

MAY 17 - 19, 2022

MANDALAY BAY | LAS VEGAS, NV

# RFID JOURNAL LIVE!

# RFID/IoT for Warehouse and Inventory Management

# Key Steps in Building an Inventory-Management RFID/IoT Solution: Build Your Own Portal

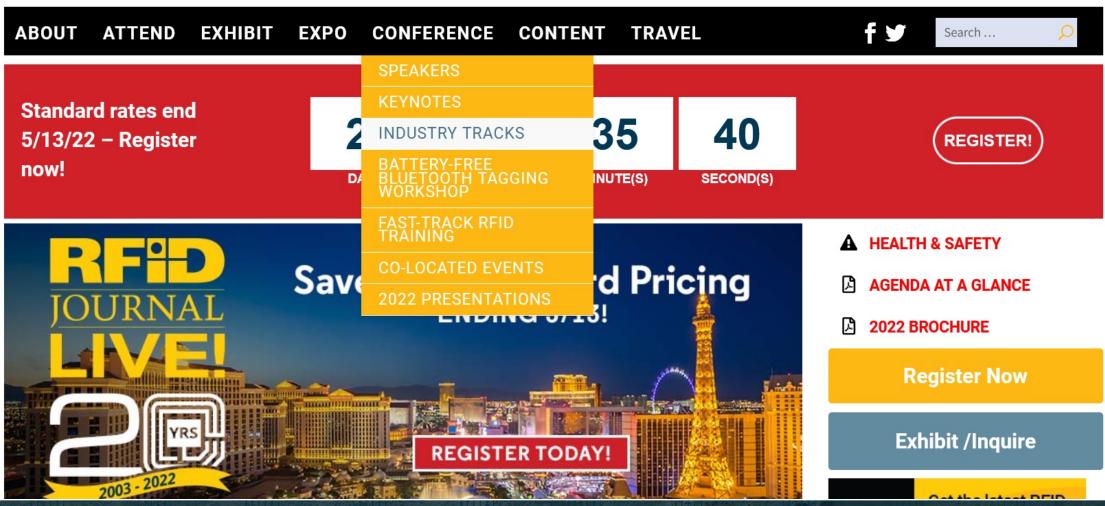
**Presenter: Samad Rostampour** 

Professor, Vanier College and IT director @ IoT Lab, Université du Québec à Montréal (UQAM)
With the collaboration of Ygal Bendavid director @IoT Lab, Université du Québec à Montréal (UQAM)



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# Today's Program

- ➤ 10:45 AM 11:30 AM: RFID/IoT in Warehouse & Inventory Management Basics
- > 11:30 AM 12:15 PM : Linking RFID to Inventory-Management Best Practices
- > 12:15 -13h00 PM : Lunch time
- > 1:00 PM 1:45 PM: Targeting the Correct RFID Technology for the Right Project
- > 1:45 PM 2:30 PM : Key Steps in Building an Inventory-Management RFID Solution: **Build Your Own RFID Portal**
- > 2:30 -2h45 PM : Break time
- > 2:45 PM 3:30 PM: Designing Your RFID Solution
- ➤ 3:30 PM 4:15 PM: Building Your RFID Business Case





# Your Presenter

### **Samad Rostampour**

- Professor @ Computer Science
   Department, Vanier College, Montreal
- IT Director, IoT lab., UQAM University, Montreal (<a href="https://labiot.uqam.ca/">https://labiot.uqam.ca/</a>)
- Judge @RFID Journal Award





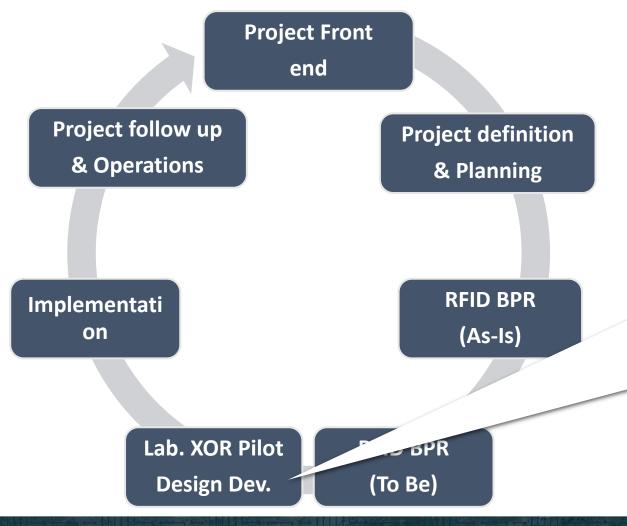


# Objective of the Presentation

- Describe the portal components & options
- Show how to build and configure a RFID enabled portal by yourself
- Understand how to move from basic RFID/IoT data capture to real-time transactions
- Demonstrate several warehouse & supply chain management scenarios



