# Studio 5000 JFK Lot Tracking

(For use with Traceability Application v11.11.0 or newer and PLC JFK Routine v2.1.2 or newer)

Global Common

SD-1054

ISSUED August 27, 2021
REVISED

Table of Contents

# 1 Scope and Purpose

## 1.1 Scope

1.1.1 This specification describes the traceability application configuration and PLC logic design requirements for Nexteer Automotive facilities utilizing Nexteer's Traceability System.

1.1.2 This specification applies to the equipment requiring Traceability communication for process flow, electronic error proofing, and data collection. Refer to the Manufacturing Engineer's written specification for details regarding traceability requirements.

1.1.3 This specification has associated PLC logic routines and HMI screens that reflect the requirements of this specification. In addition, the logic library provides the required routines and examples that may be applied to new equipment designs. All files are available at www.nexteerdataexchange.com.

1.1.4 The use of the word "shall" indicates requirements and the use of the word "should" indicates recommendations. The use of the word "may" indicates permission or allowance and the use of the word "can" indicates a possibility.

## 1.2 Purpose and Objectives

1.2.1 The purpose of this specification is to provide Nexteer requirements and guidance to Original Equipment Manufacturers (OEM) for use in their PLC logic designs to interface with Nexteer's Traceability System and to provide device configuration guidance for the Traceability application.

1.2.2 The objective of this specification is to provide common, maintainable, and cost-effective traceability controls systems that enhance both the productivity and ease-of-use of the system, while ensuring the quality of Nexteer products produced. The application of this specification will result in common traceability controls systems.

1.2.3 The Nexteer traceability systems are integrated at the machine, cell (group of machines), or asynchronous assembly line level. Depending on the configuration of the traceability system, it may cover multiple cells and / or multiple asynchronous assembly lines.

1.2.4 The Nexteer traceability system uses a Traceability computer, which runs the Nexteer Traceability Application and interfaces with the SQL Server traceability database.

1.2.5 This Document shall be used in conjunction with the Nexteer Traceability Input Document to configure and program the Traceability Program and PLC Logic

# 2 JFK Lot Tracking

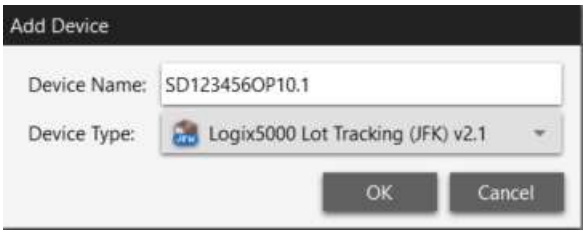
The R25_LotJFK_V2_1 routine shall be utilized when a component or many components are introduced to one or many operations that are not individually serialized and have a JFK barcode label on the container(s) that is required to be recorded as part of the Traceability data. The JFK lot tracking routine will check for quantity left in the container(s) and if the serial number is expired, blocked or blacklisted. Note: This routine can support up to 10 components with different barcode readers. If more components are required contact Nexteer MFG IT for required UDT modifications.

## 2.1 Traceability Application Configuration

### 2.1.1 Add a device connection.

1. Create a new device by clicking menu Edit > Add Device , or by right clicking the Devices list on the left side of the app and using the context menu.

