Unlocking Enterprise Use Cases with Gen2X

RFID Forum 2025

Gagan Luthra
VP of Systems Product Management, Impinj

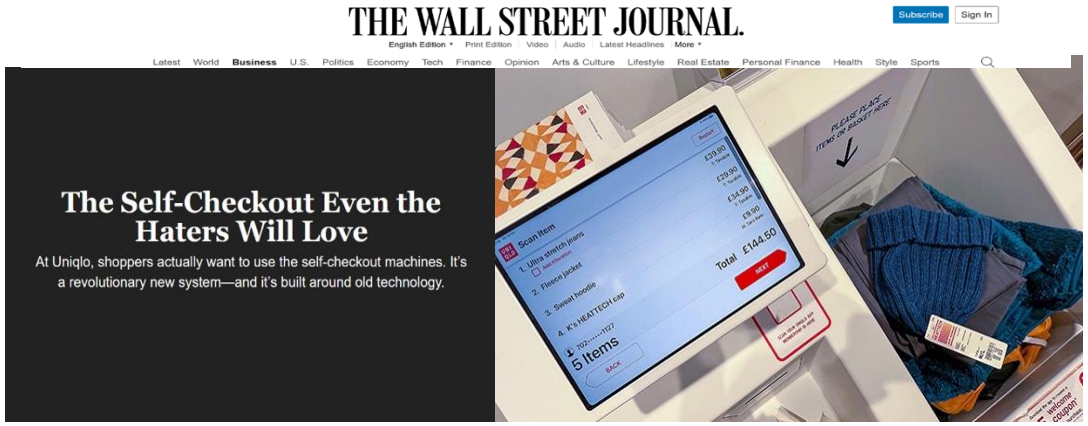
Item Connectivity is a Corporate Imperative



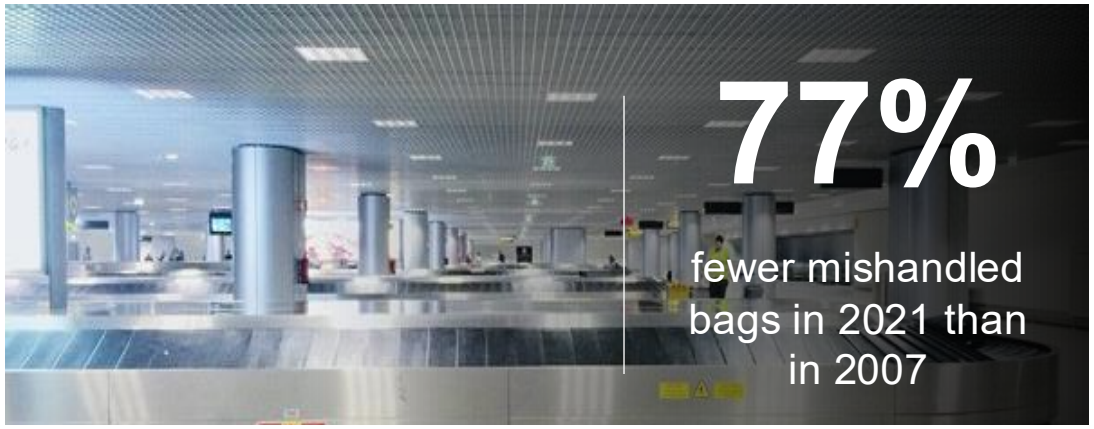
Inventory visibility and omnichannel fulfillment