# Lab. Experiments & pilot



Build Your Own
RFID Portal &
test it on your
specific products
& processes





# Portal Components (physical Infrastructure)

### Typically consists of:

- RFID reader
- Antennas
- Cables
- Input devices
- Output devices
- Mounting & protective enclosure













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# 1. Connect the hardware together

- 2. Test and configure the portal
- 3. Connect to the portal via the middleware
- 4. Apply the business rules

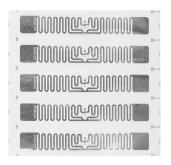






# Portal Equipment

### Our demo equipment



**RFID UHF Tags** 



**RFID UHF Antennas** 



RFID UHF Reader Impinj Speedway Revolution



**RFID Antennas Cable** 



RFID host system (& middleware)

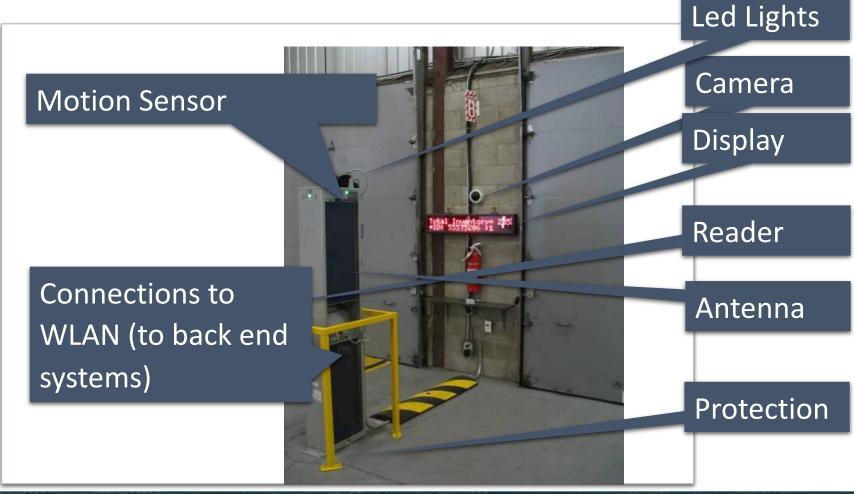


**Antenna supports** 



# Basic Demo Portal Equipment vs. Warehouse Equipment









- 1. Connect the hardware together
- 2. Test and configure the portal
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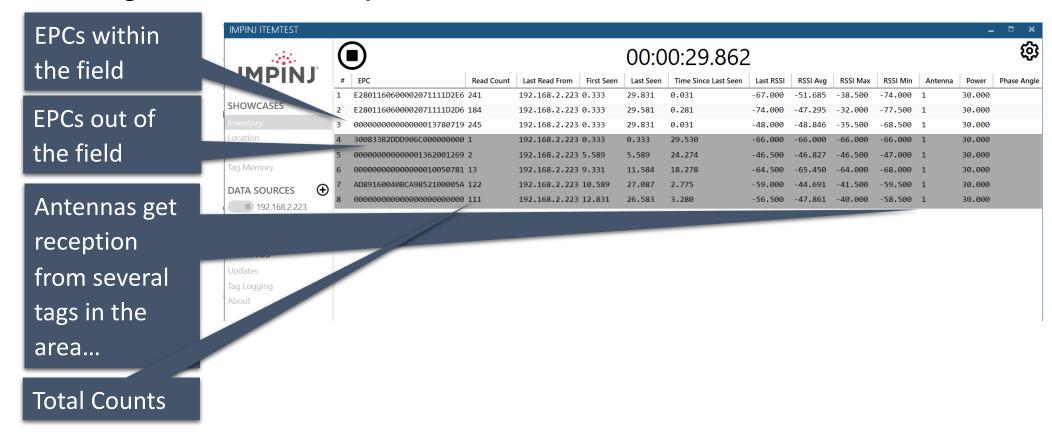


We are now capturing data





Test / Configure the RFID portal







- 1. Connect the hardware together
- 2. Test and configure the portal
- 3. Connect to the portal via the middleware
- 4. Apply the business rules







### The Middleware in the IoT Infrastructure

Select your integration

1

### **Applications/Analysis/transactions/Visualisation**

(Local application, Cloud/fog/edge based application, Mobile apps)

### **Information hosting/access/sharing**

(Local server, Cloud based server, Fog based, Edge based...)