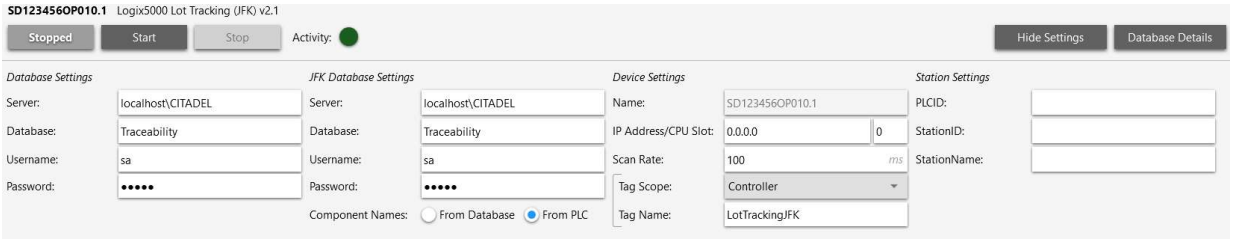

2. A dialog that is used to configure the new device connection will appear.
   a. Enter a name for the device. For example: SD123456X01, SD123456X51, SD123456OP010.1, SD123456ST02, etc. Note:
   b. Set the device type to Lot Tracking (JFK) v2.1 .
   c. Click OK to finish adding the device connection.




### 2.1.2 Device settings panel.

1. Ensure that the newly added device connection is selected by clicking on it in the Devices list on the left side of the app. Click the Show Settings button to display the device settings.

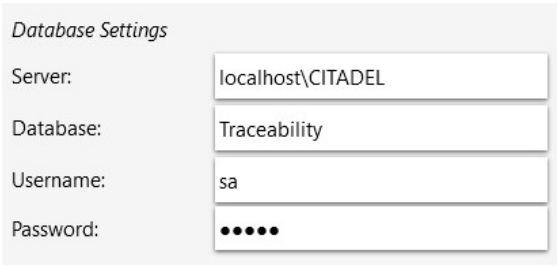
2. The following panel will be displayed. It is used to configure the database and PLC connection settings.




### 2.1.3 Configure Database Settings

The default database configuration settings normally do not require modification at MQ1.

For MQ2 the settings shall be supplied by the destination plant.

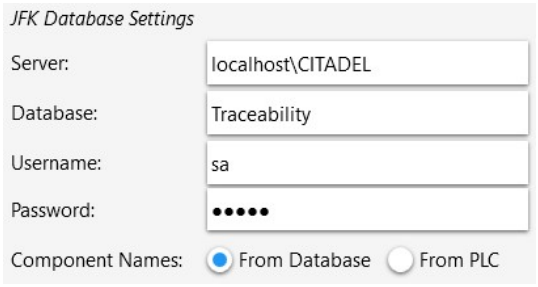



1. Server: The default Microsoft SQL server name is "localhost\CITADEL" which contains the standard Nexteer traceability database.
2. Database : The default database name is "Traceability".
3. Username/Password : This contains the credentials for the authorized database user. The default username is "sa" and password is "admin".

### 2.1.4 Configure JFK Database Settings

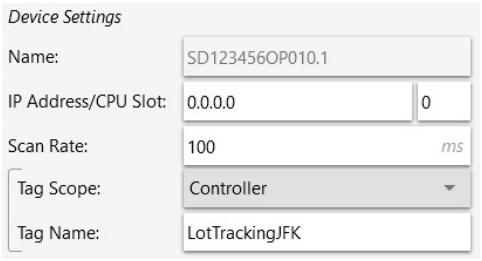
The JFK database configuration settings should be set as specified below for MQ1.

For MQ2 the settings shall be supplied by the destination plant.




1. Server: The default Microsoft SQL server name is "localhost\CITADEL" which contains the standard Nexteer traceability database.
2. Database : The default database name is "Traceability".
3. Username/Password : This contains the credentials for the authorized database user. The default username is "sa" and password is "admin".
4. Component Names: Check 'From Database' if you would like to get the Component description from the JFK Database or check 'From PLC' if you would like to get the Component description from a PLC tag. Typically, 'From Database' is used unless the description for the component is not adequate.

5. Configure Device Settings
6. IP Address : Enter the IP Address of the PLC.
7. Scan Rate : The default scan rate of how often the software polls the machine for new data is “100” milliseconds. This should not require modification.




8. Tag Scope / Program Name / Tag Name : The default tag name is “LotTrackingJFK”. This is a user defined tag in the R25_LotJFK_V2_1 routine containing the tag structure needed to interface with the traceability application. When multiple R25_LotJFK_V2_1 routines exist in the same program, this tag name shall be unique. The following 3 settings are used to configure a reference to the tag.

