

# INDUSTRIAL WIRELESS SENSOR NETWORKS



(c) ON World



Entire contents ©2018 by ON World. All rights reserved. The information contained herein has been obtained from sources believed to be reliable. ON World takes no responsibility for any inaccuracies, completeness or adequacy of such information. ON World shall have no liability for errors, omissions or inadequacies in the information contained herein or for interpretations thereof. The reader assumes sole responsibility for the selection of these materials to achieve its intended results. The opinions expressed herein are subject to change without notice.

No part of this report excerpt may be given, lent, resold, or disclosed to non-customers without permission. Reproduction or disclosure in whole or in part to other parties is permitted only with the written and express consent of ON World.

This document is a free report excerpt. A full version of the report may be purchased directly from our website for an immediate download. If you need an invoice, please call or email us at: [research@onworld.com](mailto:research@onworld.com)

**ON World Inc.**  
Emerald Plaza Center  
402 West Broadway  
Suite 400  
San Diego, California 92101  
<http://www.onworld.com>

Toll free (U.S.): 888.312.2619  
International: 858.259.2397



## Executive Summary

Industrial wireless sensor networks (WSN) continue to expand into new markets with multi-protocol devices, maturing standards and ubiquitous IoT cloud platforms. Unit shipments grew by 69% over the last two years due to a robust manufacturing sector and increased spending on oil and gas exploration and production.

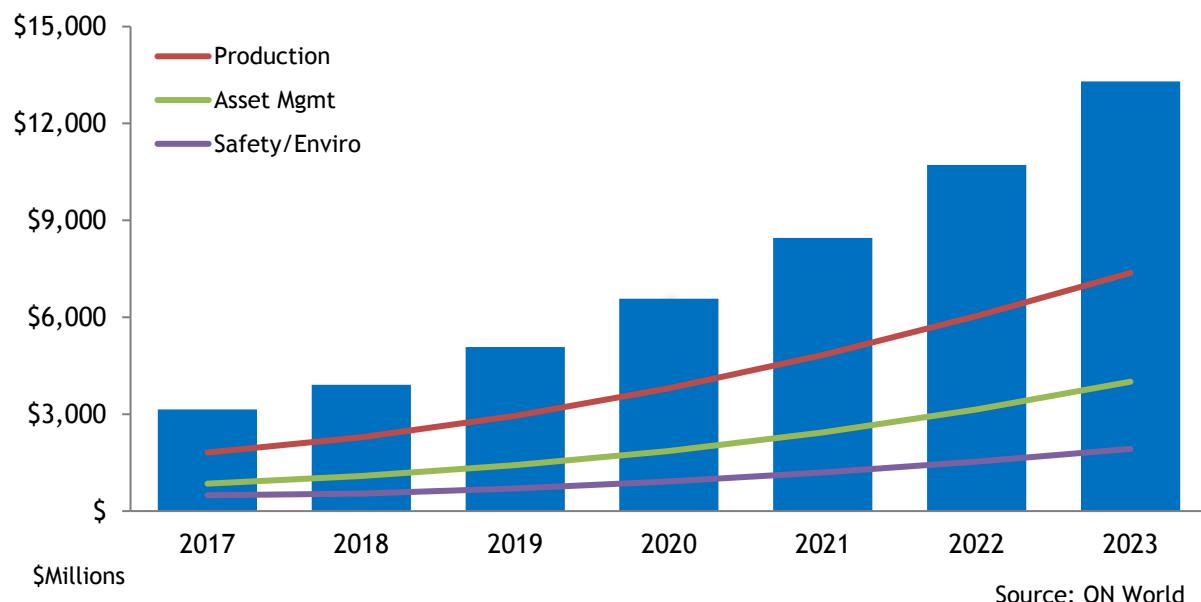
Based on an extensive 2018 survey completed by ON World with the International Society of Automation (ISA) and the LoRa Alliance™, there are three WSN technology areas that are driving industrial IoT growth today:

- Wireless mesh sensor networks
- Location based services
- Low power wide area networks

Applications for 802.15.4 and wireless mesh sensor networks continue to grow including equipment monitoring from offshore platforms, wireless gas detection, flood monitoring as well as solutions for agriculture, construction and factory automation. Location-based services is one of the fastest growing markets including low-cost proximity sensing with Bluetooth Low Energy, precision real-time location systems (RTLS) with ultra-wideband and a variety of remote monitoring and tracking of fixed and mobile assets using low power wide area networks (LPWAN).

