	(1,366)
Cash and cash equivalents balance, beginning of period	57,937	71,804
Cash and cash equivalents balance, end of period	\$ 64,071	\$ 70,438
Supplemental Disclosures		
Cash paid during the period for		
Interest	\$ 1,918	\$ 5,292
Income taxes	2,069	2,006
Non-cash investing and financing activities		
Dividends declared not yet paid	5,704	5,319

The accompanying Notes to Consolidated Financial Statements (Unaudited) are an integral part of these consolidated financial statements.

MTS SYSTEMS CORPORATION

Notes to Consolidated Financial Statements (Unaudited)

(Dollars and shares in thousands, unless otherwise noted)

NOTE 1 BASIS OF PRESENTATION

The consolidated financial statements include the accounts of MTS Systems Corporation and its wholly owned subsidiaries. Significant intercompany account balances and transactions have been eliminated.

The terms "MTS," "we," "us," "the Company" or "our" in this Quarterly Report on Form 10-Q, unless the context otherwise requires, refer to MTS Systems Corporation and its wholly owned subsidiaries.

We have prepared the interim unaudited consolidated financial statements included herein pursuant to the rules and regulations of the United States (U.S.) Securities and Exchange Commission (SEC). The information furnished in these consolidated financial statements includes normal recurring adjustments and reflects all adjustments that are, in our opinion, necessary for a fair presentation of such financial statements. The consolidated financial statements are prepared in accordance with U.S. Generally Accepted Accounting Principles (GAAP). GAAP requires us to make estimates and assumptions that affect amounts reported. Certain information and footnote disclosures normally included in financial statements prepared in accordance with GAAP have been condensed or omitted pursuant to SEC rules and regulations. The accompanying consolidated financial statements should be read in conjunction with the audited consolidated financial statements and notes thereto included in our Annual Report on Form 10-K for the fiscal year ended September 28, 2019 filed with the SEC. Interim results of operations for the first fiscal quarter ended December 28, 2019 are not necessarily indicative of the results to be expected for the full fiscal year.

We have a 5-4-4 week, quarterly accounting cycle with our fiscal year ending on the Saturday closest to September 30. Fiscal year 2020 ending on October 3, 2020 will consist of 53 weeks. Fiscal year 2019 ended on September 28, 2019 consisted of 52 weeks.

Changes to Significant Accounting Policies

The following accounting policies have been updated since our fiscal year 2019 Annual Report on Form 10-K.

Leases

As described in Note 2, we adopted Accounting Standards Update (ASU) No. 2016-02, *Leases (Topic 842)*, followed by related amendments, on September 29, 2019 under the modified retrospective transition method. Our new lease accounting policy and disclosures related to this guidance are included in Note 5.

NOTE 2 RECENTLY ISSUED ACCOUNTING PRONOUNCEMENTS

In June 2016, the FASB issued ASU No. 2016-13, *Financial Instruments—Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments*, followed by related amendments, which changes the accounting for credit losses on instruments measured at amortized cost by adding an impairment model that is based on expected losses rather than incurred losses. An entity will recognize as an allowance its estimate of expected credit losses, which is believed to result in more timely recognition of such losses as the standard eliminates the probable initial recognition threshold. Adoption of the standard is required for annual periods beginning after December 15, 2019, including interim periods within that annual period, which is our fiscal year 2021. The new guidance is required to be adopted using a modified retrospective approach with a cumulative-effect adjustment to retained earnings as of the beginning of the first reporting period of adoption. We have not yet evaluated the impact the adoption of this guidance may have on our financial condition, results of operations or disclosures.

In August 2018, the FASB issued ASU No. 2018-13, *Fair Value Measurements (Topic 820): Disclosure Framework—Changes to the Disclosure Requirements for Fair Value Measurement*, which eliminates, amends and adds disclosure requirements for fair value measurements. The standard is required to be adopted for annual periods beginning after December 15, 2019, including interim periods within that annual period, which is our fiscal year 2021. Certain disclosures in the new guidance are to be applied using a retrospective approach while other disclosures are to be applied using a prospective approach. Early adoption is permitted. We have not yet evaluated the impact the adoption of this guidance may have on our financial condition, results of operations or disclosures.

In August 2018, the FASB issued ASU No. 2018-14, *Compensation—Retirement Benefits—Defined Benefit Plans—General (Subtopic 715-20): Disclosure Framework—Changes to the Disclosure Requirements for Defined Benefit Plans*, which eliminates, amends and adds disclosure requirements for defined benefit pension and other postretirement plans. The standard is required to be adopted for annual periods ending after December 15, 2020, which is our fiscal year 2021. The new guidance

is to be applied using a retrospective approach with early adoption permitted. We have not yet evaluated the impact the adoption of this guidance may have on our financial condition, results of operations or disclosures.

Adopted

In February 2016, the FASB issued ASU No. 2016-02, *Leases (Topic 842)*, followed by related amendments (collectively, "the new lease standard"), which requires lessees to recognize most leases on the balance sheet for the rights and obligations created by those leases. We adopted the new lease standard on September 29, 2019 under the modified retrospective transition method and the optional transition method. As a result, we did not adjust our comparative period financial information or make the new required lease disclosures for periods before the effective date. We elected the package of practical expedients to not reassess prior conclusions related to contracts containing leases, lease classification and initial direct costs. In addition, we did not elect to apply the hindsight practical expedient. See Note 5 for our new lease accounting policy and disclosures related to this guidance.

NOTE 3 REVENUE

Revenue Recognition

Revenue is recognized when control of the promised goods or services is transferred to our customers in an amount that reflects the consideration we expect to be entitled to in exchange for transferring those goods or providing those services. We account for a contract when it has approval and commitment from both parties, the rights of the parties are identified, payment terms are known, the contract has commercial substance and collectability of consideration is probable.

A performance obligation is a promise in a contract to transfer a distinct good or service to the customer and is the unit of account under the revenue recognition standard. A contract's transaction price is allocated to each distinct performance obligation and recognized as revenue when, or as, the performance obligation is satisfied. Many of our contracts have a single performance obligation as the promise to transfer the individual goods or services is not separately identifiable from other promises in the contracts and, therefore, not distinct. In situations when our contract includes distinct goods or services that are substantially the same and have the same pattern of transfer to the customer over time, they are recognized as a series of distinct goods or services. For contracts with multiple performance obligations, we allocate the contract's transaction price to each performance obligation using our best estimate of the standalone selling price of each distinct good or service in the contract.

We do not adjust the promised amount of consideration for the effects of a significant financing component if we expect, at contract inception, that the period between when we transfer a promised good or service to a customer and when the customer pays for that good or service will be one year or less.

Revenue is recorded net of taxes collected from customers, and taxes collected are recorded as current liabilities until remitted to the relevant government authority. Shipping and handling costs associated with outbound freight after control of a product has transferred are accounted for as a fulfillment cost and are included in cost of sales in the Consolidated Statements of Income.

The following is a description of the product offerings, end markets, typical revenue transactions and payment terms for each of our two reportable segments. See Note 14 for further information on reportable segments.

Test & Simulation

Our Test & Simulation segment (Test & Simulation) manufactures and sells equipment and related software and services which are used by customers to characterize a product's mechanical properties or performance. Our solutions simulate forces and motions that customers expect their products to encounter in use or are necessary to properly characterize the product's performance. Primary Test & Simulation markets include transportation, infrastructure, energy, aerospace, materials science, medical, flight training and amusement parks. A typical system is a comprehensive solution which includes a reaction frame to hold the prototype specimen; a hydraulic or electro-mechanical power source; actuators to create the force or motion; and a computer controller with specialized software to coordinate the actuator movement and to measure, record, analyze and manipulate results. Our portfolio of Test & Simulation solutions includes standard, configurable testing products; engineered products which combine standard product configurations with a moderate degree of customization per customer specifications; and highly customized, highly engineered testing solutions built to address the customer's unique business need, which can include development of first-of-a-kind technology. To complement our Test & Simulation products, we provide our customers with a spectrum of services to maximize product performance including installation, product life cycle management, professional training, calibration and metrology, technical consulting and onsite and factory repair and maintenance. In addition, we sell a variety of accessories and spare parts. The manufacturing cycle for a typical system ranges from weeks to 12 months, depending on the complexity of the system and the availability of components, and can be several years for larger, more complex systems. For certain contracts, the order to revenue cycle may extend beyond the manufacturing cycle, such as

when the manufacturing start date is driven by the customer's project timeline or when the contract terms require equipment installation and commissioning and customer acceptance prior to point-in-time revenue recognition.

Test & Simulation contracts often have multiple performance obligations, most commonly due to the contract covering multiple phases of the product life cycle (i.e., equipment design and production, installation and commissioning, extended warranty and software maintenance). The primary method used to estimate standalone selling price is the expected cost plus a margin approach under which we forecast our expected costs of satisfying a performance obligation and then add an appropriate margin for that distinct good or service.

Test & Simulation revenue is recognized either over time as work progresses or point-in-time, depending on contract-specific terms and the pattern of transfer of control of the product or service to the customer. Revenue from services is recognized in the period the service is performed or ratably over the period of the related service contract. Equipment revenue is recognized over time when: (i) control is transferred to the customer over time as work progresses; or (ii) contract terms evidence customer control of the work in process or an enforceable right to payment with no alternative use. Equipment revenue is recognized over time using costs incurred to date relative to total estimated costs at completion to measure progress toward satisfying the performance obligation. Incurred cost represents work performed, which corresponds with, and thereby best depicts, the transfer of control to the customer. Equipment contract costs include materials, component parts, labor and overhead costs.

Equipment revenue is recognized point-in-time when either: (i) control is transferred to the customer at a point-in-time when obligations under the terms of the contract are satisfied; or (ii) contract terms do not evidence customer control of the work in process or an enforceable right to payment with no alternative use, and consequently revenue is deferred as work progresses. Satisfaction of performance obligations under the terms of the contract occurs either upon product shipment (as evidenced by delivery or shipment terms), completion of equipment installation and commissioning, or customer acceptance.

For our Test & Simulation contracts with customers, payment terms vary and are subject to negotiation. Typical payment terms include progress payments based on specified events or milestones. For some contracts, we are entitled to receive an advance payment.

Sensors

Our Sensors segment (Sensors) manufactures and sells high-performance sensors which provide measurements of vibration, pressure, position, force and sound in a variety of applications. Our Sensors products are used to enable automation, enhance precision and safety, and lower our customers' production costs by improving performance and reducing downtime. Primary Sensors markets include automotive, aerospace and defense, industrial, and research and development. Our Sensors products are sold as configurable, standard units; utilize piezoelectric or magnetostriction technology; and are ideal for use in harsh operating environments to provide accurate and reliable sensor information. To complement our Sensors products, we also provide spare parts and services. The cycle from contract inception to shipment of equipment is typically one to three months, with the exception of certain high-volume contracts which are fulfilled in a series of shipments over an extended period.

Our Sensors contracts generally have a single performance obligation which is satisfied at a point in time. The performance obligation is a stand-alone sensor product, accessory, service or software license. Sensors contracts are generally fixed-price purchase order fulfillment contracts, and the transaction price is equal to the observable consideration in the contract. Revenue is recognized when obligations under the terms of the contract with our customer are satisfied; generally this occurs with the transfer of control upon product shipment (as evidenced by shipment or delivery terms) or with the performance of the service. Certain contracts are measured using the as invoiced practical expedient as we have a right to consideration from a customer in an amount that corresponds directly with the value to the customer of our performance completed to date.

For our Sensors contracts with customers, payment terms are generally within 90 days. The timing of satisfying our Sensors performance obligations does not vary significantly from the typical timing of payment. For certain high-volume contracts, we are entitled to receive an advance payment.

Disaggregation of Revenue

We disaggregate our revenue by reportable segment, sales type (product or service), the timing of recognition of revenue for transfer of goods or services to customers (point-in-time or over time), and geographic market based on the billing location of the customer. See Note 14 for further information on our reportable segments and intersegment revenue.