   Note: Typically, only one R25_LotJFK_V2_1 routine is required per PLC.

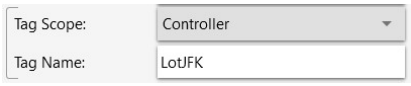
   a. Tag Scope : Select the scope of the PLC tag.

      Note: Typically, Tag Scope for the UDT should be set to a Controller scope tag.

   b. Program Name (optional) : If Tag Scope is set to “Program”, this setting will be displayed. Enter the name of the program within the PLC where the tag resides.

   c. Tag Name : Enter the name of the PLC tag.

   Example (Controller Scope):

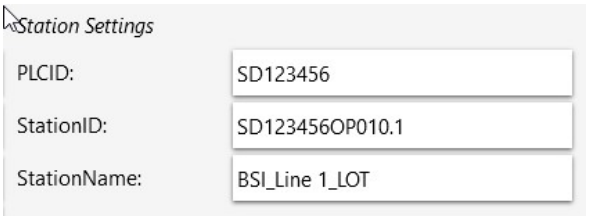



   Example (Program Scope):

### 2.1.5 Configure Station Settings

1. PLCID : Enter the machines SD number for the PLC ID. For example: SD123456.
   a. StationID : Enter a unique Station ID for the device configuration. For example: SD123456X01, SD123456X51, SD123456OP010.1, SD123456ST020, etc…

   Note: This should be match up with the Station ID under Lot Information on the Traceability Input Document.




| Lot Information | | | | | |
|---|---|---|---|---|---|
| ME REQUIRED SECTION | | | | | CONTROLS REQUIRED SECTION |
| Component Description | Lot Type | Lot Box Quantity | Lot Unit | Lot Decrement per cycle | Traceability Station ID = SD Number + (Xy or OPxxx.y or STxxx.y) |
| Inner Tie Rod | JFK | 1000 | Piece(s) | 2 | SD123456OP010.1 |
| Mounting Stud | JFK | 450 | Piece(s) | 2 | SD123456OP010.1 |
| Washer | JFK | 600 | Piece(s) | 2 | SD123456OP010.1 |

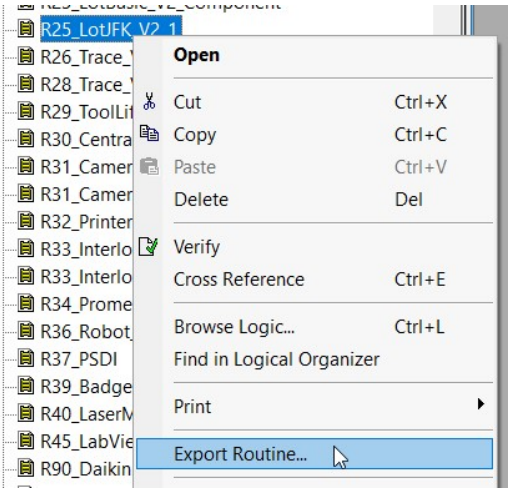
2. StationName : Enter a description for the station. The recommended station name should include the machine / cell or line. For example: BSI_Line 1_LOT.

## 2.2 Logic Configuration (R25_LotJFK_V2_1)

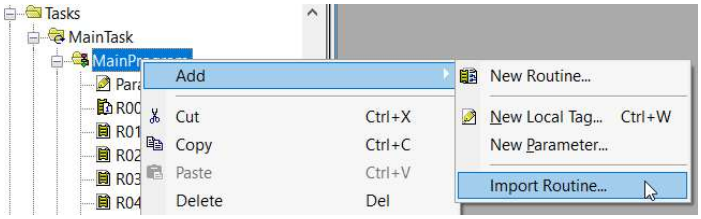
This routine is used for JFK LOT permissions for all configured LOT components for one PLC logic application. The logic in this routine shall be modified to meet the requirements of the application.