In 2023, revenues for WSN equipment and associated services for industrial automation, agriculture and construction will surpass \$13 billion up from \$3 billion in 2017.

**Figure 1: Global Industrial WSN Revenues (2017-2023)**



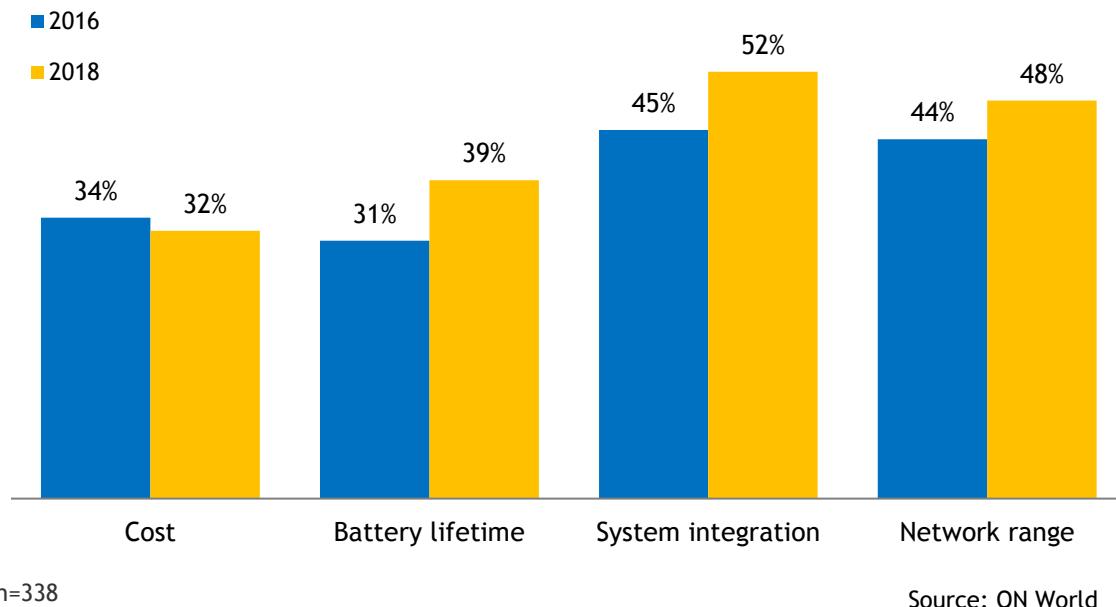
## Expanding the Industrial IoT Landscape

Adoption of wireless mesh sensor standards such as WirelessHART, ISA100 Wireless and Wi-SUN are expanding to markets such as wireless gas detection, worker safety and smart water networks. However, the fastest growth over the last two years has come from IT technologies such as WiFi, Bluetooth Low Energy and LPWAN. By targeting new IoT applications, these emerging industrial WSN technologies are expanding industrial IoT opportunities.

ON World's Q2 2018 survey with 160 industrial IoT professionals found that three-quarters believe that wireless sensor networking and IoT are important strategic investment areas. The fastest growing WSN applications are asset tracking, corrosion/structural monitoring, factory automation and machine health monitoring. Forty-eight percent (48%) more respondents are planning asset tracking compared with our previous survey in Q4 2016.

Users' satisfaction with WSN systems' battery lifetime, network range and system integration have had the most improvement over the last two years. Security, cost and complexity are rated the biggest WSN adoption inhibitors.