Supply chain automation



Retail self-check & loss prevention



Asset Management & Tracking

IMPINJ

RAIN RFID: An Amazing Item Connectivity Technology

RAIN = RAdio IdentificatioN

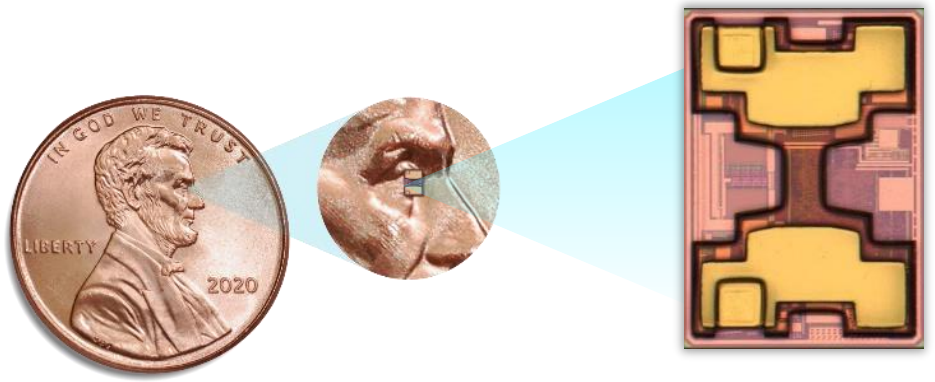
Unique ID for pennies per tag

Long range @ 10m without line-of-sight

Fast scanning of up to 1,000 items/sec

Battery-free with essentially unlimited life

Worldwide standard, spectrum, and ecosystem



Impinj M830
radio on chip
250µm × 360µm

Antenna in
thread



Complementary IoT Technologies

Items | Beacons | Internet | Payment | Vision

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With Proven ROI

- Improving operational efficiencies and profit
- Increasing revenue with data-driven selling
- Empowering frontline workers and workflows
- Delivering delightful consumer experiences
- Protecting brands and product safety



Representative RAIN RFID Deployments

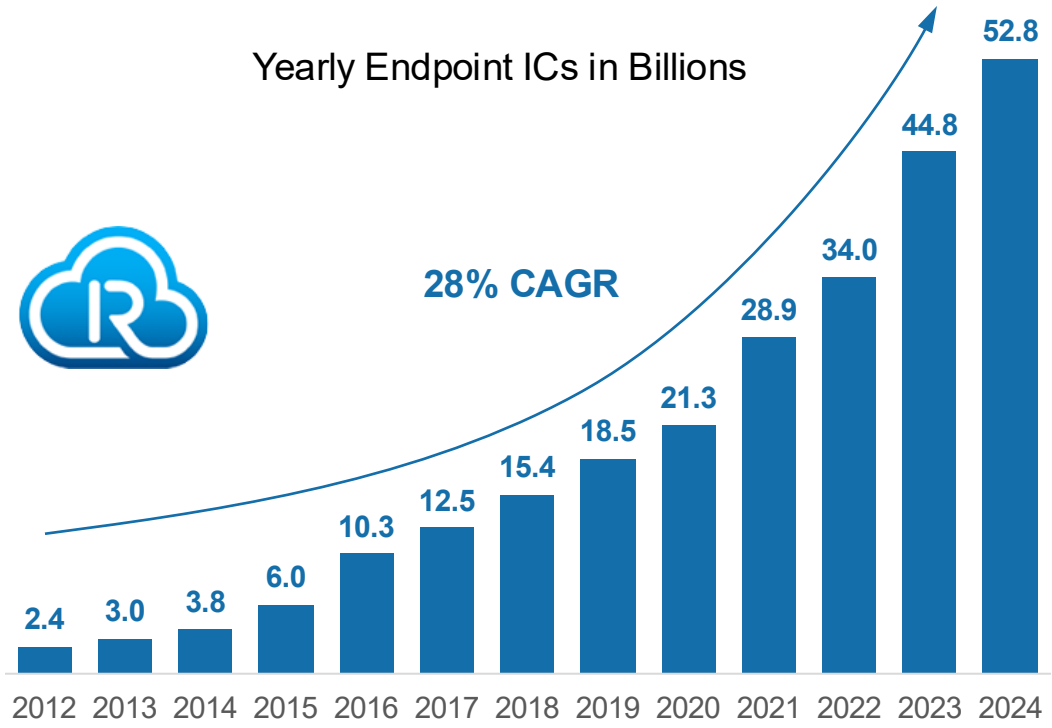
INDITEX, Audi, BOEING, 中国邮政 CHINA POST, cisco, Coca-Cola, COSTCO WHOLESALE, DECATHLON, DELTA, FAST RETAILING, H&M, AIRFRANCE, Kroger, LUXOTTICA, MICHELIN, NIKE, NORDSTROM, RALPH LAUREN, TARGET, TRADER JOE'S, ups, VOLVO, Walmart

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We Have An Unprecedented Opportunity

