Using Hybrid RFID for Improved Asset Tracking

PROMAT 2015

McCormick Place South | Chicago
March 23-26, 2015
promatshow.com

Sponsored by:

Barcoding INCORPORATED

4263

Presented by:

Tom O'Boyle

Director of RFID, Barcoding, Inc.

powered by MHI

FIND WHAT'S NEXT.

PROMAT 2015
McCormick Place South | Chicago
March 23-26, 2015
promatshow.com
powered by MHI

WHY RFID?
RFID Technology is Efficient – Accurate – Connected (when implemented correctly)

- Eliminates user-initiated activities

- Removes line of sight requirements

- Provides 100% accuracy

- Connects workflows and processes

- *More cost-effective and sophisticated than ever before*

The RFID market is expected to increase to over $32B in 2015

"By 2021, it is estimated that the number of RFID tags will have risen to 209 billion as the Internet of Things takes off."

FIND WHAT'S NEXT.

PRO**MAT** 2015
McCormick Place South | Chicago
March 23-26, 2015
promatshow.com
powered by ☆ MHI

Think Process First, Technology Second

What are your asset tracking goals?

- Reduce Operational Costs
- Improve Your Customers Service and Experience
- Generate More Cash

FIND WHAT'S NEXT.

PROMAT 2015
McCormick Place South | Chicago
March 23-26, 2015
promatshow.com
powered by MHI

RFID Technology Consolidation

Select the most appropriate technology for overall requirements

- Active RFID – for people tracking applications, high value assets or true RTLS data is required

- Passive RFID – when cost or asset type limitations exist and chokepoint/gateway detection is sufficient for the application use case

Hybrid Approach – Combines ACTIVE & PASSIVE

MHI
THE INDUSTRY THAT MAKES SUPPLY CHAINS WORK™

FIND WHAT'S NEXT.

PROMAT 2015
McCormick Place South | Chicago
March 23-26, 2015
promatshow.com
powered by MHI
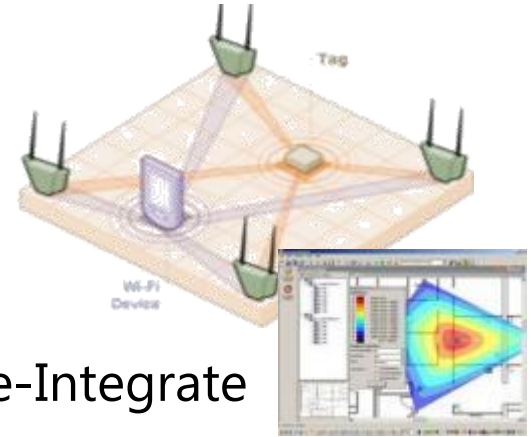
Active RFID Technology

Integration to ERP, Inventory Mgt. Systems, WMS and other 3rd Party Applications

Visibility Software

Track-Alert-Manage-Integrate

Infrastructure

Wi-Fi Infrastructure and Location Engine
(Wireless AP's)

Asset and worker Safety tags

Intel LBS Devices

Wi-Fi + GPS

Wi-Fi + Temp and Humidity Sensors

Tags

MHI
THE INDUSTRY THAT MAKES SUPPLY CHAINS WORK™

FIND WHAT'S NEXT.

PROMAT 2015
McCormick Place South | Chicago
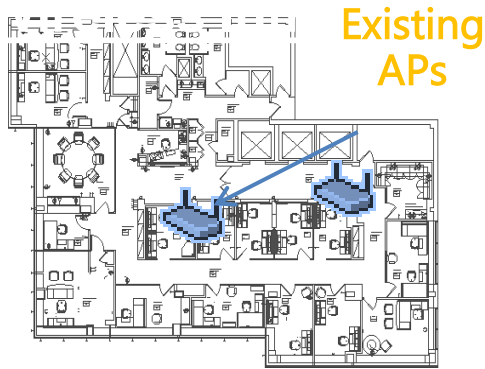March 23-26, 2015
promatshow.com
powered by MHI

Active Tags Location

- Highly variable movement
- Site wide location flexibility
- Real-Time location demands

FIND WHAT'S NEXT.