	Three Months Ended December 28, 2019			
	Test & Simulation	Sensors	Intersegment	Total
Sales type				
Product	\$ 95,496	\$ 83,774	\$ (412)	\$ 178,858
Service	25,234	1,761	(10)	26,985
Total revenue	\$ 120,730	\$ 85,535	\$ (422)	\$ 205,843
Timing of recognition				
Point-in-time	\$ 60,104	\$ 77,163	\$ (422)	\$ 136,845
Over time	60,626	8,372	—	68,998
Total revenue	\$ 120,730	\$ 85,535	\$ (422)	\$ 205,843
Geographic market				
Americas	\$ 37,848	\$ 46,545	\$ (422)	\$ 83,971
Europe	26,515	22,542	—	49,057
Asia	56,367	16,448	—	72,815
Total revenue	\$ 120,730	\$ 85,535	\$ (422)	\$ 205,843

	Three Months Ended December 29, 2018			
	Test & Simulation	Sensors	Intersegment	Total
Sales type				
Product	\$ 98,907	\$ 76,500	\$ (329)	\$ 175,078
Service	26,653	1,450	—	28,103
Total revenue	\$ 125,560	\$ 77,950	\$ (329)	\$ 203,181
Timing of recognition				
Point-in-time	\$ 79,619	\$ 77,950	\$ (329)	\$ 157,240
Over time	45,941	—	—	45,941
Total revenue	\$ 125,560	\$ 77,950	\$ (329)	\$ 203,181
Geographic market				
Americas	\$ 39,489	\$ 37,729	\$ (329)	\$ 76,889
Europe	28,627	25,348	—	53,975
Asia	57,444	14,873	—	72,317
Total revenue	\$ 125,560	\$ 77,950	\$ (329)	\$ 203,181

Contract Assets and Liabilities

Contract assets and contract liabilities are as follows:

	December 28, 2019	September 28, 2019
Contract assets	\$ 67,368	\$ 80,331
Contract liabilities	73,858	81,045

The timing of revenue recognition, billings and cash collections results in billed accounts receivable, unbilled accounts receivable (contract assets) and advance payments from customers (contract liabilities). Contract balances are classified as assets or liabilities on a contract-by-contract basis at the end of each reporting period. Contract liabilities represent payments received from customers at contract inception and at milestones per contract provisions. These payments are recorded in advance payments from customers and other long-term liabilities in our Consolidated Balance Sheets (current and non-current portions, respectively) and are liquidated as revenue is recognized. Conversely, when billing occurs subsequent to revenue recognition for contracts recognized over time, balances are recorded in unbilled accounts receivable, net in our Consolidated Balance Sheets. As customers are billed, unbilled accounts receivable balances are transferred to accounts receivable, net in the Consolidated Balance Sheets.

Significant changes in contract assets and contract liabilities are as follows:

	Contract Assets	
Balance, September 28, 2019	\$	80,331
Changes in estimated stage of completion		29,500
Transfers to accounts receivable, net		(41,635)
Other		(828)
Balance, December 28, 2019	\$	67,368

	Contract Liabilities	
Balance, September 28, 2019	\$	81,045
Revenue recognized included in balance at beginning of period		(33,485)
Increases due to payments received, excluding amounts recognized as revenue during period		27,111
Other		(813)
Balance, December 28, 2019	\$	73,858

Remaining Performance Obligations

As of December 28, 2019, we had approximately \$183,000 of remaining performance obligations on contracts with an original expected duration of one year or more which are primarily related to Test & Simulation. As of December 28, 2019, we expect to recognize approximately 75% of these remaining performance obligations as revenue within one year, an additional 23% within two years and the balance thereafter. We do not disclose the value of remaining performance obligations for contracts with an original expected duration of one year or less.

Contract Estimates

For contracts recognized over time, we estimate the profit on a contract as the difference between the total estimated revenue and expected costs to complete a contract and recognize that profit over the life of the contract. Contract estimates are based on various assumptions to project the outcome of future events that may span several years. These assumptions include labor productivity and availability, the complexity of the work to be performed, the cost and availability of materials, and internal and subcontractor performance.

Pricing is established at or prior to the time of sale with our customers, and we record sales at the agreed-upon selling price. The terms of a contract or the historical business practice can give rise to variable consideration due to but not limited to volume discounts, penalties and early payment discounts. We estimate variable consideration at the most likely amount we will receive from customers. We include estimated amounts in the transaction price to the extent it is probable that a significant reversal of cumulative revenue recognized for such transaction will not occur, or when the uncertainty associated with the variable consideration is resolved. In general, variable consideration in our contracts relates to the entire contract. As a result, the variable consideration is allocated proportionately to all performance obligations. Our estimates of variable consideration and determination of whether to include estimated amounts in the transaction price are based largely on an assessment of our anticipated performance and all information (historical, current and forecasted) that is reasonably available to us at contract inception. There are no significant instances where variable consideration is constrained and not recorded at the initial time of sale.

As a significant change in one or more of these estimates could affect the profitability of our contracts, we review and update our contract-related estimates regularly. We recognize adjustments in estimated profit on contracts under the cumulative catch-up method. Under this method, the impact of the adjustment on profit recorded to date is recognized in the period the adjustment is identified. Revenue and profit in future periods of contract performance is recognized using the adjusted estimate. If at any time the estimate of contract profitability indicates an anticipated loss on the contract, we recognize the total loss in

the period it is identified. Our review of contract-related estimates has not resulted in adjustments that are significant to our results of operations.

Contract Modifications

When contracts are modified to account for changes in contract specifications and requirements, we consider whether the modification either creates new, or changes existing, enforceable rights and obligations. Contract modifications that are for goods or services that are not distinct from the existing contract, due to the significant integration with the original product or service provided, are accounted for as if they were part of that existing contract. The effect of a contract modification on the transaction price, and our measure of progress for the performance obligation to which it relates, is recognized as an adjustment to revenue (either as an increase in or a reduction of revenue) under the cumulative catch-up method. When the modifications include additional performance obligations that are distinct and at a relative stand-alone selling price, they are accounted for as a new contract and performance obligation and recognized prospectively.

Warranties and Returns

For both Test & Simulation and Sensors, we provide a manufacturer's warranty on our products and systems which is included in customer contracts. For sales that include installation services, warranty obligations generally extend for a period of 12 to 24 months from the date of either shipment or acceptance based on contract terms. Product obligations generally extend 12 to 24 months from the date of purchase. Certain products offered in our Sensors segment include a lifetime warranty.

Under the terms of these warranties, we are obligated to repair or replace any components or assemblies deemed defective due to workmanship or materials. We reserve the right to reject warranty claims where it is determined that failure is due to normal wear, customer modifications, improper maintenance or misuse. At the time a sale is recognized, we record estimated future warranty costs. The percentage applied reflects our historical warranty claims experience over the preceding 12-month period. Both the experience percentage and the warranty liability are evaluated on an ongoing basis for adequacy. Warranty provisions are also recognized for certain unanticipated product claims that are individually significant. We also offer separately-priced extended warranties or service-type contracts on certain products for which revenue is recognized over the contractual period or as services are rendered.

Our sales terms generally do not allow for a right of return except for situations where the product fails. When the right of return exists, we recognize revenue for the transferred products at the expected amount of consideration for which we will be entitled.

Shipping and Handling

Freight revenue billed to customers is reported within revenue in the Consolidated Statements of Income. Expenses incurred for shipping products to customers are reported within cost of sales in the Consolidated Statements of Income.

Pre-contract Costs

We recognize an asset for the incremental costs of obtaining a contract with a customer (i.e., pre-contract costs) when costs are considered recoverable. Capitalized pre-contract costs, consisting primarily of Test & Simulation sales commissions, are amortized as the related revenue is recognized. We recognized total capitalized pre-contract costs of \$4,378 and \$4,297 in prepaid expenses and other current assets and other long-term assets in the Consolidated Balance Sheets as of December 28, 2019 and September 28, 2019, respectively, and related expense of \$1,463 and \$2,620 in the Consolidated Statements of Income during the three months ended December 28, 2019 and December 29, 2018, respectively.

NOTE 4 INVENTORIES

Inventories consist of material, labor and overhead costs and are stated at the lower of cost or net realizable value determined under the first-in, first-out accounting method. Certain inventories are measured using the weighted average cost method. Inventories, net are as follows:

	December 28, 2019	September 28, 2019
Components, assemblies and parts	\$ 116,257	\$ 112,886
Customer projects in various stages of completion	45,096	39,534
Finished goods	15,664	14,779
Total inventories, net	\$ 177,017	\$ 167,199

NOTE 5 LEASES

We determine if an arrangement contains a lease at inception based on whether or not we have the right to control the asset during the contract period and other facts and circumstances. We are the lessee in a lease contract when we obtain the right to control the asset. Operating leases are included in other long-term assets, other accrued liabilities and other long-term liabilities in our Consolidated Balance Sheet. Right-of-use assets represent our right to use an underlying asset for the lease term, and lease liabilities represent our obligation to make lease payments arising from the lease, both of which are recognized based on the present value of the future minimum lease payments over the lease term at the commencement date. Leases with a lease term of 12 months or less at inception are not recorded on our Consolidated Balance Sheet and are expensed on a straight-line basis over the lease term in our Consolidated Statement of Income. We determine the lease term by assuming the exercise of renewal options that are reasonably certain. Most leases have remaining lease terms of one to ten years, some of which include options to extend the lease terms one to five years or more.

As most of our leases do not provide an implicit interest rate, we use our incremental borrowing rate based on the information available at the commencement date in determining the present value of future payments. The incremental borrowing rate is used in determining the present value of lease payments, unless an implicit rate is specified. When our contracts contain lease and non-lease components, we account for both components as a single lease component.

We have operating leases for facilities, vehicles and equipment. We also have financing leases for certain vehicles. Our lease agreements do not contain any material residual value guarantees, material bargain purchase options or material restrictive covenants. We have no material sublease arrangements with third parties or lease transactions with related parties.

During the three months ended December 28, 2019, rent expense was \$2,818, primarily related to operating lease costs. Costs associated with short-term leases, variable rent and subleases were immaterial.

Supplemental balance sheet information related to leases is as follows:

	Classification	December 28, 2019		September 29, 2019	
Assets					
Operating leases	Other long-term assets	\$	19,861	\$	20,356
Finance leases	Other long-term assets ¹		1,304		1,436
Total leased assets		\$	21,165	\$	21,792
Liabilities					
Current					
Operating leases	Other accrued liabilities	\$	7,233	\$	7,447
Finance leases	Other accrued liabilities ²		576		570
Non-current					
Operating leases	Other long-term liabilities		12,628		12,909
Finance leases	Other long-term liabilities ²		728		866
Total lease liabilities		\$	21,165	\$	21,792

¹ Assets held under capital leases were reclassified from property and equipment, net to other long-term assets as part of the adoption of the new lease standard.

² Finance lease obligations were reclassified from long-term debt, less current maturities, net to other accrued liabilities and other long-term liabilities as part of the adoption of the new lease standard.

Supplemental cash flow information related to leases is as follows:

	Three Months Ended December 28, 2019	
Cash paid for amounts included in the measurement of lease liabilities		
Operating cash flows from operating leases	\$	2,536
Operating cash flows from finance leases		17
Financing cash flows from finance leases		147
Operating leased assets obtained in exchange for new lease liabilities	\$	1,116

The weighted average remaining lease terms and weighted average discount rates are as follows:

	December 28, 2019
Weighted average remaining lease term	
Operating leases	4.4 years
Finance leases	2.2 years
Weighted average discount rate	
Operating leases	3.3%
Finance leases	5.0%

Future lease payments under non-cancelable leases for the next five years and thereafter are as follows:

	December 28, 2019	
	Operating Leases	Finance Leases
Remainder of 2020	\$ 6,352	\$ 458
2021	6,276	611
2022	3,662	290
2023	2,247	—
2024	1,489	—
2025	563	—
Thereafter	1,583	—
Total lease payments	22,172	1,359
Less imputed interest	(2,311)	(55)
Total reported lease liability	\$ 19,861	\$ 1,304

As of December 28, 2019, we have no material additional operating or finance leases that have not yet commenced.

Future minimum lease commitments under non-cancelable leases for the next five years and thereafter were as follows:

	September 28, 2019	
	Operating Leases	Capital Leases
2020	\$ 7,149	\$ 570
2021	5,291	588
2022	3,124	278
2023	1,602	—
2024	1,085	—
Thereafter	1,789	—
Total	\$ 20,040	\$ 1,436

NOTE 6 CAPITAL ASSETS**Property and Equipment**

Property and equipment, net are as follows:

	December 28, 2019	September 28, 2019
Land and improvements	\$ 3,955	\$ 3,949
Buildings and improvements	68,349	64,140
Machinery and equipment	227,723	224,684
Assets held under capital leases ¹	—	2,796
Total property and equipment	300,027	295,569
Less: Accumulated depreciation	(198,035)	(194,486)
Total property and equipment, net	\$ 101,992	\$ 101,083

¹ Assets held under capital leases were reclassified from property and equipment, net to other long-term assets as part of the adoption of the new lease standard. See Note 5 for additional information regarding leases.

Goodwill

Changes to the carrying amount of goodwill are as follows:

	Test & Simulation	Sensors	Total
Balance, September 28, 2019	\$ 61,153	\$ 367,886	\$ 429,039
Acquisitions ²	—	(46)	(46)
Currency translation	833	12	845
Balance, December 28, 2019	\$ 61,986	\$ 367,852	\$ 429,838

² See Note 15 for additional information regarding acquisitions.

Intangible Assets

Intangible assets are as follows:

	December 28, 2019			Weighted Average Useful Life (in Years)
	Gross Carrying Amount	Accumulated Amortization	Net Carrying Value	
Software development costs ³	\$ 42,787	\$ (16,101)	\$ 26,686	6.0
Technology and patents	63,327	(16,864)	46,463	14.9
Trademarks and trade names	20,343	(4,111)	16,232	18.4
Customer lists	193,227	(37,908)	155,319	15.6
Land-use rights	2,317	(1,033)	1,284	25.8
Other	3,665	(1,015)	2,650	4.0
Trade names	57,500	—	57,500	Indefinite
Total intangible assets	\$ 383,166	\$ (77,032)	\$ 306,134	14.3

September 28, 2019

	Gross Carrying Amount	Accumulated Amortization	Net Carrying Value	Weighted Average Useful Life (in Years)
Software development costs ³	\$ 39,546	\$ (16,035)	\$ 23,511	6.2
Technology and patents	63,015	(15,739)	47,276	14.9
Trademarks and trade names	20,186	(3,808)	16,378	18.4
Customer lists	192,488	(34,735)	157,753	15.6
Land-use rights	2,303	(968)	1,335	25.7
Other	3,606	(774)	2,832	4.0
Trade names	57,500	—	57,500	Indefinite
Total intangible assets	\$ 378,644	\$ (72,059)	\$ 306,585	14.4

³ The gross carrying amount of software development costs as of December 28, 2019 and September 28, 2019 includes \$25,082 and \$21,840, respectively, of software not yet available for general release to the public.