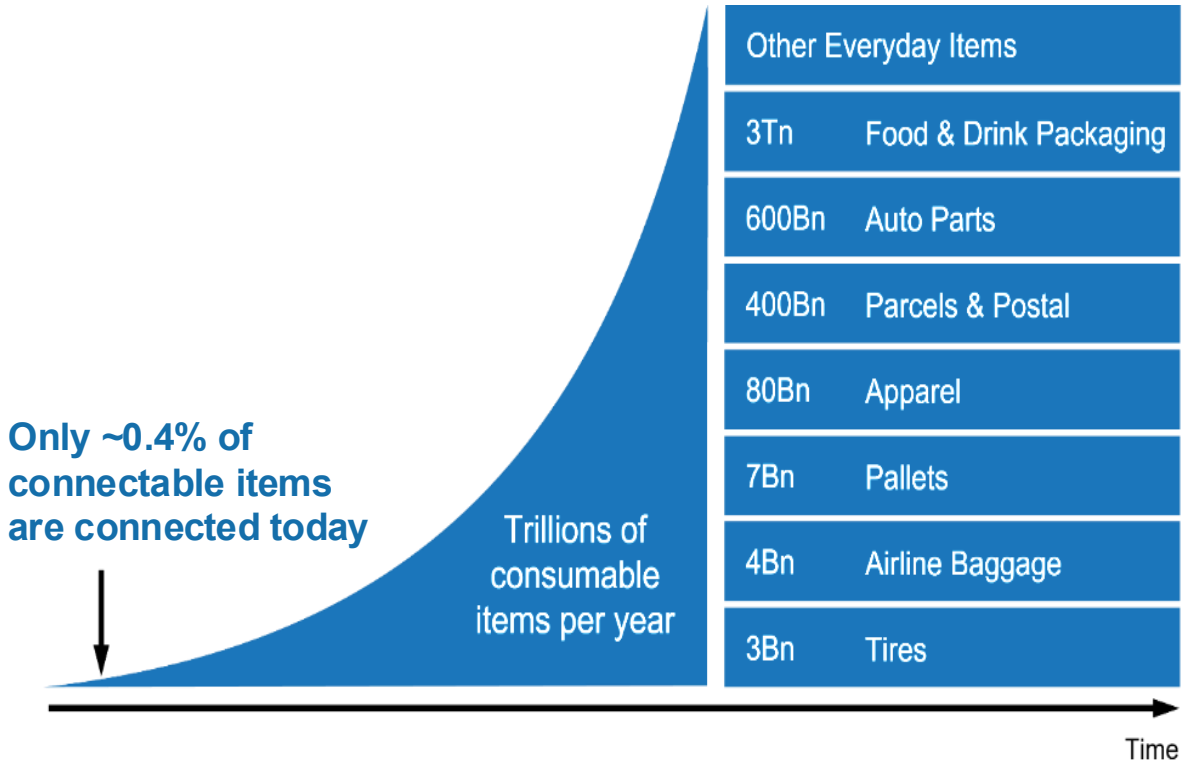
Today

Connecting 1B+ items per week



Future Opportunity

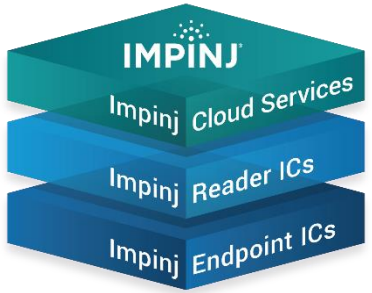
Connecting trillions of items every year



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Rising to Meet the Trillion+ Unit Opportunity

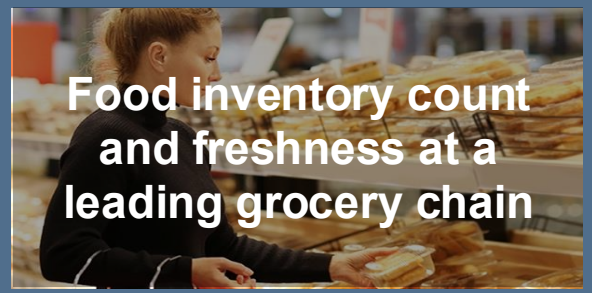
Two decades of helping Fortune 500 enterprise solve operational challenges