**Figure 2: Satisfaction with WSN Systems by Select Feature**





## Threats, Challenges & Opportunities

Low power wide area network (LPWAN) technologies such as LoRaWAN™, Sigfox and NB-IoT are disrupting industrial IoT markets with cloud connected, battery-powered wireless sensors and asset trackers that can communicate up to 30 kilometers. Disposable smart tags are the latest LPWA trend illustrated by Sigfox's 20 cent tracker module prototype and Semtech's disposable LoRa® Nanotag using an ultra-thin printed battery. By using Time Difference on Arrival (TDOA) in geolocation-ready gateways, LoRaWAN™ enables location applications without GPS.

The availability of LPWANs has resulted in accelerating IoT adoption by nearly all major Telecom/mobile/cable operators as well as numerous dedicated IoT network operators such as 1NCE, Ingenu, Senet, Sigfox and Thinxtra. This has drawn hundreds of IoT platform providers dedicated to accelerating industrial IoT markets including network infrastructure vendors such as Cisco, Ericsson, Kerlink, Nokia, Huawei, Sagemcom and ZTE.

Competition is intensifying for short range wireless sensor network components and devices. Multi-protocol devices mitigate the risk for end users while increasing the performance and functionality of WSN systems. For example, Honeywell's latest gateways and access points feature a single 802.15.4 radio that simultaneously communicate ISA100 Wireless and Wireless HART. Many vendors are combining short-range radios such as Bluetooth and WiFi with LPWAN technologies illustrated by the multi-radio micro tracker and geolocation solution by Abeeway (Actility).

This report is based on input from 200+ individuals including in-depth phone interviews with industrial WSN vendors, suppliers and service providers as well as a global survey completed in collaboration with the International Society of Automation (ISA) and the LoRa Alliance™.

For the past 15 years, ON World has conducted market research on industrial wireless sensing and IoT markets based on thousands of in-depth phone interviews across the whole industrial IoT value chain. In this report, we cover the global market for industrial wireless sensing, tracking and control in 12 market segments including 5-year market size forecasts, analysis of 100+ companies, an extensive technology review, the results of our recently completed survey on industrial wireless and IoT adoption trends, the fastest growing applications, technologies, needed innovations and satisfaction with current systems.

\*The LoRa® Mark is a trademark of Semtech Corporation or its subsidiaries.

\*LoRa Alliance™ and LoRaWAN™ are marks used under license from the LoRa Alliance.



## Methodology/Scope

This report analyzes and quantifies the global market opportunity for industrial wireless sensing, tracking and control. Our research methodology is based on extensive phone interviews and surveys with 200+ individuals, an in-depth technology evaluation, weighted market drivers and a competitive analysis of 100+ companies with industrial WSN systems, platforms and components. The major components of our research include the following:

### Data Collection/Investigation:

- Surveys/phone interviews with 200+ individuals representing industrial automation organizations worldwide.
- Secondary sources including third party reports, databases, financial reports, etc.

### Segmentation:

**Geographies:** North America, Western Europe, Asia Pacific, and Rest of World

---

**Markets/** Process (Oil & Gas; Refining/Petrochem/Chemicals; Electric Power; Primary

**Segments:** Metals, Minerals and Mining; Water/wastewater; Paper);

Hybrid & Discrete (Food & Beverage, Pharmaceuticals/Medical devices, Electronics/Semiconductor, Automotive/Transportation, Machinery and Electrical; Other discrete);

Other (Agriculture, Construction and Others)

---

**Solutions:** Process & Production; Asset management: Equipment health monitoring, Corrosion monitoring, Asset tracking/locating, tank monitoring and others; Health, safety and environmental monitoring

---

**Product segments:** WSN equipment (End nodes, repeaters, gateways and associated software) and services (installation, maintenance and hosted/Web services); Chipsets/modules