### **Data Communication**

(Communication network - LAN, WLAN, WAN, MAN – LoRa, LTE-4G, 5G)

### **Data capture**

(RFID readers/antennas, BLE sensors, Wi-Fi, Li-Fi, Vision AI, IR, USID, Mobile robots, etc.)

### **Identification/Connected objects**

### **Tags RFID**

Active/ passive/ semi-passive

### Sensors

Movement, Light, Temperature, Etc.

### **Mobile devices**

Phones, Tablets, Mobile computers, lifi tracker, Etc.

### Wearables

Smart watch, Health& fitness tracker, BLE badge, etc

### None

The object as the identifier

ILABO IOT

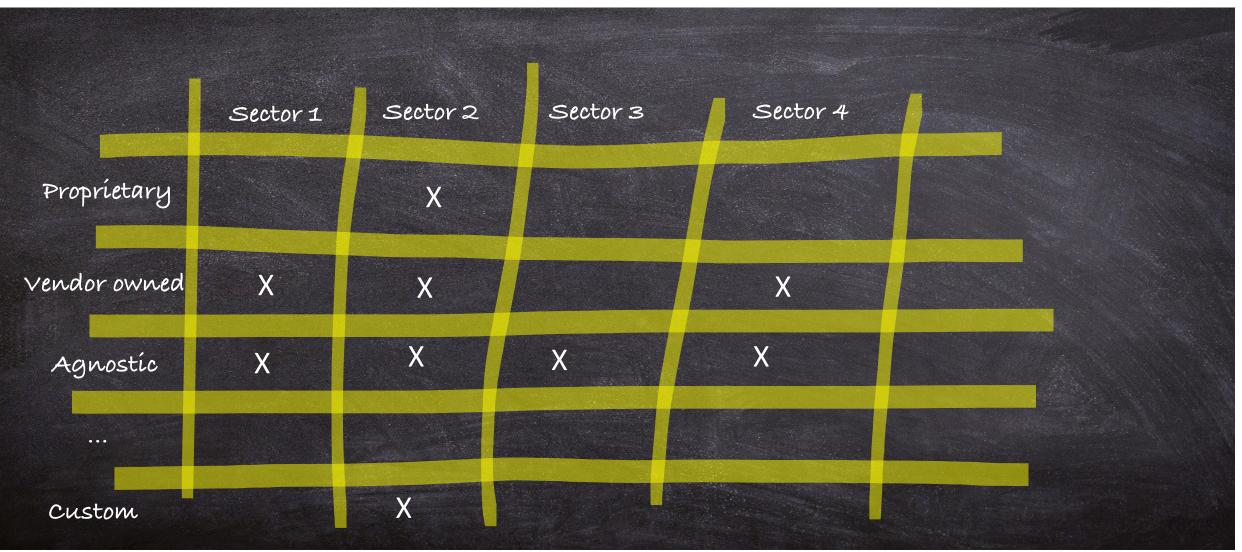


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Artificial Intelligence (IA)

Deep learning, reinforcement learning.

### Middleware RFID-IoT



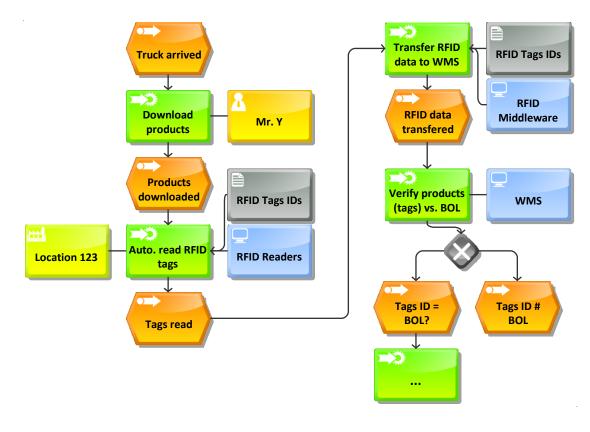




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# The Middleware used to demo our Logistic scenario