PROMAT 2015
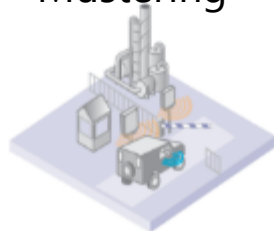McCormick Place South | Chicago
March 23-26, 2015
promatshow.com
powered by MHI

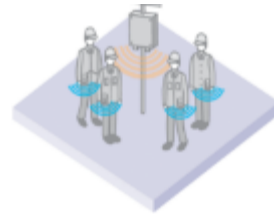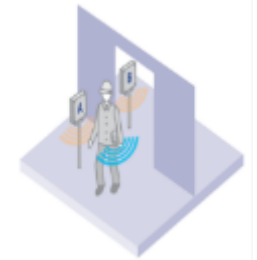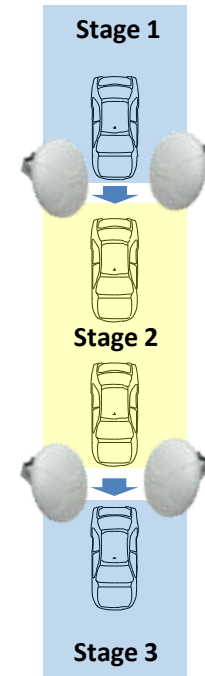# Typical RTLS Infrastructure

Existing APs

Wireless Set Up for RTLS

Additional APs

RTLS Wireless Infrastructure

- APs along perimeter
- Minimum of 3, 4 or more preferred (triangulation)
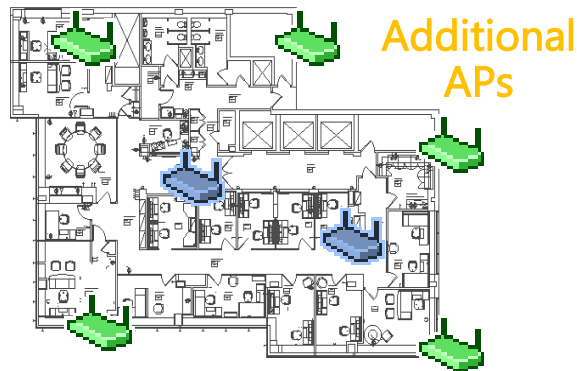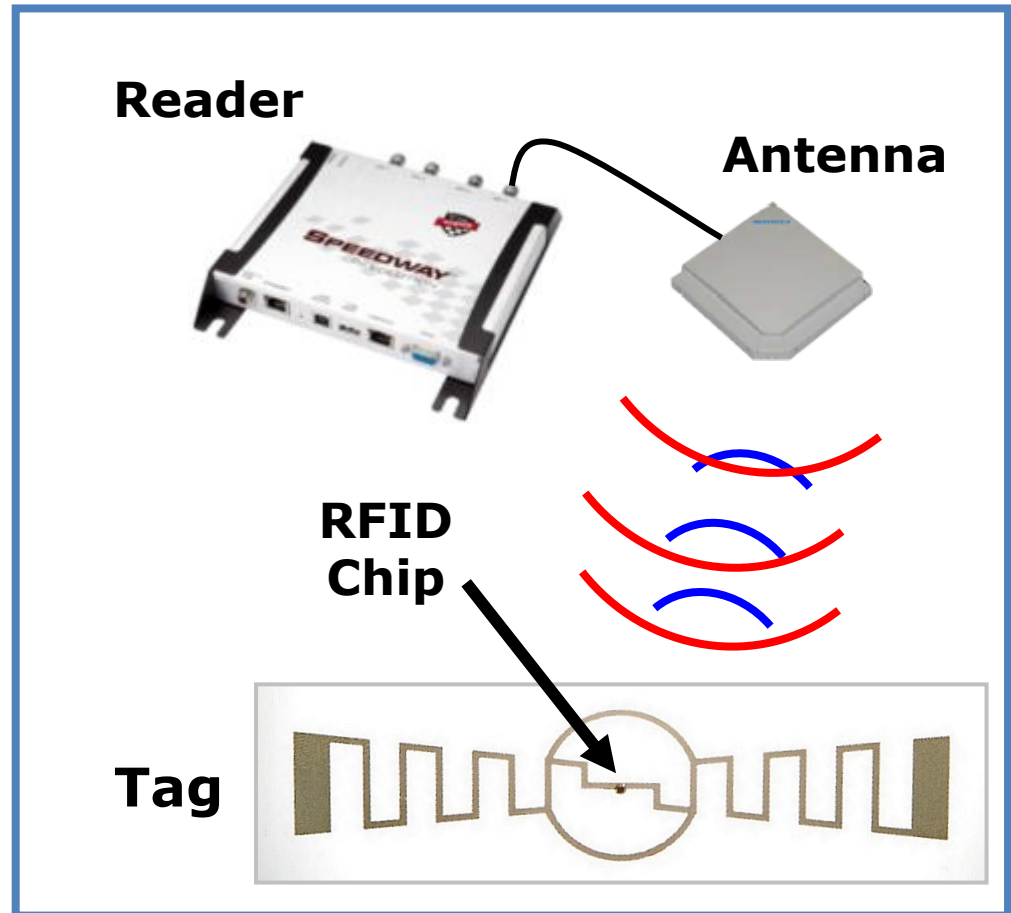- Can supplement existing