ENTERPRISE EXAMPLES







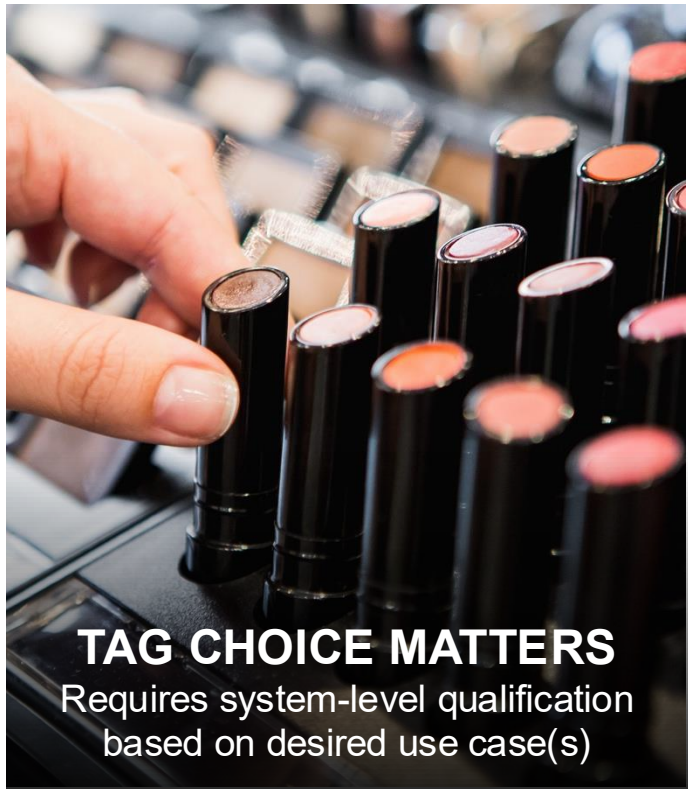
IMPINJ PLATFORM SOLUTION TOOLBOX

- Reduced loss prevention stray reads, allowing self-checkout
- Addressed consumer privacy at point-of-sale
- Inhibited item counterfeiting and fraudulent returns
- Improved readability of small, embedded tags
- Decluttered conveyor-to-truck shipment loading
- Boosted dock-door reading and directional accuracy
- Reduced costly misloads and misshipments
- Reduced retail-inventory counting time, saving labor cost
- Improved readability of tags on hard-to-read items

Performance Matters

Exceptional Readability

Small, embedded tags in large tag populations, on densely packed items, on traditionally hard-to-read items



TAG CHOICE MATTERS

Requires system-level qualification based on desired use case(s)

Reliable Auto Reading

Right tag, right place, right time – expand beyond inventory counting to autonomous item sensing

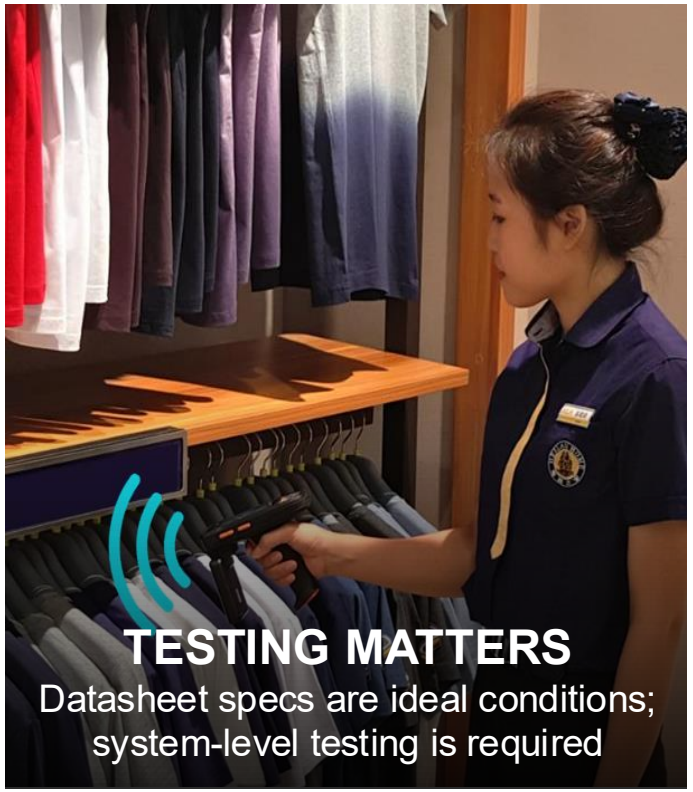


READ SPEED MATTERS

Algorithms require multiple reads of moving tags in cluttered environments

Real-World Repeatability

Exceptional readability at speed ensures reliable, repeatable performance and future-proofs enterprise solutions