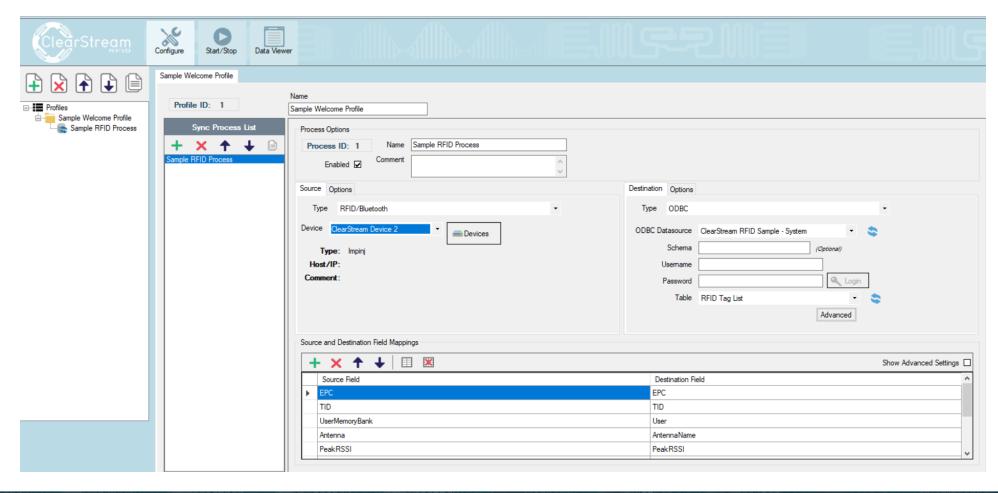


https://www.clearstreamrfid.com/





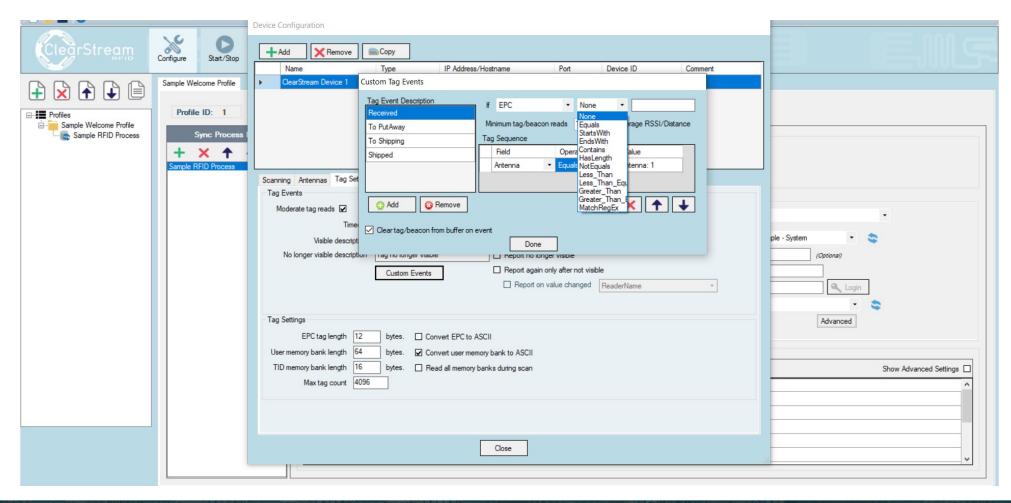
### Opening our Middleware







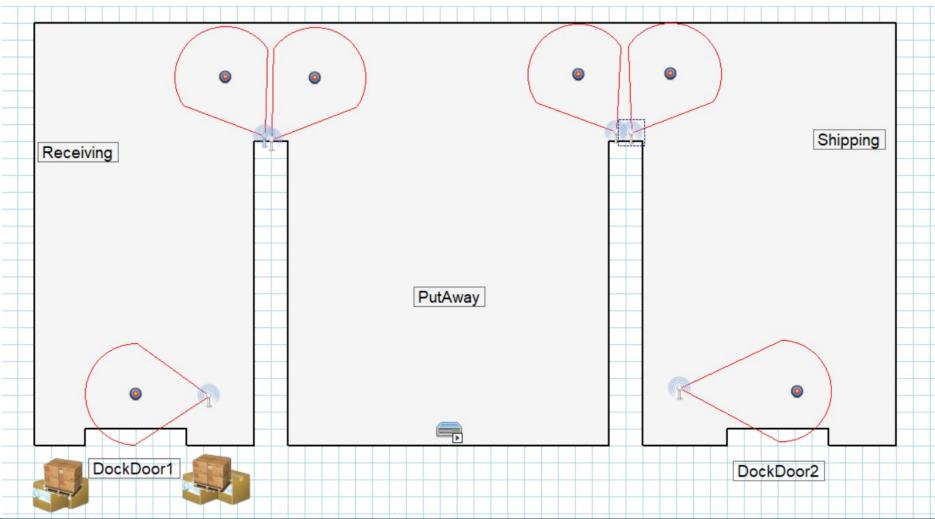
### Configuring the business rules







### Building our reading zones







# Tracking the logistics units in our reading zones

	EPC	TID	User	AntennaName	PeakRSSI	DateTime	ReaderName	StartEvent	Count	TagEvent	Direction	ID
•	ACAD0000000000010002543			Antenna: 1	91	4/21/2022 10:26	ClearStream Devi	Management Stu	1	Received		35709
	FCFF01103039000000000001			Antenna: 1	61	4/21/2022 10:26	ClearStream Devi	Management Stu	1	Received		35710
	FCFF01103039000000000002			Antenna: 1	56	4/21/2022 10:26	ClearStream Devi	Management Stu	1	Received		35711
	ACAD0000000000010002543			Antenna: 3	69	4/21/2022 10:26	ClearStream Devi	Management Stu	1	To PutAway		35712
	FCFF01103039000000000002			Antenna: 3	65	4/21/2022 10:26	ClearStream Devi	Management Stu	1	To PutAway		35713
	FCFF01103039000000000001			Antenna: 3	52	4/21/2022 10:26	ClearStream Devi	Management Stu	1	To PutAway		35714
	ACAD0000000000010002543			Antenna: 5	87	4/21/2022 10:27	ClearStream Devi	Management Stu	1	To Shipping		35715
	FCFF01103039000000000001			Antenna: 5	56	4/21/2022 10:27	ClearStream Devi	Management Stu	1	To Shipping		35716