---

### Competitive Forces & Technology Dynamics:

- Product segmentation, value chain and business model analysis
- Distribution channels, product availability and vendor strength
- Standards developments, technology adoption and emerging technologies
- Analysis of products' performance, pricing, functionality and potential for disruption

### Market Size Forecasts:

- **Primary Research:** Recent market data is collected from vendors and end users on unit sales, growth trends, applications, hardware/service pricing, distribution channels, etc.
- **Market drivers:** Analysis of the weighted driver impact for each solution/market.
- **Projections:** Using all the above, we create 6-year data models from a conservative, moderate and aggressive viewpoint. Breakdowns are provided by target market, application, new vs displaced application, sensor type, geography, technology and product segment. Revenues are for equipment and associated software/services.
- **Verification:** Forecasts are benchmarked with secondary sources and verified/confirmed with vendors/industry experts whenever possible.



## Table of Contents

Executive Summary .....	1
Expanding the Industrial IoT Landscape .....	2
Threats, Challenges & Opportunities .....	3
Methodology/Scope .....	4
The Industrial WSN Ecosystem .....	5
The Market Opportunity .....	5
The Value System.....	6
Wireless Sensor Network Landscapes .....	7
Short Range Wireless .....	7
Wireless Mesh Sensor Networks .....	7
Long Range Wireless Sensor Networks .....	9
Low Power Wide Area Networks .....	9
IoT Cloud Platforms .....	11
Market Segmentation .....	12
Total Potential Market Sizing.....	13
WSN Solutions & Applications .....	14
Production .....	15
Asset Management .....	16
Machine Health Condition Based Monitoring .....	16
Corrosion & Structural Integrity Monitoring.....	17
Asset Tracking & Locating .....	18
Long Range Mobile Asset Tracking .....	18
Real-Time Location Systems .....	18
Health, Safety & Environmental Monitoring .....	19
Emissions Monitoring .....	19
Gas Detection.....	20
Perimeter Security & Intrusion Detection .....	21
Smart Water Networks .....	21
Survey Results.....	22
Respondent Overview.....	22
General WSN Trends .....	24
Adoption Stage .....	24
Growing Deployments, Expanding Network Sizes .....	25
Fastest Growing Applications .....	26
WSN Protocols Used .....	27
Wireless Standards & Mesh Adoption .....	28
Most Important Features .....	29
Satisfaction with Current WSN Systems.....	30
Future WSN Applications .....	31



Adoption Inhibitors .....	32
Innovation Areas .....	33
Strategic Investments .....	34
Equipment Costs .....	35
Low Power Wide Area Networks (LPWAN) .....	36
LPWAN Status .....	36
Product Development .....	36
LPWAN Applications .....	37
LPWAN Impact .....	38
Future Projections .....	39
LPWAN Challenges .....	40
Comments .....	40
IoT Cloud Platforms .....	42
IoT Platforms Used .....	42
IoT Benefits .....	42
Data Analytics Experience .....	43
Planned IoT Platforms .....	43
Data Analytics Barriers .....	44
Surveyed Organizations .....	45
Technology Dynamics .....	47
Summary .....	47
IP Addressability .....	47
WSN Standards & Industry Alliances .....	49
Short Range WSN Technologies .....	49
IEEE 802.15.4 .....	49
IEEE 802.15.4e .....	50
IEEE 802.15.4e Time-slotted Channel Hopping (TSCH) .....	50
IEEE 802.15.4k (Low Energy Critical Infrastructure Networks) .....	50
IEEE 802.15.4g (Smart Utility Networks) .....	51
Wi-SUN Alliance .....	51
ZigBee .....	51
Dotdot .....	51
WiFi .....	51
Bluetooth Low Energy .....	52
Bluetooth 5 .....	52
Bluetooth Mesh .....	52
Industrial WSN Standards .....	53
WirelessHART .....	53
HART-IP .....	53
ISA100 .....	53



