Uniform Tracking System

WHITE PAPER

RFID4u®
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INTRODUCTION

Managing the entire uniform and laundry inventory and the lifecycle of each individual garment from purchasing through daily use, cleaning, and dispensing all the way to final disposal, requires a comprehensive system within the company. The interoperability of such system is especially important when the cleaning or laundering is being outsourced.

The RFID4U Uniform Tracking System provides full inventory receiving, tagging, tracking, and issuing capabilities utilizing a combination of technologies including RFID, barcode, and NFC technology including Handheld and Fixed Readers, Sensors, Wi-Fi and local networks, and the Internet.

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1. SOLUTION OVERVIEW

Hotels, restaurants, amusement parks, hospitals, military and government, manufacturing plants and service facilities issue uniforms to their employees on a daily basis. In addition, they also often handle large quantities of towels, linen, draperies and other reusable fabric items. All garments and other items have to go through the collection, cleaning, storage and issuance processes quickly and efficiently and not get lost, misplaced, damaged or issued incorrectly (right item to the wrong person or a wrong item to the right person).

To solve this challenge, RFID4U has designed a Uniform Tracking Systems that can be utilized for any kind of washable or dry-cleanable item from uniforms to linen.

System Applications:

- Each individual item (shirt, jacket, boots, hat, etc.), if tagged with an RFID or NFC tag, can be tracked separately, rather than as a class of items.
- Complete inventory management.
- Easy lot identification and control.
- Locating a specific item.
- First-In-First-Out processing.
- Issue and track uniform items based upon a pre-determined item issue list, validation against the list.
- Track wear and tear, number of laundry cycles and repairs.
- Assignment to personnel, prevent and track loss and damage, automatic return.

Software:

Our **Uniform Tracking Solution** is based on **TAGMATIKS**, our cutting-edge enterprise, cloud-ready sensory adaptive network software platform, that enables rapid deployment and integration of scalable, real-time visibility solutions, for enterprise asset management, inventory control, warehouse management, access control, apparel tracking, work-in-process tracking, reusable assets tracking, campus tracking, construction management, security, anti-counterfeiting and other applications.

The system provides real time visibility tools, analytics and dashboards, that are available for smartphones and tablets for making time-critical decisions on the road. We support all Android, iOS and WM mobile devices.

Hardware:

What used to be a domain of low or high frequency in laundry tags is increasingly being supplemented by UHF, which allows for longer read ranges, reading more tags at the same time and expanded user memory.

HID Laundry Tags
Laundry tags have to survive high temperatures, various chemicals and harsh environments in tunnel washers, water extractors and tumblers and most are encapsulated into various plastics and are in form of a small disc or button, which are to be sewn in. There are also tags that are soft and flexible and have thermosetting adhesive for direct fixation on the garment using thermo patching process.

There are several options for readers:

- Handheld readers for manual scanning
- Table embedded readers (articles are stacked or moved across)
- Attached to laundry chutes
- Placed outside lockers
- On or near bins, crates and collection baskets
2. UNIFORM TRACKING SYSTEM SOFTWARE

From the main menu, you can access the following processes:

- Stock Entry
- Issue
- Portal Issue
- Admin
  - Inventory
    - Product Master
    - SKU Master
    - Issue Master
  - User Management
    - Create New User
    - Change Password
    - Edit User
  - Device Status
  - Sync Mobile Database
  - Reconciliation
  - Portal Reader – Historic Information
- Dashboard
  - Inventory Details
  - Issued Item Details
  - Order Details
- Reports
  - Available Stock
Stock Entry Screen

The Stock Entry screen allows for:

- Product receiving by scanning the UPC code (barcode) of the product or by manual SKU entry, and the system will get all the product information from the database and display the information on the screen.

- RFID Number Generation - the system will get last running number from the Inventory Master Table and generate the RFID numbers based on the product count entered by user. The RFID number is the combination of UPC number and serial number. RFID number has 24 digits. The first thirteen digits refer the corresponding UPC number and the next eleven digits refer the serial number in hex format. The user can see the generated RFID numbers in data grid.

- Printing the generated RFID Tags.
Uniform Issue and Verification

The uniforms are issued based on a Gender, Issue Name, Device Name (associated with the location where the item is being issued) and Order Number, and these parameters have to be selected before the issue can be verified. The system compares the order number with existing numbers and will not accept duplicate values.

The verification screen is divided into three parts:

- **Allocated Items**: The system gets the allocated items from the Uniform Issue Master table based on the selected parameters.
- **Actual Items**: The actual items are the items physically issued and picked from the selected smart table. If the allocated and actual items are same then only the accept button enabled. Otherwise the user cannot accept the scan.
- **Details** – such as Scan Status that shows details about the process like date, number of total, accepted and rejected scans, and other details as required by the customer; and a Device Status, which shows the device name and the status, such as Ready, Reading, or Error.