	FCFF01103039000000000002			Antenna: 5	52	4/21/2022 10:27	ClearStream Devi	Management Stu	1	To Shipping		35717
	ACAD0000000000010002543			Antenna: 6	80	4/21/2022 10:27	ClearStream Devi	Management Stu	1	Shipped		35718
	FCFF01103039000000000001			Antenna: 6	57	4/21/2022 10:27	ClearStream Devi	Management Stu	1	Shipped		35719
	FCFF011030390000000000002			Antenna: 6	77	4/21/2022 10:27	ClearStream Devi	Management Stu	1	Shipped		35720

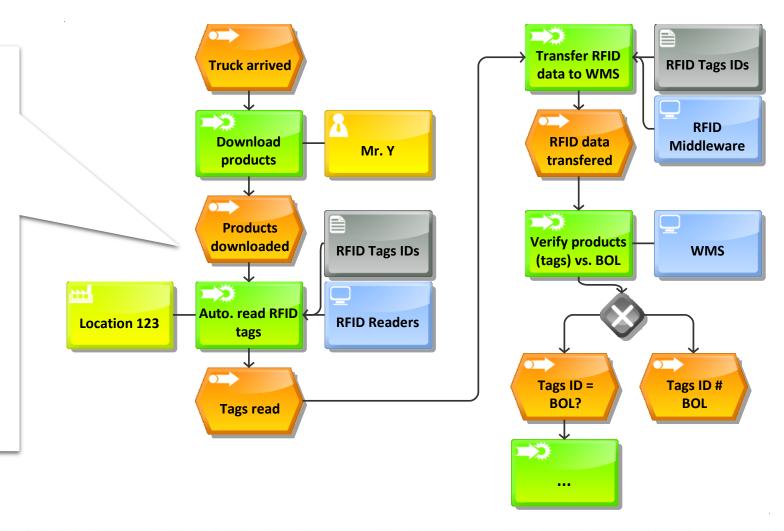




### Selected W&IM scenario

### **Build a Portal to:**

- Automatically receive logistics units
- Put them away
- Ship them!







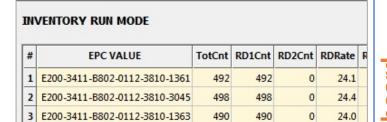
- 1. Connect the hardware together
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Lets conduct some real time automated transactions





## Apply the business rules





### Scanned Item @ Dock 1 (Designated Location GLN: 0000123)

ard	Туре	Logistics' Units		
pogu	Pallet ID (EPC)	E2003411B802011238101361		
Dasi	Box ID (EPC)	E2003411B802011238101363		
r 1	Box ID (EPC)	E2003411B802011238103045		

### Order Nb. R01000 completely received

**Associated ASN: 000856** 

Order Status: 14h:25



Dock

Order Nb. R01000 Successfully received Transaction confirmed in the ERP Required put away location: 0003