Amortization expense recognized related to finite-lived intangible assets is as follows:

	Three Months Ended	
	December 28, 2019	December 29, 2018
Amortization expense	\$ 4,785	\$ 3,816

Estimated future amortization expense related to finite-lived intangible assets is as follows:

	Amortization Expense
Remainder of 2020	\$ 14,290
2021	20,285
2022	21,334
2023	20,446
2024	20,078
2025	19,921
Thereafter	132,280

Future amortization amounts presented above are estimates. Actual future amortization expense may be different due to fluctuations in foreign currency exchange rates, future acquisitions, impairments, changes in amortization periods or other factors.

NOTE 7 FAIR VALUE MEASUREMENTS

In determining the fair value of financial assets and liabilities, we currently utilize market data or other assumptions that we believe market participants would use in pricing the asset or liability in the principal or most advantageous market and adjust for non-performance and/or other risk associated with the company as well as counterparties, as appropriate. When considering market participant assumptions in fair value measurements, the following fair value hierarchy distinguishes between observable and unobservable inputs, which are categorized in one of the following levels:

- **Level 1:** Unadjusted quoted prices which are available in active markets for identical assets or liabilities accessible to us at the measurement date.
- **Level 2:** Inputs other than quoted prices included in Level 1 inputs that are observable for the asset or liability, either directly or indirectly, for substantially the full term of the asset or liability.
- **Level 3:** Unobservable inputs for the asset or liability used to measure fair value to the extent that observable inputs are not available, thereby allowing for situations in which there is little, if any, market activity for the asset or liability at the measurement date.

The hierarchy gives the highest priority to Level 1, as this level provides the most reliable measure of fair value, while giving the lowest priority to Level 3.

Assets and Liabilities Measured at Fair Value on a Recurring Basis

Financial assets and liabilities subject to fair value measurements on a recurring basis are as follows:

	December 28, 2019			
	Level 1	Level 2	Level 3	Total
Assets				
Currency contracts ¹	\$ —	\$ 665	\$ —	\$ 665
Total assets	—	665	—	665
Liabilities				
Currency contracts ¹	—	194	—	194
Total liabilities	\$ —	\$ 194	\$ —	\$ 194
	September 28, 2019			
	Level 1	Level 2	Level 3	Total
Assets				
Currency contracts ¹	\$ —	\$ 907	\$ —	\$ 907
Total assets	—	907	—	907
Liabilities				
Currency contracts ¹	—	251	—	251
Total liabilities	\$ —	\$ 251	\$ —	\$ 251

¹ Based on observable market transactions of spot currency rates and forward currency rates on equivalently-termed instruments. Carrying amounts of the financial assets and liabilities are equal to the fair value. See Note 8 for additional information on derivative financial instruments.

Assets and Liabilities Measured at Fair Value on a Nonrecurring Basis

We measure certain financial instruments at fair value on a nonrecurring basis. These assets primarily include goodwill, intangible assets and other long-lived assets acquired either as part of a business acquisition, individually or with a group of other assets, as well as property and equipment and right-of-use lease assets. These assets were initially measured and recognized at amounts equal to the fair value determined as of the date of acquisition or purchase subject to changes in value only for foreign currency translation. Periodically, these assets are tested for impairment by comparing their respective carrying values to the estimated fair value of the reporting unit or asset group in which they reside. In the event any of these assets were to become impaired, we would recognize an impairment loss equal to the amount by which the carrying value of the reporting unit, impaired asset or asset group exceeds its estimated fair value. Fair value measurements of reporting units are estimated using an income approach involving discounted or undiscounted cash flow models that contain certain Level 3 inputs requiring management judgment, including projections of economic conditions and customer demand, revenue and margins, changes in competition, operating costs, working capital requirements and new product introductions. Fair value measurements of the reporting units associated with our goodwill balances and our indefinite-lived intangible assets are estimated at least annually in the fourth quarter of each fiscal year for purposes of impairment testing if a quantitative analysis is performed. Fair value measurements associated with our intangible assets, other long-lived assets, property and equipment and right-of-use lease assets are estimated when events or changes in circumstances such as market value, asset utilization, physical change, legal factors or other matters indicate that the carrying value may not be recoverable. See Note 6 for additional information on goodwill, indefinite-lived intangible assets, other long-lived assets and property and equipment. See Note 5 for additional information on right-of-use lease assets.

Assets and Liabilities Not Measured at Fair Value

Certain financial instruments are not measured at fair value but are recorded at carrying amounts approximating fair value based on their short-term nature or variable interest rate. These financial instruments include cash and cash equivalents, accounts receivable, unbilled accounts receivable, accounts payable and short-term borrowings.

Other Financial Instruments

Other financial instruments subject to fair value measurements include debt, which is recorded at carrying value in the Consolidated Balance Sheets. The carrying amount and estimated fair values of our debt are as follows:

	December 28, 2019				
	Carrying Value	Fair Value	Level 1	Level 2	Level 3
Tranche B term loan ²	\$ 172,545	\$ 173,839	\$ —	\$ 173,839	\$ —
Senior unsecured notes ²	350,000	366,625	—	366,625	—
Total debt	\$ 522,545	\$ 540,464	\$ —	\$ 540,464	\$ —

	September 28, 2019				
	Carrying Value	Fair Value	Level 1	Level 2	Level 3
Tranche B term loan ²	\$ 173,695	\$ 174,563	\$ —	\$ 174,563	\$ —
Senior unsecured notes ²	350,000	366,625	—	366,625	—
Total debt	\$ 523,695	\$ 541,188	\$ —	\$ 541,188	\$ —

² The fair value of the tranche B term loan and senior unsecured notes is based on the most recently quoted market price for the outstanding debt instrument, adjusted for any known significant deviations in value. The estimated fair value of the debt obligation is not necessarily indicative of the amount that would be realized in a current market exchange. See Note 9 for additional information on financing arrangements.

NOTE 8 DERIVATIVE INSTRUMENTS AND HEDGING ACTIVITIES

Our currency exchange contracts are designated as cash flow hedges and qualify as hedging instruments. We also have derivatives that are not designated as cash flow hedges and, therefore, are accounted for and reported under foreign currency guidance. Regardless of designation for accounting purposes, we believe all of our derivative instruments are hedges of transactional risk exposures. The fair value of our outstanding designated and undesignated derivative assets and liabilities are reported in the Consolidated Balance Sheets as follows:

	December 28, 2019	
	Prepaid Expenses and Other Current Assets	Other Accrued Liabilities
Designated hedge derivatives		
Cash flow derivatives	\$ 665	\$ 126
Total designated hedge derivatives	665	126
Undesignated hedge derivatives		
Balance sheet derivatives	—	68
Total hedge derivatives	\$ 665	\$ 194

	September 28, 2019	
	Prepaid Expenses and Other Current Assets	Other Accrued Liabilities
Designated hedge derivatives		
Cash flow derivatives	\$ 907	\$ 133
Total designated hedge derivatives	907	133
Undesignated hedge derivatives		
Balance sheet derivatives	—	118
Total hedge derivatives	\$ 907	\$ 251

A reconciliation of the net fair value of designated hedge derivatives subject to master netting arrangements that are recorded in the Consolidated Balance Sheets to the net fair value that could have been reported in the Consolidated Balance Sheets are as follows:

	Gross Recognized Amount	Gross Offset Amount	Net Amount Presented	Derivatives Subject to Offset	Cash Collateral Received	Net Amount
December 28, 2019						
Assets	\$ 665	\$ —	\$ 665	\$ (126)	\$ —	\$ 539
Liabilities	126	—	126	(126)	—	—
September 28, 2019						
Assets	\$ 907	\$ —	\$ 907	\$ (133)	\$ —	\$ 774
Liabilities	133	—	133	(133)	—	—

Cash Flow Hedging – Currency Risks

Currency exchange contracts utilized to maintain the functional currency value of expected financial transactions denominated in foreign currencies are designated as cash flow hedges. Gains and losses related to changes in the market value of these contracts are reported as a component of accumulated other comprehensive income (AOCI) within shareholders' equity in the Consolidated Balance Sheets and reclassified to earnings in the same line item in the Consolidated Statements of Income and in the same period as the recognition of the underlying hedged transaction. We periodically assess whether our currency exchange contracts are effective and, when a contract is determined to be no longer effective as a hedge, we discontinue hedge accounting prospectively.

As of December 28, 2019 and September 28, 2019, we had outstanding cash flow hedge currency exchange contracts with gross notional U.S. dollar equivalent amounts of \$40,162 and \$43,033, respectively. Upon netting offsetting contracts to sell foreign currencies against contracts to purchase foreign currencies, irrespective of contract maturity dates, the net notional U.S. dollar equivalent amount of contracts outstanding was \$27,347 and \$38,177 as of December 28, 2019 and September 28, 2019, respectively. As of December 28, 2019, the net market value of the foreign currency exchange contracts was a net asset of \$539, consisting of \$665 in assets and \$126 in liabilities. As of September 28, 2019, the net market value of the foreign currency exchange contracts was a net asset of \$774, consisting of \$907 in assets and \$133 in liabilities.

The pretax amounts recognized in AOCI on currency exchange contracts, including (gains) losses reclassified into earnings in the Consolidated Statements of Income and gains (losses) recognized in other comprehensive income (loss) (OCI), are as follows:

	Three Months Ended	
	December 28, 2019	December 29, 2018
Beginning unrealized net gain (loss) in AOCI	\$ 566	\$ 672
Net (gain) loss reclassified into revenue	(19)	(585)
Net gain (loss) recognized in OCI	(150)	127
Ending unrealized net gain (loss) in AOCI	\$ 397	\$ 214

As of December 28, 2019, the amount projected to be reclassified from AOCI into earnings in the next 12 months was a net gain of \$364. The maximum remaining maturity of any forward or optional contract as of December 28, 2019 was 0.9 years.

Interest Rate Swap

On October 20, 2016, we entered into a floating to fixed interest rate swap agreement to mitigate our exposure to interest rate increases related to a portion of our tranche B term loan facility. In connection with the repayment of a portion of the tranche B term loan facility during the fourth quarter of fiscal year 2019, we terminated the interest rate swap agreement. Prior to termination, every month we paid fixed interest at 1.256% in exchange for interest received at one month U.S. LIBOR. The interest rate swap was designated as a cash flow hedge. As a result, changes in the fair value of the interest rate swap were recorded in AOCI within shareholders' equity in the Consolidated Balance Sheets. The unrealized gains on the interest rate swap associated with the interest payments on our tranche B term loan facility that are still forecasted to occur are included in AOCI. These gains will be reclassified into interest expense over the life of the original swap agreement as the hedged interest payments occur.

The pretax amounts recognized in AOCI on the interest rate swap, including (gains) losses reclassified into earnings in the Consolidated Statements of Income and gains (losses) recognized in OCI, are as follows:

	Three Months Ended	
	December 28, 2019	December 29, 2018
Beginning unrealized net gain (loss) in AOCI	\$ 1,079	\$ 7,411
Net (gain) loss reclassified into interest expense	(301)	(584)
Net gain (loss) recognized in OCI	—	(1,938)
Ending unrealized net gain (loss) in AOCI	\$ 778	\$ 4,889

As of December 28, 2019, the amount projected to be reclassified from AOCI into earnings in the next 12 months was a net gain of \$684.

Foreign Currency Balance Sheet Derivatives

We also use foreign currency derivative contracts to maintain the functional currency value of monetary assets and liabilities denominated in non-functional foreign currencies. The gains and losses related to the changes in the market value of these derivative contracts are included in other income (expense), net in the Consolidated Statements of Income.

As of December 28, 2019 and September 28, 2019, we had outstanding foreign currency balance sheet derivative contracts with gross notional U.S. dollar equivalent amounts of \$78,768 and \$60,827, respectively. Upon netting offsetting contracts by counterparty banks to sell foreign currencies against contracts to purchase foreign currencies, irrespective of contract maturity dates, the net notional U.S. dollar equivalent amount of contracts outstanding as of December 28, 2019 and September 28, 2019 was \$18,060 and \$118, respectively. As of December 28, 2019 and September 28, 2019, the net market value of the foreign exchange balance sheet derivative contracts was a net liability of \$68 and \$118, respectively.