ISA100 Wireless.....	54
ISA100 Wireless Compliance Institute (WCI) .....	54
WirelessHART Convergence .....	55
WIA-PA .....	55
Profibus Wireless Sensor and Actuator Networks (WSAN) .....	56
Low Power Wide Area Networks .....	57
Cellular Based LPWAN Technologies .....	58
LTE-M .....	58
NB-IoT.....	58
Non-Cellular LPWA Technologies .....	59
Sigfox .....	59
LoRa Alliance .....	59
Weightless SIG .....	60
ETSI's Low Throughput Networks (LTN).....	60
Other LPWAN Technologies .....	61
RPMA (Ingenu) .....	61
Qowisio .....	61
Link Labs .....	61
LPWA Network Tests .....	62
Range .....	62
IP Smart Object Technologies.....	63
IETF Standards .....	63
OMA SpecWorks .....	63
Open Source WSN/IoT Initiatives .....	64
Global Total Market Size Forecasts .....	65
Methodology.....	65
Global WSN Device Shipments by Scenario .....	66
Global WSN Revenues by Scenario.....	67
Global Total Units by Landscape .....	68
Global Total Revenues by Landscape .....	69
Global Total Units by Solution Segment.....	70
Global Total Revenues by Solution Segment .....	71
Global Total Units by Solution .....	72
Global Total Equipment Revenues by Solution .....	73
Average Sale Prices .....	74
Global Total Units by Sensor Type .....	75
Global Total Units by Product Segment .....	76
Global Total Revenues by Product Segment .....	77
Global Total Revenues by Geography .....	78
Global Total Units by Technology .....	79
Global Total Units by Topology .....	80
Target Markets.....	81



Process Automation .....	81
Survey Key Findings .....	82
Market Size Forecasts.....	84
Units by Market .....	84
Revenues by Market .....	85
Units by Solution .....	86
Revenues by Solution.....	87
Revenues by Product Segment .....	88
Revenues by Geography .....	89
Units by Technology .....	90
Hybrid & Discrete Industries.....	91
Survey Key Findings .....	92
Market Size Forecasts.....	94
Units by Market .....	94
Revenues by Market .....	95
Units by Solution .....	96
Revenues by Solution.....	97
Revenues by Product Segment .....	98
Revenues by Geography .....	99
Units by Technology .....	100
Agriculture, Construction & Others .....	101
Survey Key Findings .....	102
Market Size Forecasts.....	104
Units by Market .....	104
Revenues by Market .....	105
Units by Solution .....	106
Revenues by Solution.....	107
Revenues by Product Segment .....	108
Revenues by Geography .....	109
Units by Technology .....	110
Competitive Landscape.....	111
Summary .....	111
Company Profiles .....	112
WSN Components .....	112
IoT Connectivity, Device Management & Network Infrastructure.....	116
Devices & Systems .....	119
Platforms & IoT Service Providers .....	123