### 2.2.1 Importing the Routine

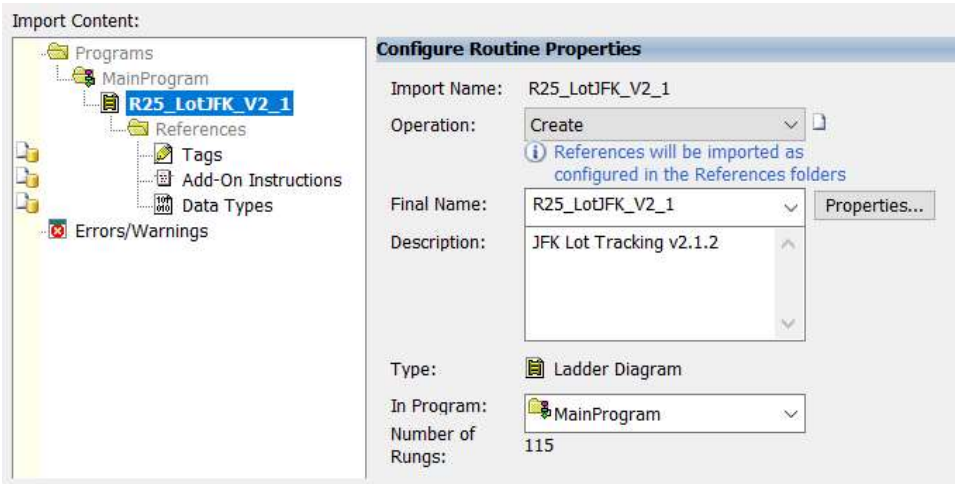
1. Export the R25_LotJFK_V2_1 from the Nexteer PLC library program by right clicking on the routine and clicking Export Routine… . Save the file to a location on your hard drive.



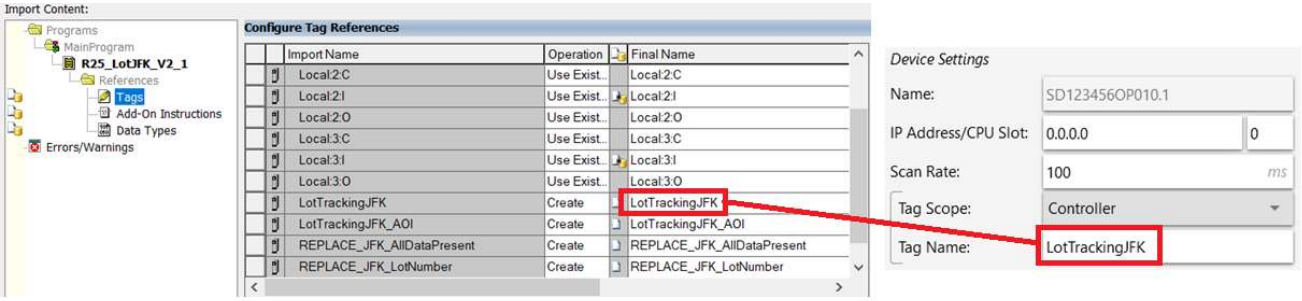
2. Right click on the Main routine of the PLC program that R25_LotJFK_V2_1 needs to be imported into and click Add > Import Routine in the context menu. Browse to the location that exported routine was saved to and click Open.




3. The Import Configuration dialog will appear. All of the default values as shown below can be used.




4. Click on the Tags option in the Import Content tree. The LotTrackingJFK Tag name must match the Tag Name in the Traceability Device Setting for this station.