The net gain (loss) recognized in the Consolidated Statements of Income on foreign exchange balance sheet derivative contracts is as follows:

	Three Months Ended	
	December 28, 2019	December 29, 2018
Net gain (loss) recognized in other income (expense), net	\$ (546)	\$ 7

NOTE 9 FINANCING

Long-term debt consists of the following:

	December 28, 2019	September 28, 2019
Long-term debt		
Tranche B term loan, 1.00% amortizing per year, maturing July 5, 2023	\$ 172,545	\$ 173,695
Senior unsecured notes, 5.75% coupon, maturing August 15, 2027	350,000	350,000
Capital lease obligations ¹	—	1,436
Total long-term debt	522,545	525,131
Less: Unamortized underwriting discounts, commissions and other expenses	(9,729)	(10,313)
Less: Current maturities of tranche B term loan debt ^{2, 3}	(29,600)	(29,600)
Less: Current maturities of capital lease obligations ^{1, 2}	—	(570)
Total long-term debt, less current maturities, net	\$ 483,216	\$ 484,648

¹ Capital lease obligations were reclassified from long-term debt, less current maturities, net and current maturities of long-term debt, net to other accrued liabilities and other long-term liabilities as part of the adoption of the new lease standard in the first quarter of fiscal year 2020. See Note 5 for additional information on leases.

² In addition to the current maturities above, current maturities of long-term debt, net in the Consolidated Balance Sheets includes the current portion of unamortized underwriting discounts, commissions and other expenses of \$2,106 and \$2,201 as of December 28, 2019 and September 28, 2019, respectively.

³ As of December 28, 2019 and September 28, 2019, current maturities of tranche B term loan consist of the 1% annual payment and the calculated or estimated required annual Excess Cash Flow payment as defined below, as well as planned prepayments.

Tranche B Term Loan and Revolving Credit Facility

We have a credit agreement with U.S. Bank National Association and HSBC Bank USA, National Association as Co-Documentation Agents, Wells Fargo Bank, National Association as Syndication Agent, JPMorgan Chase Bank, N.A. as Administrative Agent and JP Morgan Chase Bank, N.A. and Wells Fargo Securities, LLC as Joint Bookrunners and Joint Lead Arrangers (the Credit Agreement). The Credit Agreement as amended provides for senior secured credit facilities consisting of a \$200,000 revolving credit facility (the Revolving Credit Facility) and a \$460,000 tranche B term loan facility (the Term Facility) which expire on July 5, 2023. The proceeds of the Revolving Credit Facility can be drawn upon to refinance existing indebtedness, for working capital and for other general corporate purposes, up to a maximum of \$200,000. The Term Facility amortizes in equal quarterly installments equal to 1% of the original principal amount.

In the first quarter of fiscal year 2020, we entered into a fourth amendment to the Credit Agreement to increase the borrowing capacity on the Revolving Credit Facility from \$150,000 to \$200,000 and extend the expiration date of the Revolving Credit Facility from July 5, 2022 to July 5, 2023. The amendment also reduced letter of credit commitments from \$60,000 to \$50,000. Additionally, the required performance levels under certain financial covenants were modified. During the three months ended December 28, 2019, we incurred debt financing costs of \$577 as a result of this amendment which were capitalized in prepaid and other current assets and other long-term assets in the Consolidated Balance Sheets.

The primary categories of borrowing include Alternate Base Rate (ABR) Borrowings (ABR Term Loans and ABR Revolving Loans), Swingline Loans and Eurocurrency Borrowings (Eurocurrency Term Loans and Eurocurrency Revolving Loans), each as defined in the Credit Agreement. ABR Borrowings and Swingline Loans made in U.S. dollars under the Credit Agreement bear interest at a rate per annum equal to the ABR plus the Applicable Rate (as defined in the Credit Agreement). The ABR is defined as the greater of (a) the Prime Rate (as defined in the Credit Agreement) in effect on such day, (b) the New York Federal Reserve Bank (NYFRB) rate (as defined in the Credit Agreement) in effect on such day plus ½ of 1.00%, or (c) the Adjusted LIBOR (as defined in the Credit Agreement) for a one-month interest period in dollars on such day plus 1.00%. The ABR for ABR Term Loans shall not be less than 1.75% per annum. The Applicable Rate for any ABR Revolving Loans will be based upon the leverage ratio applicable on such date. As of December 28, 2019, the Applicable Rate for ABR Term Loans was 2.25% per annum.

Eurocurrency Borrowings made under the Credit Agreement bear interest at a rate per annum equal to the Adjusted LIBOR Rate plus the Applicable Rate. The Adjusted LIBOR Rate is defined as an interest rate per annum equal to (a) the LIBOR Rate for such interest period multiplied by (b) the Statutory Reserve Rate (as defined in the Credit Agreement). The Applicable Rate for any Eurocurrency Revolving Loan is based upon the leverage ratio applicable on such date. The Adjusted LIBOR Rate for Eurocurrency Term Loans shall not be less than 0.75% per annum. Based on our leverage ratio as of December 28, 2019, the Applicable Rate for Eurocurrency Revolving Loans was 2.75%. As of December 28, 2019, the Applicable Rate for Eurocurrency Term Loans was 3.25% per annum, plus the applicable Adjusted LIBOR Rate of 1.80%. The weighted average interest rate on Term Facility debt during the three months ended December 28, 2019 was 5.11%.

As of December 28, 2019, there was \$30,000 of outstanding borrowings under the Revolving Credit Facility which is included in short-term borrowings in the Consolidated Balance Sheets. As of September 28, 2019, there were no outstanding borrowings under the Revolving Credit Facility. We had outstanding letters of credit drawn from the Revolving Credit Facility totaling \$18,444 and \$21,173 as of December 28, 2019 and September 28, 2019, respectively, leaving approximately \$151,556 and \$128,827, respectively, of unused borrowing capacity. Commitment fees are payable on the unused portion of the Revolving Credit Facility at rates between 0.20% and 0.35% based on our leverage ratio. During the three months ended December 28, 2019 and December 29, 2018, commitment fees incurred totaled \$100 and \$72, respectively.

The Credit Agreement governing the Term Facility requires us to prepay outstanding term loans, subject to certain exceptions, depending on the leverage ratio with (a) up to 50% of our annual Excess Cash Flow (as defined in the Credit Agreement) and (b) 100% of the net cash proceeds of (i) certain asset sales and casualty and condemnation events, subject to reinvestment rights and certain other exceptions; and (ii) any incurrence or issuance of certain debt, other than debt permitted under the Credit Agreement. We may voluntarily prepay outstanding loans under the Term Facility at any time without premium or penalty. All obligations under the Credit Agreement are unconditionally guaranteed by certain of our existing wholly-owned domestic subsidiaries, and are secured, subject to certain exceptions, by substantially all of our assets and the assets of our subsidiary guarantors.

Under the Credit Agreement, we are subject to customary affirmative and negative covenants, including, among others, restrictions on our ability to incur debt, create liens, dispose of assets, make investments, loans, advances, guarantees, and

acquisitions, enter into transactions with affiliates, and enter into any restrictive agreements and customary events of default (including payment defaults, covenant defaults, change of control defaults and bankruptcy defaults). The Credit Agreement also contains financial covenants, including the ratio of consolidated total indebtedness to adjusted consolidated earnings before income, taxes, depreciation and amortization (Adjusted EBITDA), as defined in the Credit Agreement, as well as the ratio of Adjusted EBITDA to consolidated interest expense. These covenants restrict our ability to purchase outstanding shares of our common stock. As of December 28, 2019 and September 28, 2019, we were in compliance with these financial covenants.

Senior Unsecured Notes

In the fourth quarter of fiscal year 2019, we issued \$350,000 in aggregate principal amount of 5.750% senior unsecured notes due in 2027 (the Notes). The Notes were issued pursuant to an Indenture dated as of July 16, 2019 among us, the Guarantors (as defined therein) and Wells Fargo Bank, National Association, as trustee (the Indenture). The Notes will mature on August 15, 2027. Interest accrues at the rate of 5.750% per annum and is payable semi-annually on each February 15 and August 15, with the first interest payment due on February 15, 2020. We used the net proceeds after discounts and expenses of \$343,352 from the offering to repay all then outstanding debt under the Revolving Credit Facility, to repay a portion of the Term Facility and for general corporate purposes.

The Notes and the guarantees constitute senior unsecured obligations of the company and the Guarantors, respectively. The Notes are: (a) equal in right of payment with all existing or future unsecured indebtedness that is not subordinated to the Notes; (b) senior in right of payment to any existing or future indebtedness that is subordinated to the Notes; (c) unconditionally guaranteed by the Guarantors; (d) effectively subordinated to all existing or future indebtedness this is secured, including borrowings under the Credit Agreement, to the extent of the value of assets securing such indebtedness; and (e) structurally subordinated to all indebtedness, other liabilities and preferred stock, of any of our subsidiaries that are not Guarantors.

The Indenture governing the Notes contains covenants that limit, among other things, our ability and the ability of our restricted subsidiaries to incur additional indebtedness or issue certain preferred shares, create liens; pay dividends, redeem stock or make other distributions; make investments; for our restricted subsidiaries to pay dividends to us or make other intercompany transfers; transfer or sell assets; merge or consolidate; enter into certain transactions with our affiliates; and designate subsidiaries as unrestricted subsidiaries. If we experience a change of control, we must offer to repurchase all of the Notes (unless otherwise redeemed) at a price equal to 101% of the aggregate principal amount of the Notes, plus accrued and unpaid interest, if any, on such Notes to the repurchase date. If we sell assets under certain circumstances, we must use the proceeds to make an offer to repurchase all of the Notes at a price equal to 100% of their principal amount, plus accrued and unpaid interest, if any, to the date of purchase.

See Note 7 for additional information on the fair value of the tranche B term loan and the senior unsecured notes.

NOTE 10 STOCK-BASED COMPENSATION

We compensate our officers, directors and employees with stock-based compensation under the 2017 Stock Incentive Plan (the 2017 Plan) approved by our shareholders and administered under the supervision of our Board of Directors. As of December 28, 2019, a total of 607 shares were available for issuance under the 2017 Plan.

We make an annual stock grant under the 2017 Plan of stock options, restricted stock units and performance restricted stock units, as well as stock grants throughout the fiscal year. For fiscal years 2020, 2019 and 2018, the annual stock grant occurred in December 2019, December 2018 and April 2018, respectively.

Stock Options

During the three months ended December 28, 2019, 263 stock options were granted at a weighted average fair value of \$9.32. During the three months ended December 29, 2018, 230 stock options were granted at a weighted average fair value of \$9.89.

Restricted Stock Units and Performance Restricted Stock Units

We award restricted stock units to directors and key employees and performance restricted stock units to key employees. During the three months ended December 28, 2019, we granted 103 restricted stock units and 49 performance restricted stock units to directors, officers and employees. During the three months ended December 29, 2018, we granted 106 restricted stock units and 40 performance restricted stock units. The fair value of the restricted stock units and performance restricted stock units granted during the three months ended December 28, 2019 and December 29, 2018 was \$44.37 and \$45.80, respectively, representing the market value of our shares as of the date of grant less the present value of estimated foregone dividends over the vesting period.

Employee Stock Purchase Plan

Our U.S. employees are eligible to participate in the 2012 Employee Stock Purchase Plan (2012 ESPP) approved by our shareholders. During the three months ended December 28, 2019 and December 29, 2018, no shares were issued under the 2012 ESPP. As of December 28, 2019, 581 shares were available for issuance under the 2012 ESPP.

NOTE 11 INCOME TAXES

The Tax Cuts and Jobs Act (the Tax Act) was enacted into law on December 22, 2017 and made significant changes to U.S. federal corporate tax law. Effective January 1, 2018, the Tax Act lowered the U.S. corporate tax rate from 35% to 21% and prompted various other changes to U.S. federal corporate tax law, including the establishment of a territorial-style system for taxing foreign-source income of domestic multinational corporations and a one-time deemed repatriation tax on untaxed foreign earnings.

Generally, the impacts of new tax legislation would be required to be recorded in the period of enactment, which was our first quarter of fiscal year 2018. However, in March 2018, the FASB issued ASU No. 2018-05, *Income Taxes (Topic 740): Amendments to SEC Paragraphs Pursuant to SEC Staff Accounting Bulletin No. 118*, which incorporates various SEC paragraphs from Staff Accounting Bulletin No. 118 into income tax accounting guidance effective immediately, allowing registrants to record provisional amounts during a one-year measurement period.

The effective tax rate for the three months ended December 28, 2019 increased primarily due to certain discrete benefits in the prior year for the estimated impact of the Tax Act. Excluding the impact of certain discrete benefits in the prior year, the effective tax rate for the three months ended December 28, 2019 remained flat as compared to the same prior year period.

As of December 29, 2018, we completed our accounting for the tax effects of the Tax Act at the conclusion of the one-year measurement period. As a result, the income tax provision for the three months ended December 29, 2018 includes certain discrete benefits of \$1,293 for Tax Act measurement period adjustments. The discrete benefits relate to \$1,297 of additional dividends received deduction for certain foreign tax credits included in the mandatory deemed repatriation tax calculation, partially offset by \$4 of expense for other Tax Act measurement period adjustments. The additional dividends received deduction is based on our assessment of the treatment under the applicable provisions of the Tax Act as written and enacted during the first quarter of fiscal year 2019. The Department of the Treasury provided regulatory updates during the three months ended June 29, 2019, causing us to change our assessment of the benefit associated with the dividends received deduction, and in the third quarter of fiscal year 2019 to reverse the entire benefit of \$1,297 that was recorded in the first quarter of fiscal year 2019.