## List of Figures

Figure 1: Global Industrial WSN Revenues (2017-2023).....	1
Figure 2: Satisfaction with WSN Systems by Select Feature .....	2
Figure 3: Global Installed Industrial WSN Devices by Landscape (2017-2023).....	5
Figure 4: Industrial Wireless Mesh Sensor Network Adoption.....	8
Figure 5: Select Wireless Mesh Protocols Used Over the Last 2 Years .....	9
Figure 6: Industrial Internet of Things .....	11
Figure 7: Total Potential Industrial IoT Points by Market .....	13
Figure 8: Industrial WSN Solution Segments & Applications .....	14
Figure 9: Process Monitoring & Control Growth Over the Last 2 Years .....	15
Figure 10: Select Wireless Condition Based Monitors .....	16
Figure 11: Industrial Corrosion Costs by Segment .....	17
Figure 12: Select Wireless Gas Detectors .....	20
Figure 13: Respondents by Industry Role.....	22
Figure 14: Respondents by Job Position .....	22
Figure 15: Respondents by Geographical Region .....	23
Figure 16: Respondents by Targeted Industry .....	23
Figure 17: WSN Adoption Stage .....	24
Figure 18: WSN Adoption Stage Over the Last 2 Years.....	24
Figure 19: Total WSN Devices Deployed (All Locations) .....	25
Figure 20: Largest WSN Deployment/Location .....	25
Figure 21: Current WSN Applications by Growth.....	26
Figure 22: Fastest Growing WSN Applications .....	26
Figure 23: WSN Protocols Used (All Respondents) .....	27
Figure 24: WSN Protocols Used Over the Last 2 Years .....	27
Figure 25: Wireless Mesh Field Devices Over the Last 2 Years .....	28
Figure 26: Preferred Standards Approach Over the Last 2 Years .....	28
Figure 27: Most Important WSN Features Rated .....	29
Figure 28: Most Important WSN Features Over the Last 2 Years .....	29
Figure 29: Satisfaction with WSN Systems .....	30
Figure 30: Satisfaction with WSN Systems Over the Last 2 Years.....	30
Figure 31: Planning Future/Additional WSN .....	31
Figure 32: Planned WSN Applications Over the Last 2 Years .....	31
Figure 33: WSN Inhibitors Rated .....	32
Figure 34: Biggest WSN Inhibitors Over the Last 2 Years .....	32
Figure 35: Important Innovations Rated.....	33
Figure 36: Most Important Innovations Over the Last 2 Years .....	33
Figure 37: Strategic Investments Rated .....	34
Figure 38: Most Important Strategic Investments Over the Last 2 Years .....	34



Figure 39: Average Cost per WSN End Node Over the Last 2 Years.....	35
Figure 40: LPWAN Adoption Status .....	36
Figure 41: LPWAN Product Timeline .....	36
Figure 42: Most Likely LPWAN Applications.....	37
Figure 43: Wireless Sensing/M2M Applications Requiring >1K Bytes/Day .....	37
Figure 44: LPWAN's Impact .....	38
Figure 45: Most Likely LPWAN Technologies in 2028 .....	38
Figure 46: LPWAN IoT Penetration Rate by 2028 .....	39
Figure 47: Most Likely LPWAN Technologies by 2028 .....	39
Figure 48: LPWAN Challenges .....	40
Figure 49: IoT Platforms Used.....	42
Figure 50: IoT Benefits .....	42
Figure 51: Data Analytics Experience Rated.....	43
Figure 52: Planned IoT Platforms.....	43
Figure 53: Data Analytics Barriers .....	44
Figure 54: Data Analytics Barriers Rated .....	44
Figure 55: WSAN Devices in a Production Cell .....	56
Figure 56: LPWAN Technologies - Range in Meters .....	62
Figure 57: LPWAN Technologies - 5000 Node Percent Complete vs Power Used .....	62
Figure 58: Global Industrial WSN Unit Shipments by Scenario (2017-2023) .....	66
Figure 59: Global Industrial WSN Revenues by Scenario (2017-2023) .....	67
Figure 60: Global Industrial WSN Unit Shipments by Landscape (2017-2023).....	68
Figure 61: Global Industrial WSN Revenues by Landscape (2017-2023).....	69
Figure 62: Global Industrial WSN Units by Solution Segment (2017-2023) .....	70
Figure 63: Global Industrial WSN Revenues by Solution Segment (2017-2023) .....	71
Figure 64: Global Industrial WSN Units by Solution (2017-2023).....	72
Figure 65: Global Industrial WSN Eqpmnt Revenues by Solution (2017-2023) .....	73
Figure 66: Global Industrial WSN Node ASPs per Solution (2017-2023) .....	74
Figure 67: Global Industrial WSN Sensors by Type (2017-2023) .....	75
Figure 68: Global Industrial WSN Unit Shipments by Product Segment (2017-2023) .....	76
Figure 69: Global Industrial WSN Revenues by Product Segment (2017-2023) .....	77
Figure 70: Global Industrial WSN Revenues by Geography (2017-2023) .....	78
Figure 71: Global Industrial WSN Chipsets by Technology (2017-2023).....	79
Figure 72: Global Industrial WSN Chipsets by Topology (2017-2023).....	80
Figure 73: Global Process Automation Installed WSN Units & Others (2017-2023) .....	81
Figure 74: Process - Largest WSN Deployment .....	82
Figure 75: Process - Fastest Growing WSN Applications .....	82
Figure 76: Process - WSN Protocols Used.....	83
Figure 77: Process - Most Important WSN Features .....	83
Figure 78: Process - WSN Units by Market (2017-2023).....	84