RTLS Exciters

- Used in choke points or localized areas.
- Short range 1-6 meters.
- "Excite" tag - Tag id + Exciter id sent to WiFi

Exciters

Stage 1

Stage 2

Stage 3

Cycle Time Monitoring

Check In/ Check Out

Mustering

Gate Management

FIND WHAT'S NEXT.

PROMAT 2015
McCormick Place South | Chicago
March 23-26, 2015
promatshow.com
powered by MHI
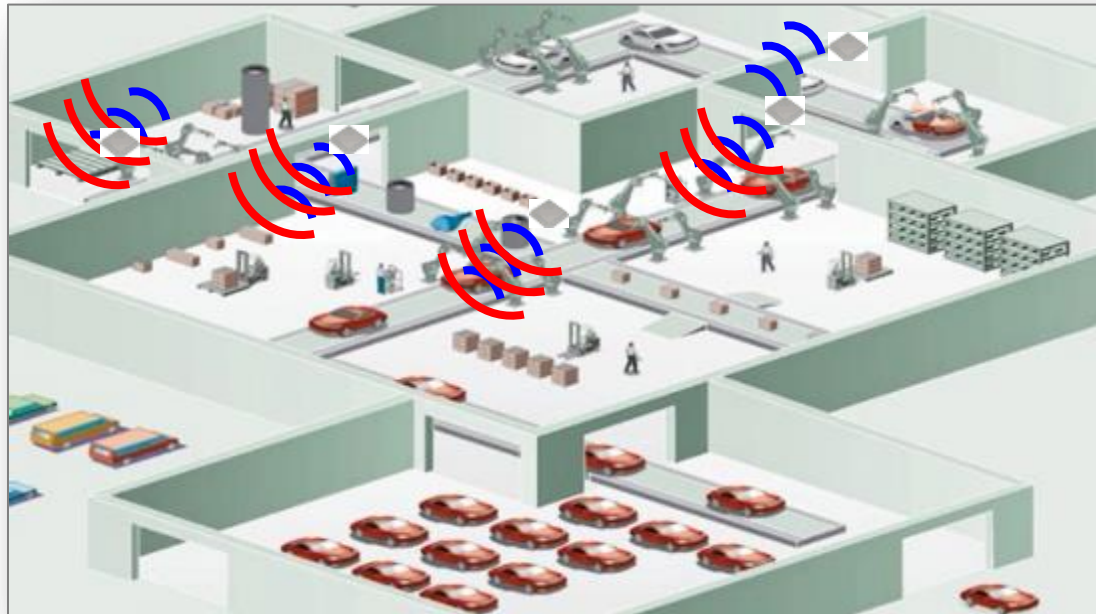
Passive RFID Technology Review