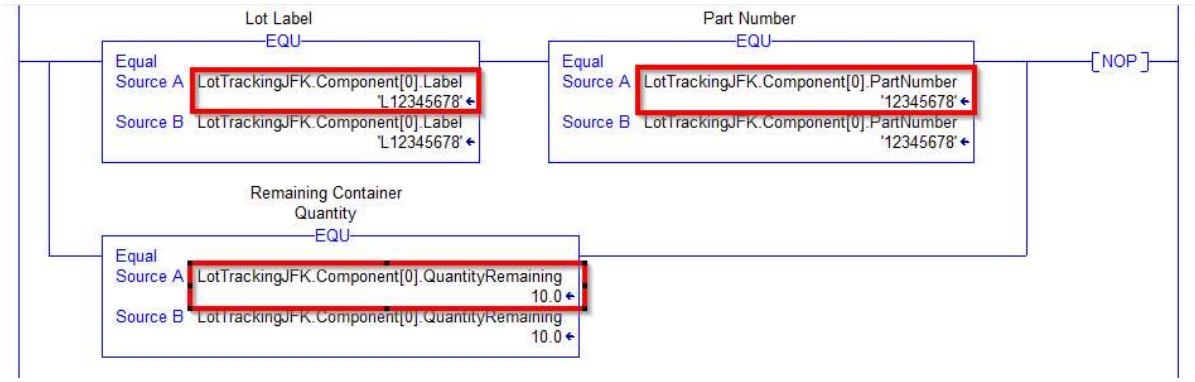
### 2.2.2 General Configuration

1. "HeartbeatTimeout" - Shall be used in the machine cycle stop fault routine to trigger a fault indicating the communication with the traceability system has been interrupted.


2. "REPLACE_JFK_LotNumber" - Shall be replaced with the appropriate tag containing the Lot number from the appropriate R24_CodeReader_LOT routine.
3. REPLACE_JFK_AllDataPresent" - Shall be replaced with a tag that indicates that the JFK Lot Barcode has been scanned and that the Lot Serial number is valid.


### 2.2.3 Component(0) Information

1. "Lot Label" - Barcode value scanned from the component box or container.
2. "Part Number" - Component part number retrieved from JFK system.
3. "Remaining Container Quantity" - Quantity remaining for the component box or container.

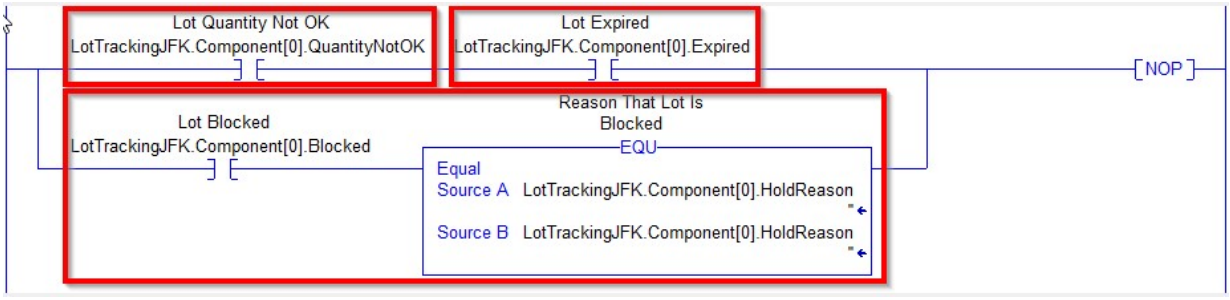


### 2.2.4 Component(0) Status Information

1. "LotOK" - Shall be used in the machine logic (Sequence) to allow the part to process a cycle.
2. "LotNotOK" - Shall be used to trigger a fault or message indicating that the lot is NOT OK to process.
3. "QuantityLow" - May be used to trigger a message indicating that the box or container quantity has gone below the low level threshold.