Figure 79: Process - WSN Revenues by Market (2017-2023).....	85
Figure 80: Process - WSN Units by Solution (2017-2023) .....	86
Figure 81: Process - WSN Eqpmnt Revenues by Solution (2017-2023).....	87
Figure 82: Process - WSN Revenues by Product Segment (2017-2023).....	88
Figure 83: Process - WSN Revenues by Geography (2017-2023).....	89
Figure 84: Process - WSN Chipsets by Technology (2017-2023) .....	90
Figure 85: Hybrid/Discrete Automation Installed WSN Units & Others (2017-2023).....	91
Figure 86: Hybrid/Discrete - Largest WSN Deployment.....	92
Figure 87: Hybrid/Discrete - Fastest Growing WSN Applications .....	92
Figure 88: Hybrid/Discrete - WSN Protocols Used .....	93
Figure 89: Hybrid/Discrete - Most Important WSN Features .....	93
Figure 90: Hybrid/Discrete - WSN Units by Market (2017-2023) .....	94
Figure 91: Hybrid/Discrete - Revenues by Market (2017-2023) .....	95
Figure 92: Hybrid/Discrete - WSN Units by Solution (2017-2023).....	96
Figure 93: Hybrid/Discrete - Eqpmnt WSN Revenues by Solution (2017-2023) .....	97
Figure 94: Hybrid/Discrete - WSN Revenues by Product Segment (2017-2023) .....	98
Figure 95: Hybrid/Discrete - WSN Revenues by Geography (2017-2023) .....	99
Figure 96: Hybrid/Discrete - WSN Chipsets by Technology (2017-2023).....	100
Figure 97: Global Agriculture/Others Installed WSN Units & Others (2017-2023) .....	101
Figure 98: Agriculture/Others - Largest WSN Deployment.....	102
Figure 99: Agriculture/Others - Fastest Growing WSN Applications.....	102
Figure 100: Agriculture/Others - WSN Protocols Used .....	103
Figure 101: Agriculture/Others - Most Important WSN Features.....	103
Figure 102: Agriculture/Others - WSN Units by Market (2017-2023) .....	104
Figure 103: Agriculture/Others - WSN Revenues by Market (2017-2023).....	105
Figure 104: Agriculture/Others - WSN Units by Solution (2017-2023).....	106
Figure 105: Agriculture/Others - Eqpmnt WSN Revenues by Solution (2017-2023) .....	107
Figure 106: Agriculture/Others - WSN Revenues by Product Segment (2017-2023) .....	108
Figure 107: Agriculture/Others - WSN Revenues by Geography (2017-2023) .....	109
Figure 108: Agriculture/Others - WSN Chipsets by Technology (2017-2023).....	110
Figure 109: The Industrial IoT/WSN Competitive Landscape .....	111