- Reader sends signal to tag
- Tag uses incoming signal as power source
  - No battery required

- Tag talks back to reader by *reflecting* the signal
  - Much like a moving mirror reflecting back light – "Backscatter"

Reader

Antenna

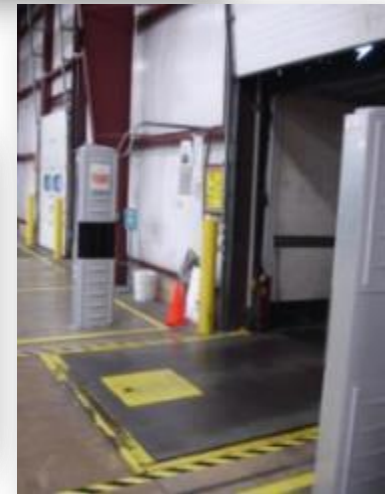**RFID Chip**

Tag

FIND WHAT'S NEXT.

PROMAT 2015
McCormick Place South | Chicago
March 23-26, 2015
promatshow.com
powered by MHI

Passive Tags Location

- Fixed RFID Reader locations
- Defined material flows
- Reports Last Known Location

FIND WHAT'S NEXT.

PROMAT 2015
McCormick Place South | Chicago
March 23-26, 2015
promatshow.com
powered by MHI

- Common Passive Applications
  - Asset Tracking / Visibility
  - Receiving
  - Ship Confirm
  - Physical Inventory
  - Returnable Tote Tracking
  - Box Count Validation

FIND WHAT'S NEXT.

PRO**MAT** 2015
McCormick Place South | Chicago
March 23-26, 2015
promatshow.com
powered by MHI
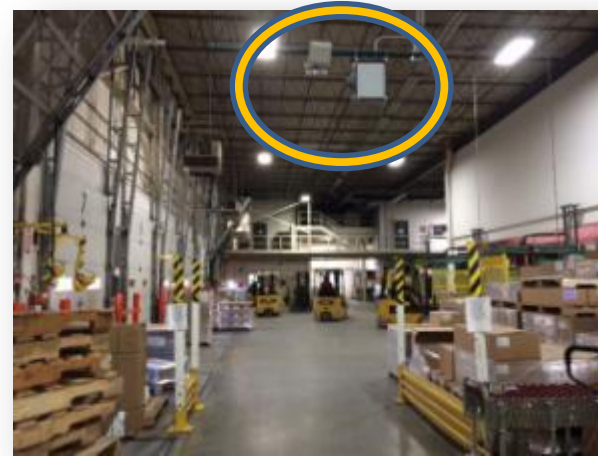
AGPS and Dual Mode Technologies

Dual Mode Tags

- Dual Mode WIFI and Satellite GPS
- Long Battery Life – IP 67 rated (-22F to 167F)
- Large outdoor areas with limited WIFI infrastructure
- Sensor features
- Transmission intervals configurable
  - Event based (movement)
  - User Defined

GPS Only Tags

- GPS based on Cellular triangulation
- Long Battery Life- Sealed and encased (-4F to 140F)
- Large outdoor areas no infrastructure needed
- Sensor Features
- Transmission intervals configurable
  - Event based (movement)
  - User Defined

MHI
THE INDUSTRY THAT MAKES SUPPLY CHAINS WORK™

FIND WHAT'S NEXT.

PROMAT 2015
McCormick Place South | Chicago
March 23-26, 2015
promatshow.com
powered by MHI

	Active RFID	Passive RFID	AGPS/Dual Mode
Best Features	•Real-time location •Uses existing Wi-Fi Network •Reusable tags w/replaceable batteries •Site-wide visibility	•Low Tag Cost •Small tag sizes and formats •Writeable memory •No batteries required	•Limited Infrastructure investment •Long Battery Lives •Configurable Logic
Limiting Features	•Tag cost and Size •Battery Life - long term storage •Insufficient Wi-Fi Coverage	•Read range •Last Seen Knowledge •Choke Point location limitations	•High tag cost •Long term storage/chain for custody on tag assets •Affixing Challenges
Best Use Cases	•Large area coverage •High value or high impact assets •Cell based manufacturing •Highly variable movement patterns	•High volume of assets • Lower costs assets •Continuous flow, narrow movement patterns IE: Conveyer Belts •Supply Chain operations	•Wide area coverage •Asset on 3rd party property •Visibility in transit •Sense movement

FIND WHAT'S NEXT.