TESTING MATTERS

Datasheet specs are ideal conditions; system-level testing is required

IMPINJ

GEN2X™ Performance

An enhancement to the radio and logical layers of the RAIN radio standard improves RAIN solution performance, while reducing solution cost



Gen2X delivers exceptional readability

- Improves tag sensitivity by up to 2 dB
- Improves reader sensitivity by up to 6 dB
- Built upon Impinj market-leading Gen2 performance

Gen2X delivers faster inventory

- Maintains read accuracy at faster read modes
- Optimizes tag-to-reader data and interactions
- Reduces tag communications errors

Gen2X declutters complex tag environments

- Silences already-inventoried tag sub-populations
- Optimizes tag selection to focus on tags-of-interest
- Reduces cross-reads in multi-reader environments

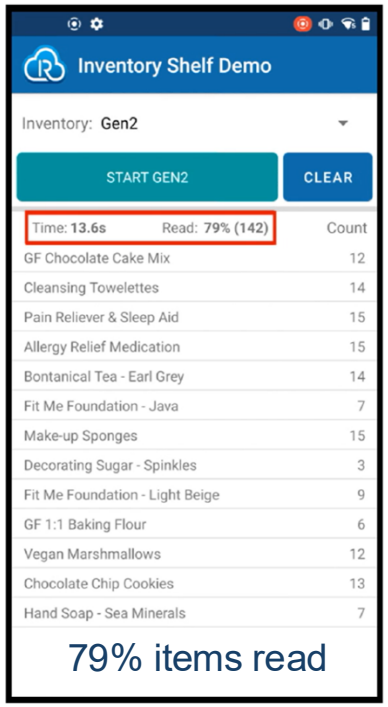
Available to entire industry and interoperable with RAIN RFID standard

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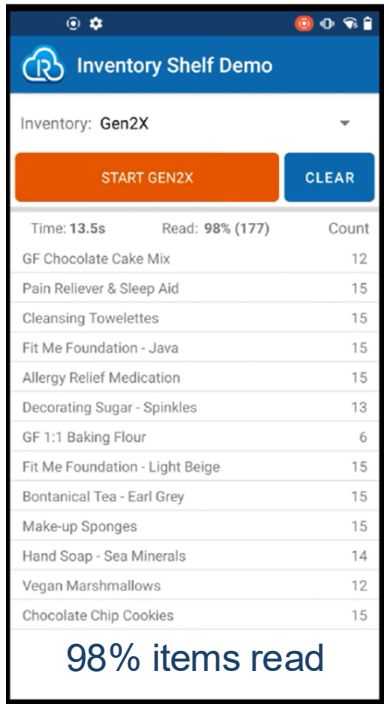
Handheld Inventory of Small, Hard-to-Read Items

Improving inventory visibility in retail general merchandise and grocery

Gen2



GEN2X™ Readability





19% accuracy improvement

Performance is based on Impinj lab testing with M830 inlays – actual results may vary

IMPINJ

Real-Time Overhead Inventory and Location Systems

Improves coverage and location accuracy, and/or reduces cost per square meter

	Gen2	GEN2X™ Readability	GEN2X™ Fast Inventory
Area Coverage	Baseline	+39%	+6%
Read Rate	48 tags/s Baseline	63 tags/s +31%	324 tags/s +575%



Performance is based on Impinj lab testing with 28mmx16mm M830 inlays – actual results may vary

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Loss Prevention and Loss Analytics Systems

Improve accuracy and reduce solution cost

System Detection Accuracy

	Gen2	GEN2X™ Fast Inventory
9 Reader Configuration	80.2%	92.9%
6 Reader Configuration	63.5%	89.8%