## List of Tables

Table 1: The Industrial IoT/WSN Value System .....	6
Table 2: Industrial WSN Market Segments & Adoption Drivers .....	12
Table 3: Industrial Wireless Sensor Network Standards .....	49
Table 4: LPWAN Technologies Summarized.....	57
Table 5: Open Source WSN/IoT Initiatives .....	64
Table 6: Global Industrial WSN Unit Shipments by Scenario (2017-2023) .....	66
Table 7: Global Industrial WSN Revenues by Scenario (2017-2023) .....	67
Table 8: Global Industrial WSN Unit Shipments by Landscape (2017-2023). ....	68
Table 9: Global Industrial WSN Revenues by Landscape (2017-2023) .....	69
Table 10: Global Industrial WSN Units by Solution Segment (2017-2023) .....	70
Table 11: Global Industrial WSN Revenues by Solution Segment (2017-2023).....	71
Table 12: Global Industrial WSN Units by Solution (2017-2023).....	72
Table 13: Global Industrial WSN Eqpmnt Revenues by Solution (2017-2023) .....	73
Table 14: Global Industrial WSN Node ASPs per Solution (2017-2023) .....	74
Table 15: Global Industrial WSN Sensors by Type (2017-2023).....	75
Table 16: Global Industrial WSN Unit Shipments by Product Segment (2017-2023) .....	76
Table 17: Global Industrial WSN Revenues by Product Segment (2017-2023) .....	77
Table 18: Global Industrial WSN Revenues by Geography (2017-2023) .....	78
Table 19: Global Industrial WSN Chipsets by Technology (2017-2023).....	79
Table 20: Global Industrial WSN Chipsets by Topology (2017-2023) .....	80
Table 21: Process - WSN Units by Market (2017-2023).....	84
Table 22: Process - WSN Revenues by Market (2017-2023) .....	85
Table 23: Process - WSN Units by Solution (2017-2023) .....	86
Table 24: Process - WSN Eqpmnt Revenues by Solution (2017-2023) .....	87
Table 25: Process - WSN Revenues by Product Segment (2017-2023).....	88
Table 26: Process - WSN Revenues by Geography (2017-2023).....	89
Table 27: Process - WSN Chipsets by Technology (2017-2023) .....	90
Table 28: Hybrid/Discrete - WSN Units by Market (2017-2023) .....	94
Table 29: Hybrid/Discrete - Revenues by Market (2017-2023) .....	95
Table 30: Hybrid/Discrete - WSN Units by Solution (2017-2023).....	96
Table 31: Hybrid/Discrete - Eqpmnt WSN Revenues by Solution (2017-2023) .....	97
Table 32: Hybrid/Discrete - WSN Revenues by Product Segment (2017-2023) .....	98
Table 33: Hybrid/Discrete - WSN Revenues by Geography (2017-2023) .....	99
Table 34: Hybrid/Discrete - WSN Chipsets by Technology (2017-2023) .....	100
Table 35: Agriculture/Others - WSN Units by Market (2017-2023) .....	104
Table 36: Agriculture/Others - WSN Revenues by Market (2017-2023) .....	105
Table 37: Agriculture/Others - WSN Units by Solution (2017-2023) .....	106
Table 38: Agriculture/Others - Eqpmt WSN Revenues by Solution (2017-2023).....	107



Table 39: Agriculture/Others - WSN Revenues by Product Segment (2017-2023) .....	108
Table 40: Agriculture/Others - WSN Revenues by Geography (2017-2023) .....	109
Table 41: Agriculture/Others - WSN Chipsets by Technology (2017-2023).....	110
Table 42: WSN Components - Profiles .....	112
Table 43: IoT Software - Profiles .....	116
Table 44: Industrial WSN Systems - Profiles .....	119
Table 45: IT/Automation Platform - Profiles .....	123



**ON World Inc.**  
Emerald Plaza Center  
402 West Broadway  
Suite 400  
San Diego, California 92101  
<http://www.onworld.com>

Toll free phone (U.S.): 888.312.2619  
International callers: 858.259.2397

ON World provides global business intelligence on Internet of Things markets. Since 2003, our market research has been used by Fortune 1000 companies, investors and IoT developers worldwide.

If you have any questions on the report, please call us or send us an email at: [research@onworld.com](mailto:research@onworld.com)