As of December 28, 2019, the liability for unrecognized tax benefits was \$5,034, of which \$3,381 would favorably affect our effective tax rate, if recognized. As of September 28, 2019, the liability for unrecognized tax benefits was \$4,414, of which \$2,761 would favorably affect our effective tax rate, if recognized. As of December 28, 2019, we do not expect significant changes in the amount of unrecognized tax benefits during the next twelve months.

NOTE 12 EARNINGS PER SHARE

Basic earnings per share is computed by dividing net income by the daily weighted average number of common shares outstanding during the applicable period. For the three months ended December 29, 2018, the tangible equity units (TEUs) were assumed to be settled at the minimum settlement amount of 1.9841 shares per TEU when calculating weighted-average common shares outstanding for purposes of basic earnings per share.

Using the treasury stock method, diluted earnings per share includes the potentially dilutive effect of common shares issued in connection with outstanding stock-based compensation options and grants. The potentially dilutive effect of common shares issued in connection with outstanding stock options is determined based on the average market price for the period. For the three months ended December 29, 2018 diluted earnings per share, the TEUs were assumed to be settled at a conversion factor based on our daily volume-weighted average price per share of our common stock for the 20 consecutive trading days preceding the end of the current fiscal quarter not to exceed 2.3810 shares of common stock per TEU.

Under the treasury stock method, shares associated with certain stock options have been excluded from the diluted weighted average shares outstanding calculation because the exercise of those options would lead to a net reduction in common shares outstanding or anti-dilution. As a result, stock options to acquire 858 and 930 weighted common shares have been excluded from the diluted weighted average common shares outstanding calculation for the three months ended December 28, 2019 and December 29, 2018, respectively.

In connection with the pricing of the TEUs, we purchased capped calls. For the three months ended December 29, 2018, the capped calls were not reflected in the calculation of diluted earnings per share as they had not yet settled, therefore, led to a net

reduction in common shares outstanding or anti-dilution. The capped calls were settled in the fourth quarter of fiscal year 2019 in conjunction with the settlement of the TEUs.

Basic and diluted earnings per share are calculated as follows:

	Three Months Ended	
	December 28, 2019	December 29, 2018
Net income	\$ 5,306	\$ 10,501
Weighted average common shares outstanding	19,146	19,216
Effect of dilutive securities		
Stock-based compensation	223	148
Tangible equity units	—	192
Weighted average dilutive common shares outstanding	19,369	19,556
Earnings per share		
Basic	\$ 0.28	\$ 0.55
Diluted	0.27	0.54

NOTE 13 OTHER COMPREHENSIVE INCOME (LOSS)

Other comprehensive income (loss), a component of shareholders' equity, consists of foreign currency translation adjustments, gains or losses on derivative instruments and defined benefit pension plan adjustments.

Income tax expense or benefit allocated to each component of other comprehensive income (loss) is as follows:

	Three Months Ended		
	December 28, 2019		
	Pre-tax	Tax	Net
Foreign currency translation gain (loss) adjustments	\$ 3,547	\$ —	\$ 3,547
Derivative instruments			
Unrealized net gain (loss)	(150)	36	(114)
Net (gain) loss reclassified to earnings	(320)	70	(250)
Defined benefit pension plan			
Unrealized net gain (loss)	550	(166)	384
Net (gain) loss reclassified to earnings	302	(90)	212
Currency exchange rate gain (loss)	(182)	—	(182)
Other comprehensive income (loss)	\$ 3,747	\$ (150)	\$ 3,597

	Three Months Ended		
	December 29, 2018		
	Pre-tax	Tax	Net
Foreign currency translation gain (loss) adjustments	\$ (1,503)	\$ —	\$ (1,503)
Derivative instruments			
Unrealized net gain (loss)	(1,811)	395	(1,416)
Net (gain) loss reclassified to earnings	(1,169)	255	(914)
Defined benefit pension plan			
Unrealized net gain (loss)	(2,213)	668	(1,545)
Net (gain) loss reclassified to earnings	137	(41)	96
Currency exchange rate gain (loss)	115	—	115
Other comprehensive income (loss)	\$ (6,444)	\$ 1,277	\$ (5,167)

The changes in the net-of-tax balances of each component of AOCI are as follows:

	Three Months Ended			
	December 28, 2019			
	Adjustments			
	Foreign Currency Translation	Unrealized Derivative Instrument	Defined Benefit Pension Plan	Total
Beginning balance	\$ (8,208)	\$ 1,274	\$ (11,539)	\$ (18,473)
Other comprehensive net gain (loss) reclassifications	3,547	(114)	202	3,635
Net (gain) loss reclassified to earnings	—	(250)	212	(38)
Other comprehensive income (loss)	3,547	(364)	414	3,597
Ending balance	\$ (4,661)	\$ 910	\$ (11,125)	\$ (14,876)

	Three Months Ended			
	December 29, 2018			
	Adjustments			
	Foreign Currency Translation	Unrealized Derivative Instrument	Defined Benefit Pension Plan	Total
Beginning balance	\$ 1,772	\$ 6,320	\$ (6,616)	\$ 1,476
Other comprehensive net gain (loss) reclassifications	(1,503)	(1,416)	(1,430)	(4,349)
Net (gain) loss reclassified to earnings	—	(914)	96	(818)
Other comprehensive income (loss)	(1,503)	(2,330)	(1,334)	(5,167)
Ending balance	\$ 269	\$ 3,990	\$ (7,950)	\$ (3,691)

The effect on certain line items in the Consolidated Statements of Income of amounts reclassified out of AOCI are as follows:

	Three Months Ended		Affected Line Item in the Consolidated Statements of Income
	December 28, 2019	December 29, 2018	
Derivative instruments			
Currency exchange contracts gain (loss)	\$ 19	\$ 585	Revenue
Interest rate swap contracts gain (loss)	301	584	Interest expense, net
Income tax benefit (expense)	(70)	(255)	Income tax provision (benefit)
Total net gain (loss) on derivative instruments	250	914	Net income
Defined benefit pension plan			
Actuarial loss	(302)	(137)	Other income (expense), net
Income tax benefit	90	41	Income tax provision (benefit)
Total net loss on pension plan	(212)	(96)	Net income
Total net of tax reclassifications out of AOCI included in net income	\$ 38	\$ 818	

NOTE 14 BUSINESS SEGMENT INFORMATION

Our Chief Executive Officer (the Chief Operating Decision Maker) regularly reviews financial information for our two reportable segments, Test & Simulation and Sensors. Test & Simulation manufactures and sells equipment and related software and services which are used by customers to characterize a product's mechanical properties or performance. Sensors manufactures and sells high-performance sensors which provide measurements of vibration, pressure, position, force and sound in a variety of applications.

In evaluating each segment's performance, our Chief Executive Officer focuses on income from operations. This measure excludes interest income and expense, income taxes and other non-operating items. Corporate expenses, including costs associated with various support functions such as human resources, information technology, legal, finance and accounting, and general and administrative costs are allocated to the reportable segments on the basis of revenue. The accounting policies of the reportable segments are the same as those described in Note 1 and Note 3 to the Consolidated Financial Statements found in our Annual Report on Form 10-K for the fiscal year ended September 28, 2019.

Intersegment revenue is based on standard costs with reasonable mark-ups established between the reportable segments. All significant intersegment amounts are eliminated to arrive at consolidated financial results.

Financial information by reportable segment is as follows:

	Three Months Ended	
	December 28, 2019	December 29, 2018
Revenue		
Test & Simulation	\$ 120,730	\$ 125,560
Sensors	85,535	77,950
Intersegment eliminations	(422)	(329)
Total revenue	\$ 205,843	\$ 203,181
Income from operations		
Test & Simulation	\$ 6,996	\$ 7,331
Sensors	8,159	10,634
Intersegment eliminations	3	1
Total income from operations	\$ 15,158	\$ 17,966

NOTE 15 BUSINESS ACQUISITIONS***E2M Technologies B.V. Acquisition***

On November 21, 2018, we acquired all ownership interests of E2M Technologies B.V. (E2M) for a cash purchase price of \$80,287. Based in Amsterdam, Netherlands, E2M is a leading manufacturer of high force, electrically driven actuation systems, serving primarily the human-rated entertainment and training simulation markets. The acquisition of E2M expands our technology and product offerings for human-rated simulation systems and brings key regulatory approvals and customers in the flight simulation and entertainment markets. The transaction was accounted for under the acquisition method of accounting. The acquired assets, liabilities and operating results have been included in our financial statements within Test & Simulation from the date of acquisition. During fiscal year 2019, we included \$29,554 of revenue from E2M in our Consolidated Statements of Income. We funded the acquisition of E2M primarily with borrowings on our Revolving Credit Facility. Costs of \$1,287 associated with the acquisition of E2M were expensed as incurred. Pro forma information related to the acquisition of E2M has not been included as the impact on our consolidated results of operations was not considered material.

The following table summarizes the fair value measurement of the assets acquired and liabilities assumed, net of cash acquired, as of the date of acquisition:

Asset (Liability)	Fair Value	Finite-Lived Intangible Asset Lives (Years)
Accounts receivable	\$ 4,651	
Unbilled accounts receivable	1,518	
Inventories	11,063	
Prepaid expenses and other current assets	123	
Property and equipment	672	
Intangible assets		
Customer lists	21,652	15
Trademarks and trade names	5,926	15
Technology	12,650	15
Other intangible assets	3,761	4
Other long-term assets	60	
Purchased goodwill	36,665	
Accounts payable	(3,657)	
Accrued payroll and related costs	(1,328)	
Advance payments from customers	(4,315)	
Accrued income taxes	(290)	
Other accrued liabilities	(127)	
Deferred income taxes	(10,477)	
Net assets acquired	\$ 78,547	
Supplemental information		
Consideration paid at closing	\$ 79,772	
Post-closing purchase price adjustment	515	
Less: Cash acquired	(1,740)	
Purchase price, net of cash acquired	\$ 78,547	

The fair value measurement was completed as of September 28, 2019. Measurement period adjustments were recorded in fiscal year 2019 and have been reflected in the table above.

Goodwill was calculated as the difference between the acquisition date fair value of the total purchase price consideration and the fair value of the net assets acquired and represents the future economic benefits that we expect to achieve as a result of the acquisition. This resulted in a purchase price in excess of the fair value of identifiable net assets acquired. The purchase price

also included the fair value of other assets that were not identifiable, not separately recognizable under accounting rules (e.g., assembled workforce) or of immaterial value. All of the goodwill was assigned to Test & Simulation. None of the goodwill is deductible for income tax purposes.

The fair value of the acquired intangible assets was \$43,989. The acquired intangible assets are being amortized on a straight-line basis over the useful lives identified in the table above.

Endevco Acquisition

On August 5, 2019, we acquired the Endevco sensors business (Endevco) from Meggitt PLC for a cash purchase price of \$68,330. We funded the acquisition of Endevco through cash on hand. Endevco is a historic leader in high performance test and measurement sensors used primarily in the testing of new products. This strategic product line purchase brings together two iconic brands in the test and measurement sensors market, in PCB and Endevco, and further enhances our long-term strategy of growth and market leadership in our core businesses. The transaction was accounted for under the acquisition method of accounting. The acquired assets and operating results have been included in our financial statements within Sensors from the date of acquisition. During the three months ended December 28, 2019, we included approximately \$3,300 of revenue from Endevco in our Consolidated Statements of Income. Pro forma information related to the acquisition of Endevco has not been included as the impact on our consolidated results of operations was not considered material.

The following table summarizes the preliminary fair value measurement of the assets acquired as of the date of acquisition:

Asset	Fair Value	Finite-Lived Intangible Asset Lives (Years)
Inventories	\$ 11,649	
Property and equipment	1,078	
Intangible assets		
Customer lists	13,500	15
Trademarks and trade names	7,900	15
Technology	4,400	15
Purchased goodwill	23,246	
Deferred income taxes	6,557	
Net assets acquired	\$ 68,330	
Supplemental information		
Consideration paid at closing	\$ 70,000	
Post-closing purchase price adjustment	(1,670)	
Purchase price	\$ 68,330	

The allocation of purchase price consideration is considered preliminary as of December 28, 2019 with provisional amounts related to inventory, property and equipment, intangible assets, deferred income taxes and purchase price adjustments included as our allocation process has not been finalized. We expect to finalize the allocation of purchase price as soon as possible, but no later than one year from the acquisition date.

Goodwill was calculated as the difference between the acquisition date fair value of the total purchase price consideration and the fair value of the net assets acquired and represents the future economic benefits that we expect to achieve as a result of the acquisition. This resulted in a purchase price in excess of the fair value of identifiable assets acquired. The purchase price also included the fair value of other assets that were not identifiable, not separately recognizable under accounting rules (e.g., assembled workforce) or of immaterial value. All of the goodwill was assigned to Sensors. All of the goodwill is deductible for income tax purposes.