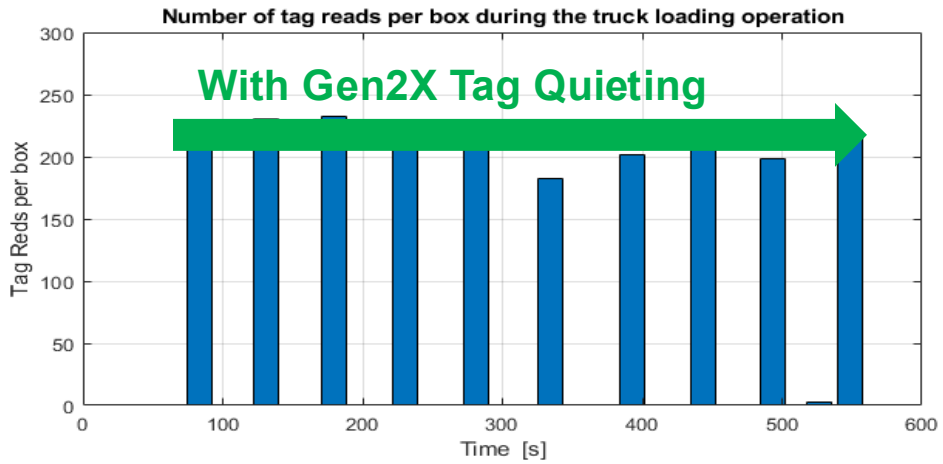
Performance is based on Impinj lab testing with M830 inlays – actual results may vary
Tags were purposely detuned to bring Gen2 performance for Trapezoid configuration to ~50%
Detuning of tags is representative of smaller, more embedded inlays that are detuned

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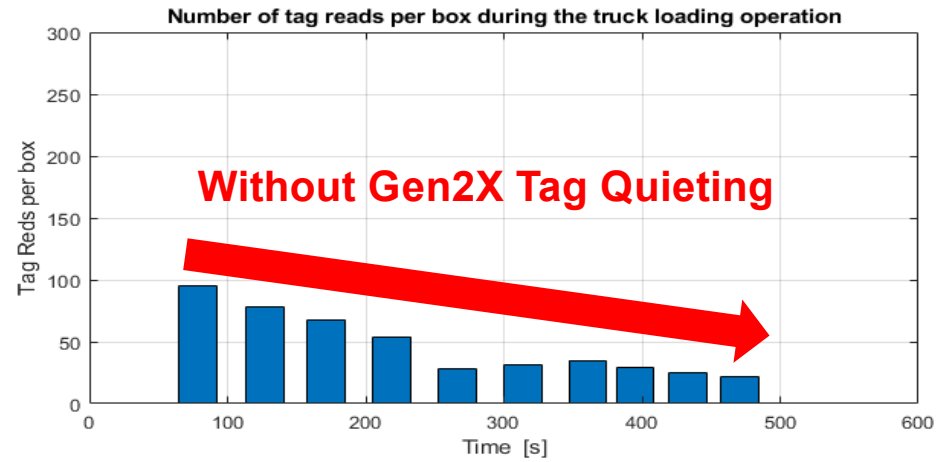
Conveyor-to-Truck Shipment Loading

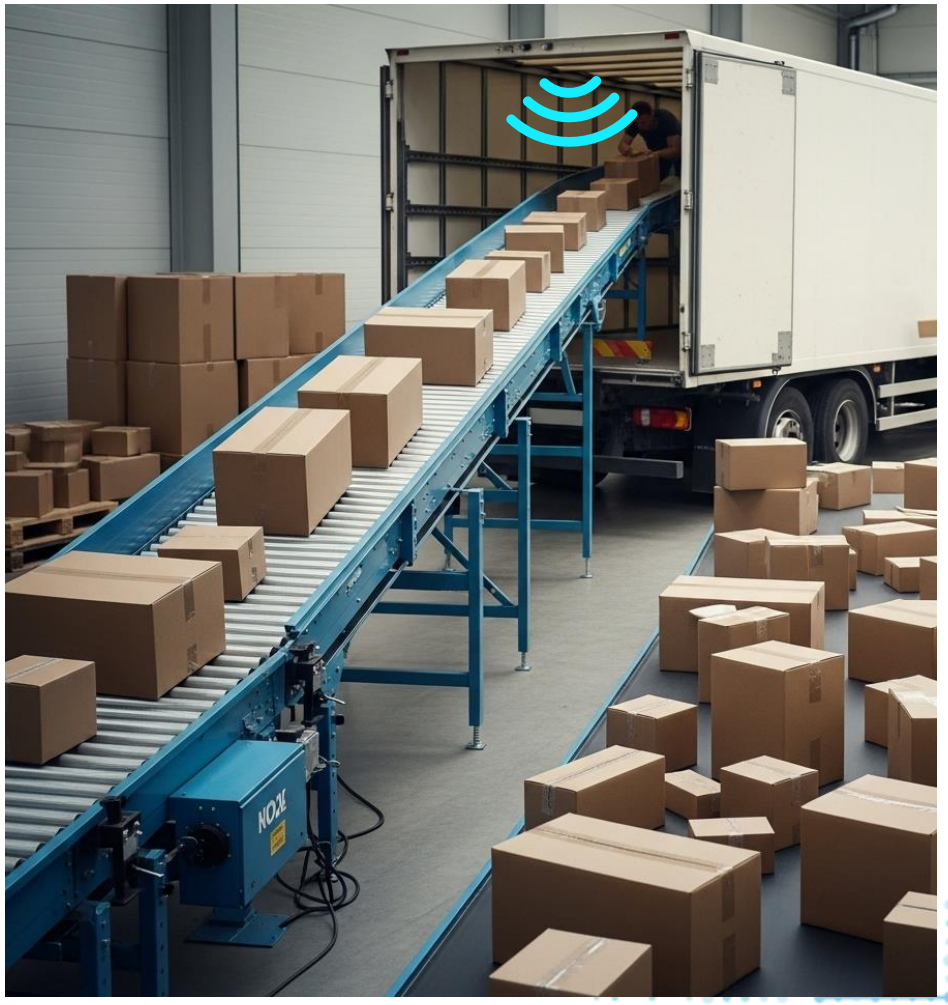
Declutter challenging tag environment to improve misload detection