PROMAT 2015
McCormick Place South | Chicago
March 23-26, 2015
promatshow.com
powered by MHI

The Case for Hybrid RFID

Consider a car manufacturer....

- Active RFID could track large, high value parts like engines or chassis in real-time
- Passive RFID could track smaller components stored in pallets, totes, or bins within a standard material flow

Challenges:

- Disparate data stuck in silos
- Operators needing to remember which tags track which assets
- No holistic view of assets

FIND WHAT'S NEXT.

PRO**MAT** 2015
McCormick Place South | Chicago
March 23-26, 2015
promatshow.com
powered by MHI
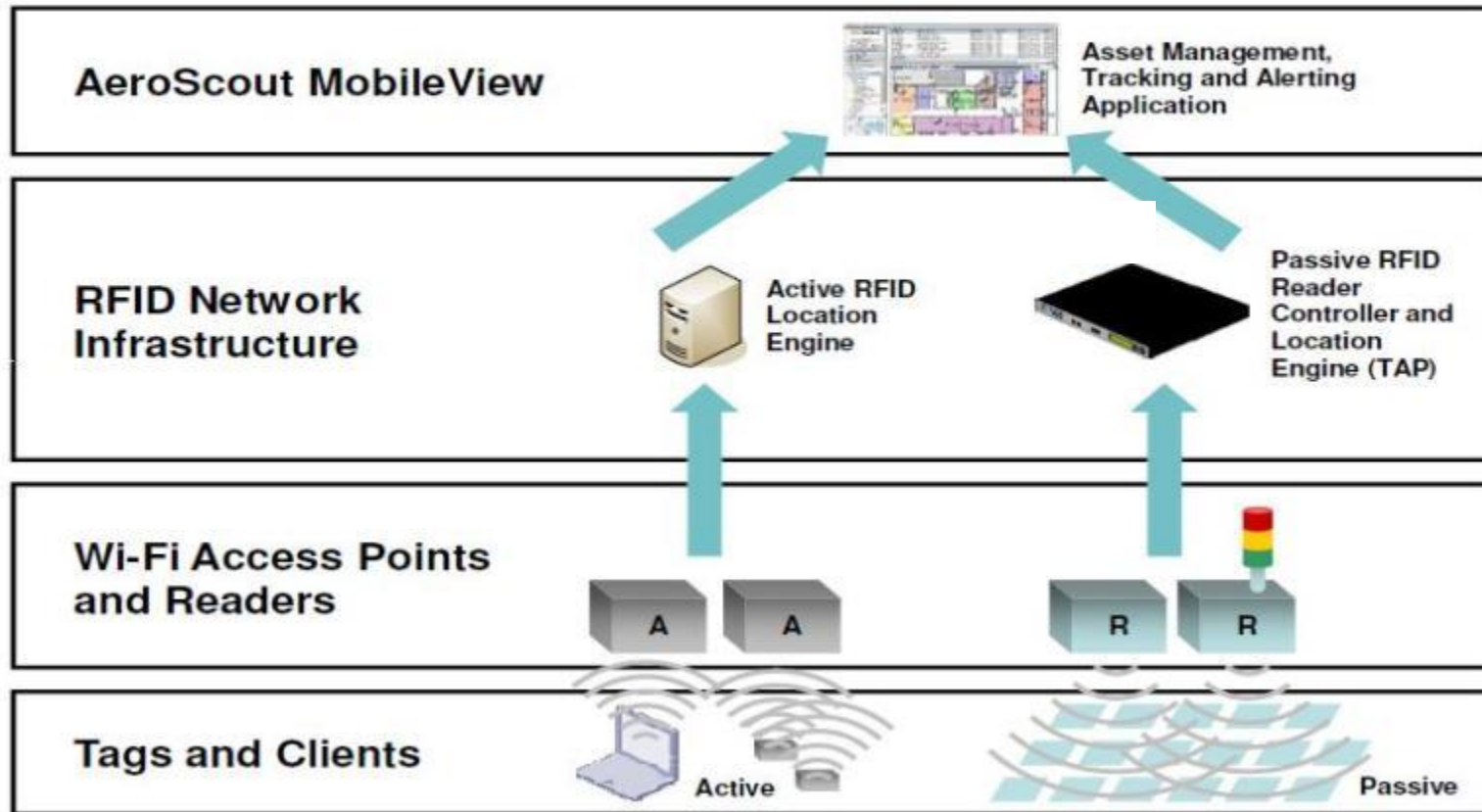
Great Hybrid Use Case