The fair value of the acquired intangible assets was \$25,800. The acquired intangible assets are being amortized on a straight-line basis over the useful lives identified in the table above.

NOTE 16 SUBSEQUENT EVENTS

On November 22, 2019, we signed a definitive agreement to acquire 100% of the stock of R&D Test Systems, R&D Engineering, R&D Steel, R&D Prague, RGDK Engineering Private Limited and R&D Tools and Structures (collectively, "R&D") for approximately \$80,000, subject to working capital and other adjustments. On January 24, 2020, we closed the acquisition of three R&D entities, specifically R&D Test Systems, R&D Engineering and R&D Steel, for a cash purchase price of approximately \$83,000. Based out of Denmark, R&D is a leader in high-quality, durable, rotating test systems, serving primarily the wind energy markets. As a strategic addition to Test & Simulation, the three entities acquired resulted in an upfront payment of approximately \$57,000 primarily funded through our existing Revolving Credit Facility, with expected earn-out payments of up to an additional \$26,000 based on financial performance through June 2021. Acquisition of the remaining three entities, R&D Prague, RGDK Engineering Private Limited and R&D Tools and Structures, for approximately \$1,000, remains subject to final closing conditions.

Item 2. Management's Discussion and Analysis of Financial Condition and Results of Operations

Management's Discussion and Analysis of Financial Condition and Results of Operations (MD&A) is designed to provide a reader of our financial statements with a narrative from the perspective of management on our financial condition, results of operations, liquidity and certain other factors that may affect our future results. Our MD&A is presented in nine sections:

- Overview
- Financial Results
- Cash Flow Comparison
- Liquidity and Capital Resources
- Off-balance Sheet Arrangements
- Critical Accounting Policies
- Recently Issued Accounting Pronouncements
- Other Matters
- Forward-looking Statements

Our MD&A should be read in conjunction with the Consolidated Financial Statements and related Notes included in Item 1 of Part I of this Quarterly Report on Form 10-Q. All dollar and share amounts are in thousands, unless otherwise noted.

Overview

Our testing and simulation hardware, software and service solutions simulate real world environments in other than real world settings thereby enabling customers to improve design, development and manufacturing processes, determine the mechanical behavior of materials, products and structures, or create a desired human experience such as amusement rides, vehicle simulators or flight training simulators. Our high-performance sensors provide measurements of vibration, pressure, position, force and sound in a variety of applications.

Further globalization and expansion of many industries along with growth in emerging markets, such as China and India, provide a strong and vibrant market base from which we can grow revenue. We have aligned our organizational structure to be more flexible to the demands of globalized and volatile markets by adjusting our structure to be more cost effective and nimble in responding to our customers' needs. We continue to deliver distinctive business performance through our commitment to sustain the differentiated competitive advantage that comes from offering an innovative portfolio of Test & Simulation and Sensor solutions that create value for customers, delivered with total customer satisfaction.

Acquisition

On November 22, 2019, we signed a definitive agreement to acquire R&D for approximately \$80,000, subject to working capital and other adjustments. On January 24, 2020, we closed the acquisition of three R&D entities, specifically R&D Test Systems, R&D Engineering and R&D Steel, for a cash purchase price of approximately \$83,000. See Note 16 to the Consolidated Financial Statements included in Item 1 of Part I of this Quarterly Report on Form 10-Q for further discussion of the acquisition of R&D.

Financing

On November 1, 2019, we amended the Credit Agreement, increased the size of our Revolving Credit Facility from \$150,000 to \$200,000, extended the expiration date to July 5, 2023, reduced letter of credit commitments and modified certain financial covenants. See Note 9 to the Consolidated Financial Statements included in Item 1 of Part I of this Quarterly Report on Form 10-Q for further discussion of the amendment to the Credit Agreement.

Foreign Currency

Over the past 15 years, approximately 70% of our revenue has been derived from customers outside of the U.S. Our financial results are principally exposed to changes in exchange rates between the U.S. dollar and the Euro, the Japanese yen and the Chinese yuan. A change in foreign exchange rates could positively or negatively affect our reported financial results. The discussion below quantifies the impact of foreign currency translation on our financial results for the periods discussed.

Terms

The terms "MTS," "we," "us," "the Company" or "our" in this Quarterly Report on Form 10-Q, unless the context otherwise requires, refer to MTS Systems Corporation and its wholly owned subsidiaries.

Financial Results

Total Company

Results of Operations

The following tables compare results of operations, separately identifying the estimated impact of currency translation.

	Three Months Ended			
	December 28, 2019	Estimated		December 29, 2018
		Business Change	Currency Translation	
Revenue	\$ 205,843	\$ 4,432	\$ (1,770)	\$ 203,181
Cost of sales	129,234	5,554	(1,196)	124,876
Gross profit	76,609	(1,122)	(574)	78,305
Gross margin	37.2%			38.5%
Operating expenses				
Selling and marketing	32,719	884	(254)	32,089
General and administrative	21,693	747	(132)	21,078
Research and development	7,039	(98)	(35)	7,172
Total operating expenses	61,451	1,533	(421)	60,339
Income from operations	\$ 15,158	\$ (2,655)	\$ (153)	\$ 17,966

Revenue

	Three Months Ended			
	December 28, 2019	December 29, 2018	Increased / (Decreased)	
			\$	%
Revenue	\$ 205,843	\$ 203,181	\$ 2,662	1.3%

Revenue for the three months ended December 28, 2019 increased 1.3% primarily driven by growth in the Sensors business, partially offset by a decline in the Test & Simulation business and the unfavorable impact of currency translation. Sensors revenue for the three months ended December 28, 2019 increased \$7,585 driven by growth in the Sensors test sector primarily from a multi-year contract with the U.S. Department of Defense and the Endeveco acquisition, partially offset by weakness in the Sensors position sector, specifically in the European region, and the unfavorable impact of currency translation. Test & Simulation revenue for the three months ended December 28, 2019 decreased \$4,830 primarily driven by a decline in volume from weakness in the ground vehicles sector, specifically in Europe and Asia, lower service volume and the unfavorable impact of currency translation, partially offset by continued growth in the materials and structures sectors. Excluding the impact of currency translation, revenue increased 2.2%.

Gross Profit

	Three Months Ended			
	December 28, 2019	December 29, 2018	Increased / (Decreased)	
			\$	%
Gross profit	\$ 76,609	\$ 78,305	\$ (1,696)	(2.2)%
Gross margin	37.2%	38.5%	(1.3)	ppts

Gross profit for the three months ended December 28, 2019 declined 2.2% primarily driven by lower revenue volume in Test & Simulation, higher compensation expense and the unfavorable impact of currency translation, partially offset by higher revenue volume in Sensors. Gross margin decreased 1.3 percentage points primarily due to higher compensation expense and lower gross margin contribution from product mix driven by both Test & Simulation and Sensors. Excluding the impact of currency translation and the inventory acquisition adjustments in both fiscal years, gross profit declined 1.3% and gross margin declined 1.4 percentage points.

Selling and Marketing Expense

	Three Months Ended		Increased / (Decreased)	
	December 28, 2019	December 29, 2018	\$	%
	Selling and marketing	\$ 32,719	\$ 32,089	\$ 630
% of revenue	15.9%	15.8%		

Selling and marketing expense for the three months ended December 28, 2019 increased 2.0% primarily due to higher compensation expense to support sales growth in Sensors, partially offset by lower commission expense from fewer orders in Test & Simulation and the favorable impact of currency translation. Excluding the impact of currency translation, selling and marketing expense increased 2.8%.

General and Administrative Expense

	Three Months Ended		Increased / (Decreased)	
	December 28, 2019	December 29, 2018	\$	%
	General and administrative	\$ 21,693	\$ 21,078	\$ 615
% of revenue	10.5%	10.4%		

General and administrative expense for the three months ended December 28, 2019 increased 2.9% primarily due to R&D and Endevco acquisition-related expenses of \$1,746 and higher compensation expense in Sensors, partially offset by lower compensation expense in Test & Simulation and E2M acquisition-related expenses of \$761 in the prior year. Excluding the impact of currency translation and acquisition-related expenses in both fiscal years, general and administrative expense decreased 1.2%.

Research and Development Expense

	Three Months Ended		Increased / (Decreased)	
	December 28, 2019	December 29, 2018	\$	%
	Research and development	\$ 7,039	\$ 7,172	\$ (133)
% of revenue	3.4%	3.5%		

Research and development expense for the three months ended December 28, 2019 declined 1.9% primarily due to the shift of internal resources to larger, capitalizable Test & Simulation projects, partially offset by continued investment in new product development and the acquisition of Endevco. Excluding the impact of currency translation, research and development expense decreased 1.4%.

Income from Operations

	Three Months Ended		Increased / (Decreased)	
	December 28, 2019	December 29, 2018	\$	%
	Income from operations	\$ 15,158	\$ 17,966	\$ (2,808)
% of revenue	7.4%	8.8%		

Income from operations for the three months ended December 28, 2019 declined 15.6% primarily due to lower gross profit, additional acquisition-related expenses in the current year and higher selling compensation expense in Sensors, partially offset by lower operating compensation expense in Test & Simulation. Excluding the impact of currency translation and the inventory acquisition adjustments and acquisition-related expenses in both fiscal years, income from operations decreased 8.2%.

Interest Expense, Net

	Three Months Ended		Increased / (Decreased)	
	December 28, 2019	December 29, 2018	\$	%
Interest expense, net	\$ 8,272	\$ 6,818	\$ 1,454	21.3%

Interest expense, net for the three months ended December 28, 2019 increased primarily due to higher interest expense on an increased debt position related to the issuance of the Notes in the fourth quarter of fiscal year 2019.

Other Income (Expense), Net

	Three Months Ended		Increased / (Decreased)	
	December 28, 2019	December 29, 2018	\$	%
Other income (expense), net	\$ (431)	\$ 49	\$ (480)	(979.6)%

The decrease in other income (expense), net for the three months ended December 28, 2019 was primarily driven by a relative increase in losses on foreign currency transactions.

Income Tax Provision (Benefit)

	Three Months Ended		Increased / (Decreased)	
	December 28, 2019	December 29, 2018	\$	%
Income tax provision (benefit)	\$ 1,149	\$ 696	\$ 453	65.1%
Effective tax rate	17.8%	6.2%		

The effective tax rate for the three months ended December 28, 2019 increased primarily due to certain discrete benefits of \$1,293 in the prior year for the impacts of the Tax Act. Excluding the impact of these discrete items, the effective tax rate for the three months ended December 29, 2018 would have been 17.8%, consistent with the current year effective tax rate.

Net Income

	Three Months Ended		Increased / (Decreased)	
	December 28, 2019	December 29, 2018	\$	%
Net income	\$ 5,306	\$ 10,501	\$ (5,195)	(49.5)%
Diluted earnings per share	\$ 0.27	\$ 0.54	\$ (0.27)	(50.0)%

Net income and diluted earnings per share for the three months ended December 28, 2019 decreased primarily due to lower income from operations in both Test & Simulation and Sensors, increased interest expense and an increase in the effective tax rate.

Segment Results
Test & Simulation Segment
Results of Operations

The following tables compare results of operations for Test & Simulation, separately identifying the estimated impact of currency translation. See Note 14 to the Consolidated Financial Statements included in Item 1 of Part I of this Quarterly Report on Form 10-Q for additional information on our reportable segments.

	Three Months Ended			
	December 28, 2019	Estimated		December 29, 2018
		Business Change	Currency Translation	
Revenue	\$ 120,730	\$ (3,882)	\$ (948)	\$ 125,560
Cost of sales	83,760	(1,533)	(722)	86,015
Gross profit	36,970	(2,349)	(226)	39,545
Gross margin	30.6%			31.5%
Operating expenses				
Selling and marketing	16,879	(374)	(95)	17,348
General and administrative	11,005	(968)	(98)	12,071
Research and development	2,090	(693)	(12)	2,795
Total operating expenses	29,974	(2,035)	(205)	32,214
Income from operations	\$ 6,996	\$ (314)	\$ (21)	\$ 7,331

Revenue

	Three Months Ended		Increased / (Decreased)	
	December 28, 2019	December 29, 2018	\$	%
Revenue	\$ 120,730	\$ 125,560	\$ (4,830)	(3.8)%

Revenue for the three months ended December 28, 2019 decreased 3.8% primarily driven by a decline in volume from weakness in the ground vehicles sector, specifically in Europe and Asia, lower service volume and the unfavorable impact of currency translation, partially offset by continued growth in the materials and structures sectors. Excluding the impact of currency translation, revenue decreased 3.1%.

Gross Profit

	Three Months Ended		Increased / (Decreased)	
	December 28, 2019	December 29, 2018	\$	%
Gross profit	\$ 36,970	\$ 39,545	\$ (2,575)	(6.5)%
Gross margin	30.6%	31.5%	(0.9) pts	

Gross profit for the three months ended December 28, 2019 declined 6.5% primarily due to lower revenue volume and higher compensation expense as part of normal inflation. Gross margin declined 0.9 percentage points primarily driven by higher compensation expense and lower gross margin contribution from product mix, partially offset by the E2M inventory acquisition adjustment of \$445 in the prior year. Excluding the impact of currency translation and the inventory acquisition adjustment in the prior year, gross profit declined 7.0% and gross margin declined 1.2 percentage points.