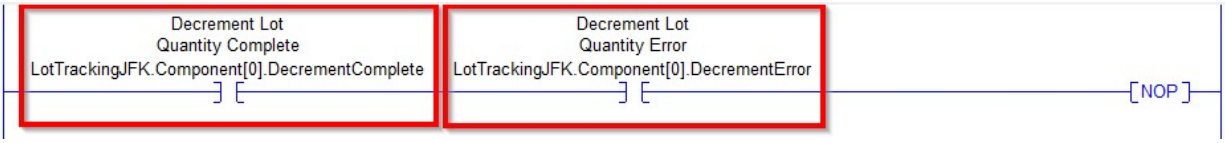

### 2.2.5 Component(0) Lot Not OK Reasons

1. “Lot Quantity Not OK” – If the Amount left in the Lot plus the Overflow amount is less than or equal to 0 this tag will become enabled.
2. “Lot Expired” – If the expired date of the Lot in the JFK system is older than the current date this tag will become enabled.
3. “Lot Blocked” – If the JFK system has this Lot blocked, this tag will become enabled and you will get a reason as to why this Lot was Blocked.




### 2.2.6 Component(0) Decrement Request Statuses

1. "Decrement Lot Quantity Complete" - Enabled when a decrement request has been completed.
2. " Decrement Lot Quantity Error " - Enabled if a decrement request fails.



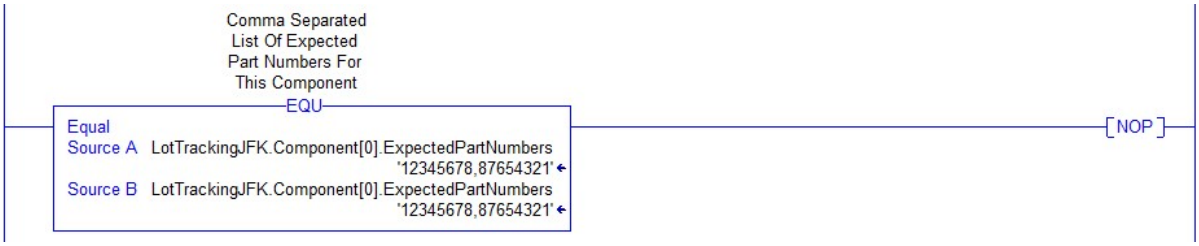
### 2.2.7 Component(0) Name

1. "Name" - Shall be set to a value that describes the component. Note: Traceability software v11.12.1+ can be configured to retrieve the component name from the JFK database automatically or using this tag in the PLC.


### 2.2.8 Component(0) Expected Part Numbers

1. "ExpectedPartNumbers" - Shall be set to a comma separated string that contains all of the acceptable part numbers for this component. When a label is scanned, the part number is retrieved from the JFK system and compared against the part numbers specified in this string to determine if the label number should be copied to this component.

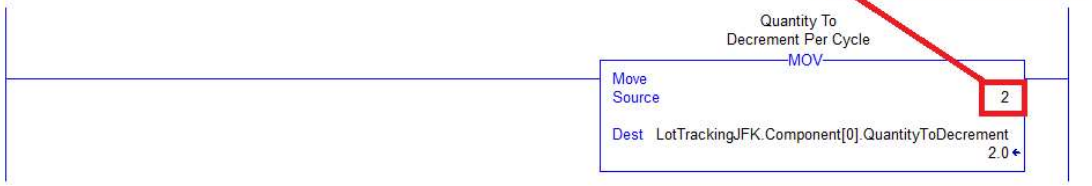
   For Example: If there are two compatible part numbers that can be used for this component interchangeably (12345678 and 87654321), the expected part numbers value should be set to "12345678,87654321".




### 2.2.9 Component(0) Quantity to Decrement

1. "Quantity To Decrement Per Cycle" - Shall be set to the amount the box or container quantity is decremented each machine cycle as defined on the Traceability Input Document.