# Apply the business rules

Conducting transactions (e.g. automated receiving)

Pallet & boxes are automatically scanned at receiving dock and associated to a receiving transaction: i.e. verification against ASN & PO (order CR01501)

Receiving Order in progress:
The first pallet (& boxes) is automatically received

Receiving Order in progress:
The second pallet (& boxes) is still pending

Receiving Order in progress:

The PO stays open until the transaction is

completed



### ESG UQÀM

Order CR01501 partially completed

Product code	Description	ID (RFID/EPC)	Status/Received					
▼ ACAD00000000010002543 – 2 boxes								
DM1001	Вох	4CFF01100303900000000001	٧					
DM1001	Вох	4CFF011003039000000000002	٧					
▼ ACAD000000000010002544 – 2 boxes								
DM1001	Вох	4CFF01100303900000000003						
DM1001	Вох	4CFF01100303900000000004						
			# Pending Items: 2					

Status

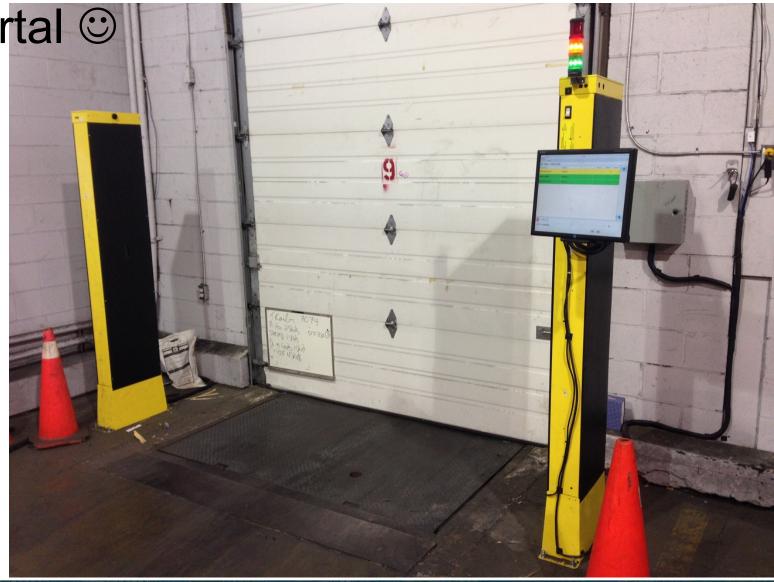


Pallet ACAD000000000000010002543 has been received.
Order CR01501 partially completed.





Build your own portal ©







# More simple W&IM solutions?

### And an ecosystem of solutions



### TagControl - Inventory Inventory management software

providing RFID-enabled real time visibility for the location and status of assets, equipment, and a range of fast moving items. Designed to accommodate warehouses, manufacturing facilities and more.





TagControl - Cabin

Use this application to conduct RFID-enabled safety equipment (and security checks) inside commercial aircraft. Strengthen regulatory compliance and make inspection tasks more efficient and effective.



RFID Scout can perform simplified RFID Inventory, assist in the identification of RFID Tag Models, conduct RFID Audits and help locate RFID tags.



B2B BFID Enabled Stock Control Application for Aesseal.



### **BradyConnect Inspector**

A companion app to the BradyConnect website, the Brady Inspector App is a tool allowing safety professionals to streamline the inspection of



Use this app together with a TSL UHF RFID Reader to read, write or lock your RFID-transponders.



Automate the scanning and GreenBar can save you time and improve the accuracy of your fixed asset data.



Noomist makes it easy to manage complicated coin inventories and quickly create purchases and invoices so you can spend more time turning deals and making money.





























The OASES mobile application has been designed to bring the functionality of OASES to iOS phones and tablets.



Grey Trunk RFID is a beautiful out of the box solution to help



RFID Laundry Asset Tracking.



### **RFIDAeroTrack**

RFIDAeroTrack tracks and monitors the movement of items that are RFID-tagged within a fixed-reader environment or with the use of RFID handheld scanners.





### CoreRFID Blaze





A custom RFID tracking solution designed to scan and track RFID



Wynne's customers the ability to securely view and make changes to assets on the core



RentalResult ASv2 provides for



RentalResult INVv2 provides for RentalResult LPv2 provides Wynne's customers the ability to Wynne's customers the ability to conduct inventory searches on a securely pick assets as part of the RentalResult ERP system Transport Picking and Logistics functionality.















Download on the App Store

















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