Selling and Marketing Expense

	Three Months Ended		Increased / (Decreased)	
	December 28, 2019	December 29, 2018	\$	%
Selling and marketing	\$ 16,879	\$ 17,348	\$ (469)	(2.7)%
% of revenue	14.0%	13.8%		

Selling and marketing expense for the three months ended December 28, 2019 declined 2.7% primarily due to lower commission expense from fewer orders. Excluding the impact of currency translation, selling and marketing expense decreased 2.2%.

General and Administrative Expense

	Three Months Ended		Increased / (Decreased)	
	December 28, 2019	December 29, 2018	\$	%
General and administrative	\$ 11,005	\$ 12,071	\$ (1,066)	(8.8)%
% of revenue	9.1%	9.6%		

General and administrative expense for the three months ended December 28, 2019 declined 8.8% primarily driven by lower compensation expense due to headcount reductions, E2M acquisition-related expenses incurred in the prior year of \$761 and lower professional fees, partially offset by R&D acquisition-related expenses of \$867. Excluding the impact of currency translation and acquisition-related expenses incurred in both fiscal years, general and administrative expense decreased 9.5%.

Research and Development Expense

	Three Months Ended		Increased / (Decreased)	
	December 28, 2019	December 29, 2018	\$	%
Research and development	\$ 2,090	\$ 2,795	\$ (705)	(25.2)%
% of revenue	1.7%	2.2%		

Research and development expense for the three months ended December 28, 2019 declined 25.2% primarily due to the shift of internal resources to larger, capitalizable Test & Simulation projects, partially offset by continued investment in new product development. Excluding the impact of currency translation, research and development expense decreased 24.8%.

Income from Operations

	Three Months Ended		Increased / (Decreased)	
	December 28, 2019	December 29, 2018	\$	%
Income from operations	\$ 6,996	\$ 7,331	\$ (335)	(4.6)%
% of revenue	5.8%	5.8%		

Income from operations for the three months ended December 28, 2019 declined 4.6% primarily due to decreased gross profit on lower revenue volume and R&D acquisition-related expenses of \$867, partially offset by lower operating compensation expense and the E2M inventory acquisition adjustment in the prior year. Excluding the impact of currency translation, the inventory acquisition adjustment in the prior year and acquisition-related expenses in both fiscal years, income from operations decreased 7.6%.

Sensors Segment

Results of Operations

The following tables compare results of operations for Sensors, separately identifying the estimated impact of currency translation. See Note 14 to the Consolidated Financial Statements included in Item 1 of Part I of this Quarterly Report on Form 10-Q for additional information on our reportable segments.

	Three Months Ended			
	December 28, 2019	Estimated		December 29, 2018
		Business Change	Currency Translation	
Revenue	\$ 85,535	\$ 8,407	\$ (822)	\$ 77,950
Cost of sales	45,899	7,182	(474)	39,191
Gross profit	39,636	1,225	(348)	38,759
Gross margin	46.3%			49.7%
Operating expenses				
Selling and marketing	15,840	1,258	(159)	14,741
General and administrative	10,688	1,715	(34)	9,007
Research and development	4,949	595	(23)	4,377
Total operating expenses	31,477	3,568	(216)	28,125
Income (loss) from operations	\$ 8,159	\$ (2,343)	\$ (132)	\$ 10,634

Revenue

	Three Months Ended		Increased / (Decreased)	
	December 28, 2019	December 29, 2018	\$	%
Revenue	\$ 85,535	\$ 77,950	\$ 7,585	9.7%

Revenue for the three months ended December 28, 2019 increased 9.7% driven by growth in the Sensors test sector primarily from a multi-year contract with the U.S. Department of Defense and the Endevo acquisition, partially offset by weakness in the Sensors position sector, specifically in the European region, and the unfavorable impact of currency translation. Excluding the impact of currency translation, revenue increased 10.8%.

Gross Profit

	Three Months Ended		Increased / (Decreased)	
	December 28, 2019	December 29, 2018	\$	%
Gross profit	\$ 39,636	\$ 38,759	\$ 877	2.3%
Gross margin	46.3%	49.7%	(3.4)	ppts

Gross profit for the three months ended December 28, 2019 increased 2.3% primarily due to increased revenue volume, partially offset by the Endevo inventory acquisition adjustment of \$540, higher compensation expense and the unfavorable impact of currency translation. Gross margin declined 3.4 percentage points primarily driven by lower gross margin contribution from product mix, higher compensation expense during the ramp-up of manufacturing capacity to support new products, growth in order volume in a tight labor market and the Endevo inventory acquisition adjustment. Excluding the impact of currency translation and the integration of Endevo into existing manufacturing facilities and the Endevo inventory acquisition adjustment, gross profit increased 4.6% and gross margin declined 2.8 percentage points.

Selling and Marketing Expense

	Three Months Ended		Increased / (Decreased)	
	December 28, 2019	December 29, 2018	\$	%
Selling and marketing	\$ 15,840	\$ 14,741	\$ 1,099	7.5%
% of revenue	18.5%	18.9%		

Selling and marketing expense for the three months ended December 28, 2019 increased 7.5% primarily driven by higher compensation from headcount additions to support sales growth, partially offset by the favorable impact of currency translation. Excluding the impact of currency translation, selling and marketing expense increased 8.5%.

General and Administrative Expense

	Three Months Ended		Increased / (Decreased)	
	December 28, 2019	December 29, 2018	\$	%
General and administrative	\$ 10,688	\$ 9,007	\$ 1,681	18.7%
% of revenue	12.5%	11.6%		

General and administrative expense for the three months ended December 28, 2019 increased 18.7% primarily driven by acquisition-related expenses of \$879 and higher compensation expense due to planned headcount additions. Excluding the impact of currency translation and acquisition-related expenses, general and administrative expense increased 9.3%.

Research and Development Expense

	Three Months Ended		Increased / (Decreased)	
	December 28, 2019	December 29, 2018	\$	%
Research and development	\$ 4,949	\$ 4,377	\$ 572	13.1%
% of revenue	5.8%	5.6%		

Research and development expense for the three months ended December 28, 2019 increased 13.1% primarily driven by continued investment in new product development and the acquisition of Endevco. Excluding the impact of currency translation, research and development expense increased 13.6%.

Income from Operations

	Three Months Ended		Increased / (Decreased)	
	December 28, 2019	December 29, 2018	\$	%
Income from operations	\$ 8,159	\$ 10,634	\$ (2,475)	(23.3)%
% of revenue	9.5%	13.6%		

Income from operations for the three months ended December 28, 2019 declined 23.3% primarily due to additional expenses related to the Endevco acquisition and higher compensation expense, partially offset by increased gross profit on higher revenue volume. Excluding the impact of currency translation, the Endevco inventory acquisition adjustment and acquisition-related expenses, income from operations decreased 8.7%.

Cash Flow Comparison

The following table summarizes our cash flows from total operations:

	Three Months Ended	
	December 28, 2019	December 29, 2018
Total cash provided by (used in):		
Operating activities	\$ (5,743)	\$ 10,631
Investing activities	(10,572)	(82,080)
Financing activities	21,532	70,595
Effect of exchange rate changes on cash and cash equivalents	917	(512)
Increase (decrease) in cash and cash equivalents during the period	6,134	(1,366)
Cash and cash equivalents balance, beginning of period	57,937	71,804
Cash and cash equivalents balance, end of period	\$ 64,071	\$ 70,438

Operating Activities

The increase in cash used by operating activities was primarily due to an increase in cash used by other assets and liabilities related to accrued project costs, as well as an increase in cash used by working capital associated with timing fluctuations from advanced payments received from customers, accounts receivable payments received and unbilled accounts receivable accruals, accounts payable payments, and inventory purchases.

Investing Activities

The decrease in cash used in investing activities was primarily due to the acquisition of E2M in the first quarter of fiscal year 2019, partially offset by an increase in cash used to purchase property and equipment for continued strategic investments in the business.

Financing Activities

The decrease in cash provided by financing activities was primarily due to borrowings under the Revolving Credit Facility used to fund the acquisition of E2M in the first quarter of fiscal year 2019, partially offset by an increase in short-term borrowings under the Revolving Credit Facility.

Liquidity and Capital Resources

We had cash and cash equivalents of \$64,071 as of December 28, 2019. Of this amount, \$7,052 was located in North America, \$26,299 in Europe and \$30,720 in Asia. Repatriation of certain foreign earnings is restricted by local law. The North American cash balance was primarily invested in bank deposits. The cash balances in Europe and Asia were primarily invested in money market funds and bank deposits. In accordance with our investment policy, we place cash equivalent investments with issuers who have high-quality investment credit ratings. In addition, we limit the amount of investment exposure we have with any particular issuer. Our investment objectives are to preserve principal, maintain liquidity and achieve the best available return consistent with our primary objectives of safety and liquidity. As of December 28, 2019, we held no short-term investments.

As a result of the transition tax related to the enactment of the Tax Act, we are able to repatriate cash held in our foreign subsidiaries without such funds being subject to additional federal income tax liability. We plan to continue to repatriate certain amounts of our existing offshore cash and future earnings back to the U.S.

As of December 28, 2019, our capital structure was comprised of \$59,600 in short-term debt, \$492,945 in long-term debt and \$488,748 in shareholders' equity. The Consolidated Balance Sheets also included \$11,835 of unamortized debt issuance costs as of December 28, 2019. Total interest-bearing debt as of December 28, 2019 was \$552,545.

We have a credit agreement with a consortium of financial institutions (the Credit Agreement) that provides for senior secured credit facilities consisting of a Revolving Credit Facility and a Term Facility. The maturity date of the Revolving Credit Facility and the loans under the Term Facility is July 5, 2023, unless a term loan lender agrees to extend the maturity date pursuant to a loan modification agreement made in accordance with the terms of the Credit Agreement. The Credit Agreement also requires mandatory prepayments on our Term Facility in certain circumstances, including the potential for an annual required prepayment of a certain percentage of our excess cash flow.

Under the Credit Agreement, we are subject to customary affirmative and negative covenants, including, among others, restrictions on our ability to incur debt, create liens, dispose of assets, make investments, loans, advances, guarantees and acquisitions, enter into transactions with affiliates and enter into any restrictive agreements and customary events of default

(including payment defaults, covenant defaults, change of control defaults and bankruptcy defaults). The Credit Agreement also contains financial covenants, including the ratio of consolidated total indebtedness to adjusted consolidated earnings before interest, taxes, depreciation and amortization (Adjusted EBITDA), as defined in the Credit Agreement, as well as the ratio of Adjusted EBITDA to consolidated interest expense. These covenants restrict our ability to pay dividends and purchase outstanding shares of common stock. As of December 28, 2019, we were in compliance with these financial covenants.

In fiscal year 2019, we issued \$350,000 in aggregate principal amount of 5.750% senior unsecured notes due in 2027 (the Notes). The Notes were issued pursuant to an Indenture among us, the Guarantors (as defined therein) and Wells Fargo Bank, National Association, as trustee (the Indenture). The Notes will mature on August 15, 2027.

The Indenture governing the Notes contains covenants that limit, among other things, our ability and the ability of our restricted subsidiaries to incur additional indebtedness or issue certain preferred shares; create liens; pay dividends, redeem stock or make other distributions; make investments; for our restricted subsidiaries to pay dividends to us or make other intercompany transfers; transfer or sell assets; merge or consolidate; enter into certain transactions with our affiliates; and designate subsidiaries as unrestricted subsidiaries. As of December 28, 2019, we were in compliance with these financial covenants.

See Note 9 to the Consolidated Financial Statements included in Item I of Part I of this Quarterly Report on Form 10-Q for additional information on our financing arrangements.

Shareholders' equity increased by \$4,689 during the three months ended December 28, 2019 primarily due to \$5,306 net income, \$2,328 stock-based compensation and \$3,597 other comprehensive loss. The increase was partially offset by \$5,748 dividends declared.

As of December 28, 2019, we believe our current capital resources will be sufficient to fund working capital requirements, capital expenditures and operations for the foreseeable future, including at least the next twelve months.

Off-balance Sheet Arrangements

As of December 28, 2019, we did not have any off-balance sheet arrangements that have, or are reasonably likely to have, a current or future material effect on our financial condition, revenues or expenses, results of operations, liquidity, capital expenditures or capital resources that are material to investors.

Critical Accounting Policies

The Consolidated Financial Statements have been prepared in accordance with GAAP, which requires us to make estimates and assumptions in certain circumstances that affect amounts reported, giving due consideration to materiality, that affect the reported amounts of assets and liabilities, revenues and expenses and related disclosures of any contingent assets and liabilities at the date of the financial statements. We regularly review our estimates and assumptions, which are based on historical experience and on various other factors that are believed to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions. For further information, see Note 1 and Note 3 to the Consolidated Financial Statements included in Item 8 of our Annual Report on Form 10-K for the fiscal year ended September 28, 2019. For a discussion of our critical accounting policies, see "Management's Discussion and Analysis of Financial Condition and Results of Operations" in Item 7 of Part II of our Annual Report on Form 10-K for the fiscal year ended September 28, 2019.