The user starts the scanning/verification process by clicking the “Start Scan” button. After getting all the information from the RFID server, system compares the actual list with allocated items. Based on the comparison, it gives the status. The status may be one of the following:

- Missing
- Ok
- Inventory Exceeds Limit / Inventory Low
- Size Mismatch (By moving the cursor to particular row user can get all the SKU and corresponding quantity)
- Extra Product

The Scanning process can then be accepted or cancelled and the scan details can be printed in form of a report. The user can continue with another scan or can complete the order.
Portal Issue

There is another option for issuance using an RFID portal, instead of RFID Smart Table.

The portal reader reads all the tags passing through the portal. If the Start button is pressed, then the portal reader starts to log all the read tags. It does not consider whether the tag is issued or not between the start and stop time. The system will get all the read tags between the particular times and show it in the data grid. The already issued items are marked as orange color and not issued items are marked in green color. The User can select either already issued items or not issued items. The user cannot select both at a time. The user can do anyone of the following actions for selected item.

- **Add** – It will add the selected items into the Item Details table and increases the inventory.
- **Reduce** – It will move the selected items from Item Details table to Issued Item Details table with issued time and device name.
- **No Action** – The system will not do any action for selected item.
Admin
The Admin functions can be accessed by an Administrator only. The functions include:

- **Inventory**
  - Product Master – used to add new product into the master database and includes product name, description, size, gender and other parameters.
  - SKU Master - used to enter Stock Keeping Unit number for particular product size.
  - Issue Master - used to configure the allocated product for every issue and allocated number of items for every product.
- **User Management**
  - Create New User
  - Change Password
  - Edit User
- **Device Status** - the status of any registered device.
- **Sync Mobile Database**
- **Reconciliation** - the Reconcile screen is used to compare the actual and database quantity. If there is any deviation, then the user can update the inventory to actual quantity.
- **Portal Reader** – Historic Information

### Product Master

![Product Master Screenshot](image-url)
Dashboard

There are three dashboards specified in the system, however, it is possible to create others per customer requirements.

- Inventory Details
- Issued Item Details
- Order Details

Inventory Details Dashboard

In this dashboard the user can view the following information:

- Product
- SKU
- Description
- Quantity
- Total Inventory Cost

By default, this page shows only the name of the product.

If the user clicks on the product in left data grid, system will get all the relevant information from the Inventory Master table.
Issued Item Details Dashboard
In this dashboard the user can view all issued items in a day or in some time period (last 7, 30, 90 days). If the user clicks on date, then the system displays product issued in the particular day. If the user clicks any one of the product, the system will display the information grouping by device name category (i.e. Male Smart Table, Portal, ....)

Order Details Dashboard
In this dashboard the user can view all issued items for an order in various time periods (7, 30 or 90 days).
Reports

There are four main reports specified in the system, which have the same report layout and show:

- Available Stock
- Received Items
- Issued Items
- Order Details
3. HANDHELD RFID READER APPLICATION

To supplement the desktop application related to the RFID Smart Tables, a handheld application can be implemented. The advantage of a handheld is that it can help not only with the issuance and receiving, but also tag location and various other activities on the go.

Main Menu

The following menus are available in the menu screen:

- Item Details - to get the details of the items that the RFID reader reads, When the User Selects an Item from the Item Details form the following details of the selected Item will be shown in the Get Info form. Item ID, Product Name, Item Description, SKU, UPC
- Locate Tag – Tag is located based on user’s input
- Qty on Hand
- Issue Items
- Return Items
- Cycle Count
- Adjustments
- Exit
Issue Items

The Issue Items Form is used to issue the Items that the User selects in the Grid. The tags are read either by using “Start Read” button or trigger. Then the User should select the tags that are to be issued and then click the Issue button. The system will check for the tags that are in the Item Details Table that is in the Server Database and will move the item to the Issued Item Details Table and reduces the Stock.

Return Items

The return Items Form is similar to the Issue Items form and is used to Return the Items that the User Selects in the Grid.

Qty on Hand

The Qty on Hand form is used to find the Quantity of a particular that is available on hand. The Quantity on hand is being searched by SKU.

Cycle Count

The Cycle Count form is used to get quantity for all read SKU's. The items are grouped by SKU.

4. BENEFITS

- Eliminates many labor-intensive manual tasks, such as separating and hand-counting uniforms being sent to the laundry.
- Automatically processes laundry in batches, carts and racks for automated shipping and receiving.
- Fast on the spot inventory count using a handheld or mounted readers.
- Ultimate visibility of uniform location and status, length of time at each location (especially in the laundry facility or cleaners).
- Allows for FIFO processing (to ensure equal wear and laundry).
- Automated issue and tracking items based upon a pre-determined Item Issue List including validation and reporting.
- Automated dispensing cabinets where employees can collect their uniform. After the employees scan their ID badge, the cabinet door unlocks and they are presented with their assigned uniform. Garments are returned for cleaning by throwing them into an assigned cart or sending them down a chute where a reader will register their return.