Large jet engine and gas turbine repair facility
- Critical to track major components in real-time
- Thousands of smaller parts with standard material flows

FIND WHAT'S NEXT.

PROMAT 2015
McCormick Place South | Chicago
March 23-26, 2015
promatshow.com
powered by MHI

Main Unit and Cart Tracking

- After arrival, the main engine gets disassembled at the beginning of the process

- The main unit and all the small parts that need to be repaired are separated and identified with paper bar-coded tags, to form one complete unit

- At the end of the processes that involves different shop floor operations, all the components are assembled back together into the main unit and shipped

Active RFID Tags on cart and main unit for location

FIND WHAT'S NEXT.

PROMAT 2015
McCormick Place South | Chicago
March 23-26, 2015
promatshow.com
powered by MHI

RFID Active + Passive = Optimum Traceability

Main Unit or Cart – 1 (x,y) — Active RFID Location

Comp. 1   Comp. 2   Comp. 3   Comp. N — Passive RFID Identification

- Location of Passive RFID components is based on position of Main Unit

Passive RFID Tags used on individual parts for ID

FIND WHAT'S NEXT.

PROMAT 2015
McCormick Place South | Chicago
March 23-26, 2015
promatshow.com
powered by MHI

Hybrid RFID = One System Delivers **Unified Visibility**

- Asset visibility for main engine components and small units

- Integrated to ERP

- Custom reports for parent/child association

FIND WHAT'S NEXT.

PROMAT 2015
McCormick Place South | Chicago
March 23-26, 2015
promatshow.com
powered by MHI

Hybrid RFID Case Study Results

- Full traceability of all components in one system
- All Systems integrated - MES, WMS and ERP
- Real-time TAKT Time tracking on major components
- Cut overall turnaround from 55 to 45 days
- Increased unit output by 18%
- Expediting ability for customer service and additional revenue

Combining active and passive in one system is more efficient, accurate, and connected.

FIND WHAT'S NEXT.

PROMAT 2015
McCormick Place South | Chicago
March 23-26, 2015
promatshow.com
powered by MHI

Benefits of Hybrid to Business Goals

Reduce Operational Costs
- One system for unified asset tracking
- Less loss and time wasted

Increase Revenue Opportunities
- Increased capacity without additional investment

Improve Customer Experience
- Faster turn times
- More accurate inventory

MHI
THE INDUSTRY THAT MAKES SUPPLY CHAINS WORK™

FIND WHAT'S NEXT.

PROMAT 2015
McCormick Place South | Chicago
March 23-26, 2015
promatshow.com
powered by MHI

In Summary, HYBRID RFID Equals:

- Single, holistic view into the location of assets and inventory
- Infrastructure capable of growing with your organization (future-proof)

Hybrid RFID delivers efficiency, accuracy, and connectivity

FIND WHAT'S NEXT.

PROMAT 2015
McCormick Place South | Chicago
March 23-26, 2015
promatshow.com
powered by MHI

For More Information:

Speaker email: tom.oboyle@barcoding.com

Website: www.barcoding.com/RFID

Or visit ProMat 2015 Booth 4263