GEN2X™ Declutter



Gen2





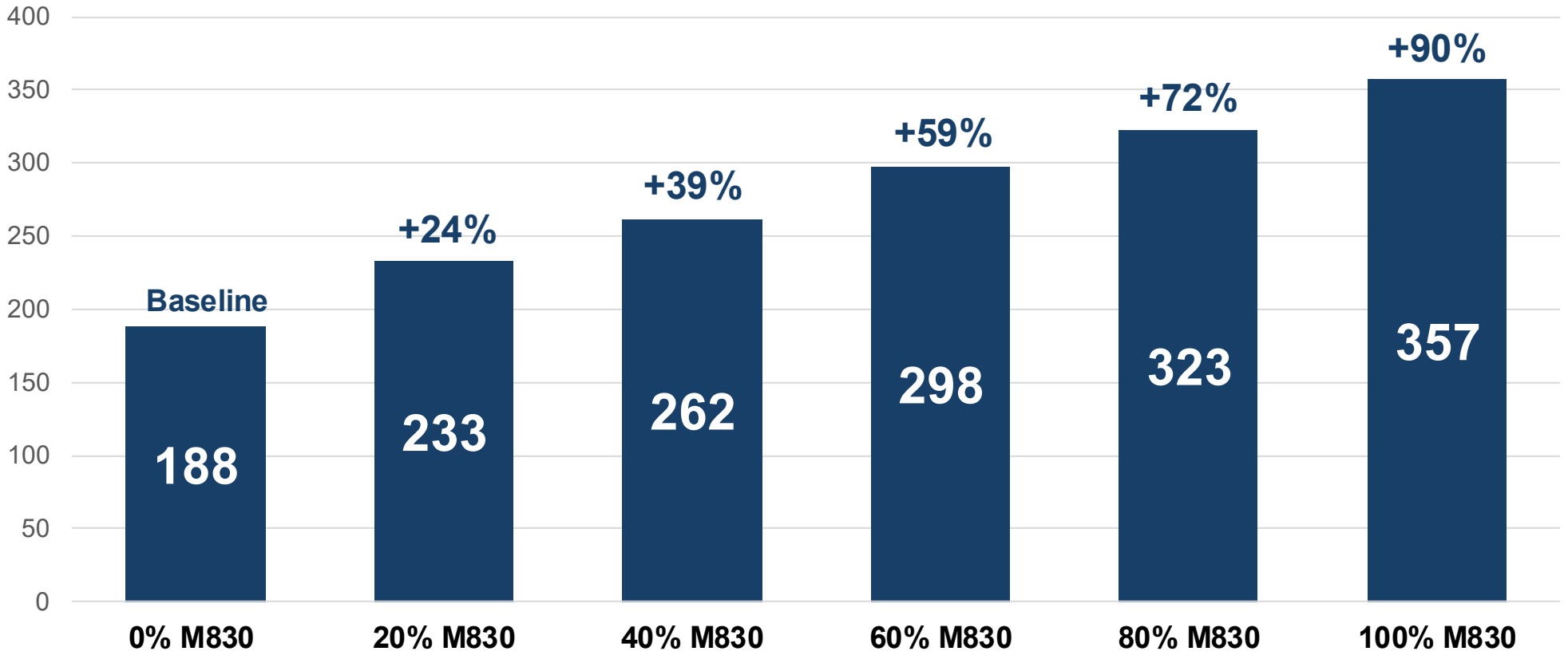
Performance is based on Impinj lab testing with M830 inlays – actual results may vary