Recently Issued Accounting Pronouncements

Information regarding new accounting pronouncements is included in Note 2 and Note 5 to the Consolidated Financial Statements included in Item 1 of Part I of this Quarterly Report on Form 10-Q.

Other Matters

Dividends

Our dividend policy is to maintain a payout ratio that allows dividends to increase in conjunction with the long-term growth of earnings per share, while sustaining dividends through economic cycles. Our dividend practice is to target, over time, a payout ratio of approximately 25% of net earnings per share. We have historically paid dividends to holders of our common stock on a quarterly basis. The declaration and payment of future dividends will depend on many factors, including, but not limited to, our earnings, financial condition, debt repayment obligations, business development needs and regulatory considerations and are at the discretion of our Board of Directors.

Forward-looking Statements

Statements contained in this Quarterly Report on Form 10-Q including, but not limited to, the discussion under Item 2, Management's Discussion and Analysis of Financial Condition and Results of Operations, that are not statements of historical

fact are forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995 (the Act). In addition, certain statements in our future filings with the SEC, in press releases and in oral and written statements made by us or with our approval that are not statements of historical fact also constitute forward-looking statements. Examples of forward-looking statements include, but are not limited to: (i) projections of revenue, ROIC, Adjusted EBITDA, net income or loss, earnings or loss per share, the payment or nonpayment of dividends, our capital structure, the adequacy of our liquidity and reserves, the anticipated level of expenditures required and other statements concerning future financial performance; (ii) statements of our plans and objectives by our management or Board of Directors, including those relating to products or services, our restructuring initiatives, merger or acquisition activity and the potential impact of newly acquired businesses; (iii) statements of assumptions underlying such statements; (iv) statements regarding business relationships with vendors, customers or collaborators or statements relating to our order cancellation history, our ability to convert our backlog of undelivered orders into revenue, the timing of purchases, competitive advantages and growth in end markets; and (v) statements regarding our products and their characteristics, fluctuations in the costs of raw materials for products, our geographic footprint, performance, sales potential or effect in the hands of customers. Words such as "believes," "anticipates," "expects," "intends," "targeted," "should," "potential," "goals," "strategy" and similar expressions are intended to identify forward-looking statements, but are not the exclusive means of identifying such statements.

Forward-looking statements involve risks and uncertainties that may cause actual results to differ materially from those in such statements. Factors that could cause actual results to differ from those discussed in the forward-looking statements include, but are not limited to, those described in Item 1A of Part I of our Annual Report on Form 10-K for the fiscal year ended September 28, 2019 and in Item 1A of Part II of this Quarterly Report on Form 10-Q. The performance of our business and our securities may be adversely affected by these factors and by other factors common to other businesses and investments, or to the general economy. Forward-looking statements are qualified by some or all of these risk factors. Therefore, you should consider these forward-looking statements with caution and form your own critical and independent conclusions about the likely effect of these risk factors on our future performance. Forward-looking statements speak only as of the date on which such statements are made, and we undertake no obligation to update any forward-looking statement to reflect events or circumstances after the date on which such statement is made to reflect the occurrence of unanticipated events or circumstances. You should carefully review the disclosures and the risk factors described in our Annual Report on Form 10-K for the fiscal year ended September 28, 2019 and in other documents we file from time to time with the SEC, including our Quarterly Reports on Form 10-Q and Current Reports on Form 8-K.

Item 3. Quantitative and Qualitative Disclosures About Market Risk

Foreign Currency Exchange Risk

Over the past 15 years, approximately 70% of our revenue has been derived from customers outside of the U.S. Our international subsidiaries have functional currencies other than our U.S. dollar reporting currency and, occasionally, transact business in currencies other than their functional currencies. These non-functional currency transactions expose us to market risk on assets, liabilities and cash flows recognized on these transactions.

The strengthening of the U.S. dollar relative to foreign currencies decreases the value of foreign currency-denominated revenue and earnings when translated into U.S. dollars resulting in an unfavorable currency translation impact on revenue and earnings. Conversely, a weakening of the U.S. dollar increases the value of foreign currency-denominated revenue and earnings resulting in a favorable currency translation impact on revenue and earnings.

A hypothetical 10% appreciation or depreciation in foreign currencies against the U.S. dollar, assuming all other variables are held constant, would result in an increase or decrease in revenue of approximately \$7,680 for the three months ended December 28, 2019.

We have operational procedures to mitigate these non-functional currency exposures. We also utilize foreign currency exchange contracts to exchange currencies at set exchange rates on future dates to offset expected gains or losses on specifically identified exposures.

Mark-to-market gains and losses on derivatives designated as cash flow hedges in our currency hedging program are recorded within accumulated other comprehensive income (loss) (AOCI) in the Consolidated Balance Sheets. Mark-to-market gains and losses are reclassified from AOCI to earnings in the same line item in the Consolidated Statements of Income and in the same period as the recognition of the underlying hedged transaction. Net gains and losses on foreign currency transactions included in the accompanying Consolidated Statements of Income were net losses of \$929 and \$323 during the three months ended December 28, 2019 and December 29, 2018, respectively. See Note 8 to the Consolidated Financial Statements included in Item 1 of Part I of this Quarterly Report on Form 10-Q for additional information on our cash flow hedge currency exchange contracts.

Interest Rates

We are directly exposed to changes in market interest rates on cash, cash equivalents, short-term investments and long-term debt, and are indirectly exposed to the impact of market interest rates on overall business activity.

On floating-rate investments, increases and decreases in market interest rates will increase or decrease future interest income, respectively. On floating-rate debt, increases or decreases in market interest rates will increase or decrease future interest expense, respectively. On fixed-rate investments, increases or decreases in market interest rates do not impact future interest income but may decrease or increase the fair market value of the investments, respectively. On fixed-rate debt, increases or decreases in market interest rates do not impact future interest expense but may decrease or increase the fair market value of the debt, respectively.

As of December 28, 2019, we had cash and cash equivalents of \$64,071, some of which was invested in interest-bearing bank deposits or money market funds. The interest-bearing bank deposits and money market funds have interest rates that reset every 1 to 89 days and generate interest income that will vary based on changes in short-term interest rates. A hypothetical decrease of 100 basis points in market interest rates, assuming all other variables were held constant, would decrease interest income by approximately \$14 for the three months ended December 28, 2019.

As of December 28, 2019, we had floating interest rate debt of \$172,545. Secured floating rate credit facilities require interest payments to be calculated at a floating rate and are therefore impacted by increases or decreases in market interest rates. A hypothetical increase of 100 basis points in floating interest rates, assuming all other variables were held constant, would result in an approximately \$1,708 increase in future annual interest expense.

Item 4. Controls and Procedures

Our management, including our Chief Executive Officer and Chief Financial Officer, has conducted an evaluation of the effectiveness of the design and operation of our disclosure controls and procedures (as defined in Rule 13a-15(e) under the Securities Exchange Act of 1934, as amended (the Exchange Act)), as of December 28, 2019. Based on that evaluation, our Chief Executive Officer and Chief Financial Officer concluded that, as of December 28, 2019, our disclosure controls and procedures were effective.

There were no changes in our internal control over financial reporting during the first quarter of fiscal year 2020 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

PART II – OTHER INFORMATION**Item 1. Legal Proceedings**

We are subject to various claims, legal actions and complaints arising in the ordinary course of business. We are not presently a party to any litigation the outcome of which we believe, if determined adversely to us, would individually or taken together have a material adverse effect on our business, operating results, cash flows or financial condition.

Item 1A. Risk Factors

A discussion of our risk factors can be found in Item 1A of Part I of our Annual Report on Form 10-K for the fiscal year ended September 28, 2019. The risks described in our Annual Report on Form 10-K are not the only risks we face. Additional risks not currently known to us, or that we currently deem to be immaterial, may also adversely affect our business, financial condition or results of operations in future periods.

Item 2. Unregistered Sales of Equity Securities and Use of Proceeds

The following table presents repurchases of our equity securities we made during the fiscal quarter ended December 28, 2019:

	Total Number of Shares Purchased	Average Price Paid per Share	Total Number of Shares Purchased As Part of Publicly Announced Plans or Programs	Maximum Number of Shares that May Yet be Purchased As Part of Publicly Announced Plans or Programs
September 29, 2019 – November 2, 2019	—	\$ —	—	438
November 3, 2019 – November 30, 2019	—	\$ —	—	438
December 1, 2019 – December 28, 2019	—	\$ —	—	438

We purchase common stock from time to time to mitigate dilution related to new shares issued for employee compensation such as stock options, restricted stock units, performance restricted stock units and for employee stock purchase plan activity, as well as to return to shareholders capital not immediately required to fund ongoing operations.

Share Purchase Plan

Our Board of Directors approved, and on February 11, 2011 announced, a purchase authorization of 2,000 shares. Authority over pricing and timing under the authorization has been delegated to management. The share purchase authorization has no expiration date. We made no share purchases during the first quarter of fiscal year 2020. As of December 28, 2019, there were 438 shares available for purchase under the existing authorization.

Item 6. Exhibits

Exhibit Number	Description
10.1	Retirement Agreement, dated October 17, 2019, by and between the Company and William C. Becker, incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed October 21, 2019.
10.2	Amendment No. 4 to Credit Agreement, dated as of November 1, 2019, among MTS Systems Corporation, JP Morgan Chase Bank, N.A., as Administrative Agent and Swingline Lender, JP Morgan Chase Bank, N.A., U.S. Bank National Association and Wells Fargo Bank, National Association as Issuing Banks, and the Revolving Lenders party thereto, incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed November 7, 2019.
31.1	Certification of the Chief Executive Officer Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002 (filed herewith).
31.2	Certification of the Chief Financial Officer Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002 (filed herewith).
32.1	Certification of the Chief Executive Officer Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002 (furnished herewith).
32.2	Certification of the Chief Financial Officer Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002 (furnished herewith).
101.INS	XBRL Instance Document - the instance document does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document (filed herewith).
101.SCH	XBRL Taxonomy Extension Schema Document (filed herewith).
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document (filed herewith).
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document (filed herewith).
101.LAB	XBRL Taxonomy Extension Label Linkbase Document (filed herewith).
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document (filed herewith).
104	Cover Page Interactive Data File (embedded within the Inline XBRL document) (filed herewith).

SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned thereunto duly authorized.

MTS SYSTEMS CORPORATION

Date: February 3, 2020

/s/ JEFFREY A. GRAVES

Jeffrey A. Graves

President and Chief Executive Officer

(Principal Executive Officer)

Date: February 3, 2020

/s/ BRIAN T. ROSS

Brian T. Ross

Executive Vice President and Chief Financial Officer

(Principal Financial Officer and Principal Accounting Officer)

SARBANES-OXLEY SECTION 302 CERTIFICATION

I, Jeffrey A. Graves, certify that:

1. I have reviewed this quarterly report on Form 10-Q of MTS Systems Corporation;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
 - (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, 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;
 - (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
 - (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
 - (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: February 3, 2020

/s/ JEFFREY A. GRAVES

Jeffrey A. Graves

President and Chief Executive Officer

SARBANES-OXLEY SECTION 302 CERTIFICATION

I, Brian T. Ross, certify that:

1. I have reviewed this quarterly report on Form 10-Q of MTS Systems Corporation;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
 - (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, 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;
 - (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
 - (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
 - (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: February 3, 2020

/s/ BRIAN T. ROSS

Brian T. Ross

Executive Vice President and Chief Financial Officer

**MTS SYSTEMS CORPORATION
CERTIFICATION OF CHIEF EXECUTIVE OFFICER
PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002 (18 U.S.C. 1350)**

The undersigned, Jeffrey A. Graves, the Chief Executive Officer of MTS Systems Corporation (the "Company"), has executed this Certification in connection with the filing with the Securities and Exchange Commission of the Company's Quarterly Report on Form 10-Q for the fiscal quarter ended December 28, 2019 (the "Report").

The undersigned hereby certifies that:

1. The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and
2. The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: February 3, 2020

/s/ JEFFREY A. GRAVES

Jeffrey A. Graves

President and Chief Executive Officer

This certification accompanies the Report pursuant to Section 906 of the Sarbanes-Oxley Act of 2002 and shall not be deemed "filed" by the Company for purposes of Section 18 of the Securities and Exchange Act of 1934, as amended.

MTS SYSTEMS CORPORATION
CERTIFICATION OF CHIEF FINANCIAL OFFICER
PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002 (18 U.S.C. 1350)

The undersigned, Brian T. Ross, the Chief Financial Officer of MTS Systems Corporation (the "Company"), has executed this Certification in connection with the filing with the Securities and Exchange Commission of the Company's Quarterly Report on Form 10-Q for the fiscal quarter ended December 28, 2019 (the "Report").

The undersigned hereby certifies that:

1. The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and
2. The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: February 3, 2020

/s/ BRIAN T. ROSS

Brian T. Ross

Executive Vice President and Chief Financial Officer

This certification accompanies the Report pursuant to Section 906 of the Sarbanes-Oxley Act of 2002 and shall not be deemed "filed" by the Company for purposes of Section 18 of the Securities and Exchange Act of 1934, as amended.