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Gen2X Consistently Improves System Performance

Regardless of tag population due to seamless interoperability with Gen2

4m range testing of 500 tag population of hard-to-read tags after 20 second duration



GEN2X™ Readability

Performance is based on Impinj lab testing – actual results may vary

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Gen2X is Widely Available in Production



85+

Production Gen2X-enabled partner inlays and tags



50+

Production Gen2X-enabled readers and reader modules

ZEBRA

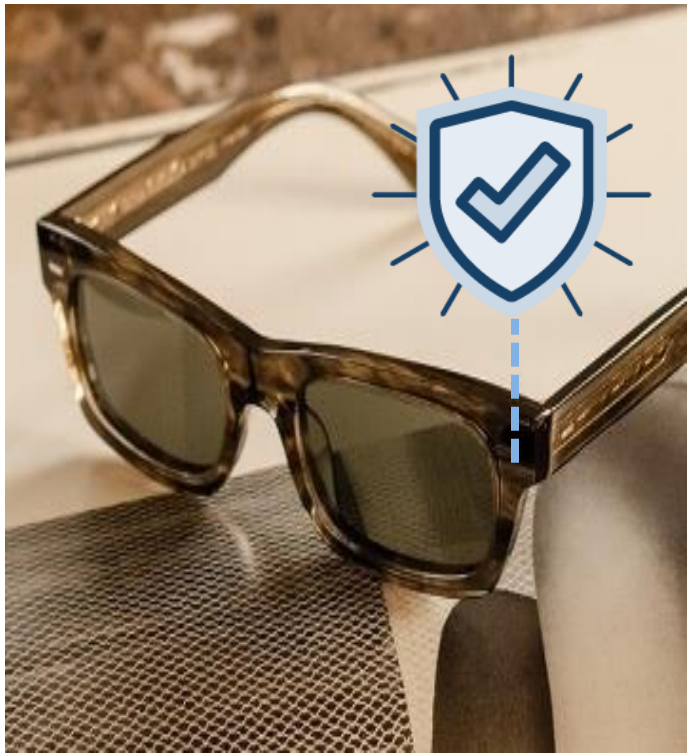
"Zebra, as a Gen2X licensee, plans to leverage Gen2X in our products and solutions. We look forward to the benefits Gen2X will have enhancing item visibility and creating operational success for our customers."

Joe White, Chief Product and Solutions Officer at Zebra Technologies

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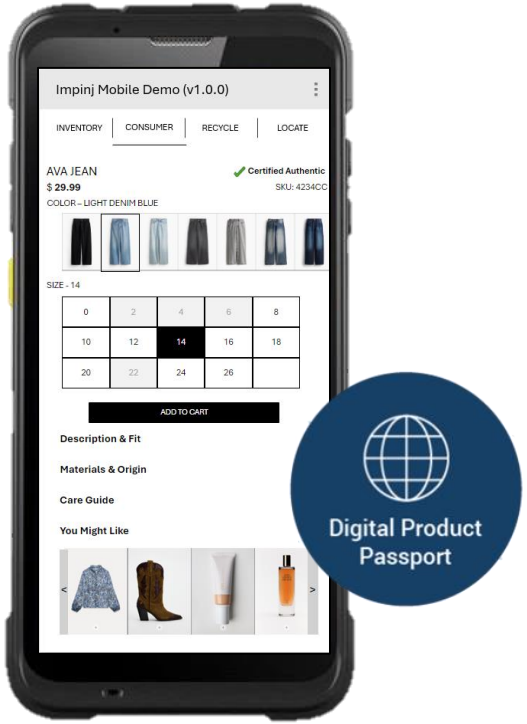
Gen2X Roadmap: Innovating Tomorrow's Solutions, Today

GEN2X™
Protection



Emerging Today
Protecting consumer privacy and inhibiting counterfeit items/labels

GEN2X™
Consumer



Future Innovation
Impinj RAIN Mobile Consumer Self-Checkout Demo

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Join us in wirelessly connecting trillions of items every year

Thank you.











Thank You



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