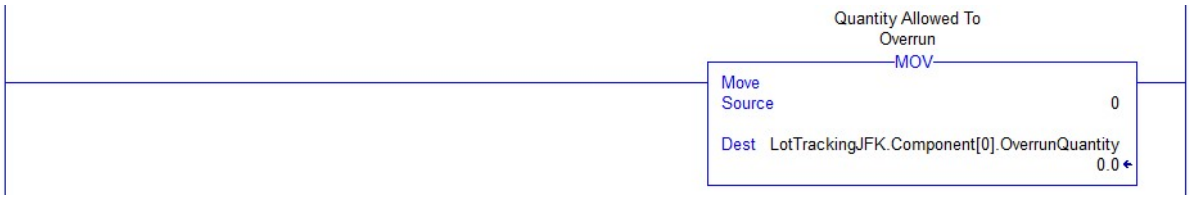
| Lot Information | | | | | |
|---|---|---|---|---|---|
| ME REQUIRED SECTION | | | | | CONTROLS REQUIRED SECTION |
| Component Description | Lot Type | Lot Box Quantity | Lot Unit | Lot Decrement per cycle | Traceability Station ID = SD Number + (Xy or OPxxx.y or STxxx.y) |
| Inner Tie Rod | JFK | 1000 | Piece(s) | 2 | SD123456OP010.1 |
| Mounting Stud | JFK | 450 | Piece(s) | 2 | SD123456OP010.1 |
| Washer | JFK | 600 | Piece(s) | 2 | SD123456OP010.1 |



### 2.2.10 Component(0) Overrun Quantity

1. "Quantity Allowed to Overrun" - Shall be set to the amount the box or container quantity is allowed to decrement past zero (0). This may be required for boxes or containers that have more components than the quantity specified by the supplier, such as a large box of screws that contains a few extra.

   For Example: For a box of screws that is specified to have a quantity of 5,000 in the JFK system, but may actually contain up to 5010 screws, the OverrunQuantity value should be set to 10.




### 2.2.11 Component(0) Decrement Request

1. "Decrement Lot Quantity" - Shall be enabled to decrease the box or container quantity by the "QuantityToDecrement" amount. A machine sequence contact shall be used to decrement when the lot component is consumed during the cycle. A lot lookup is performed immediately after the decrement to update all of the lot status bits.

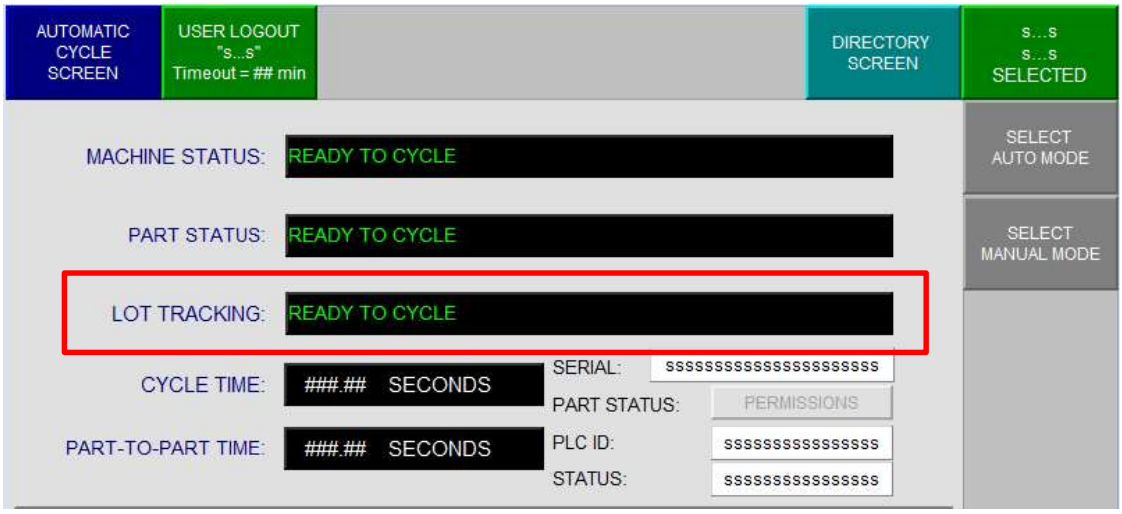

### 2.2.12 Component(0) Clear Data

1. "Clear Lot Data" - May be enabled to clear lot information for this component.

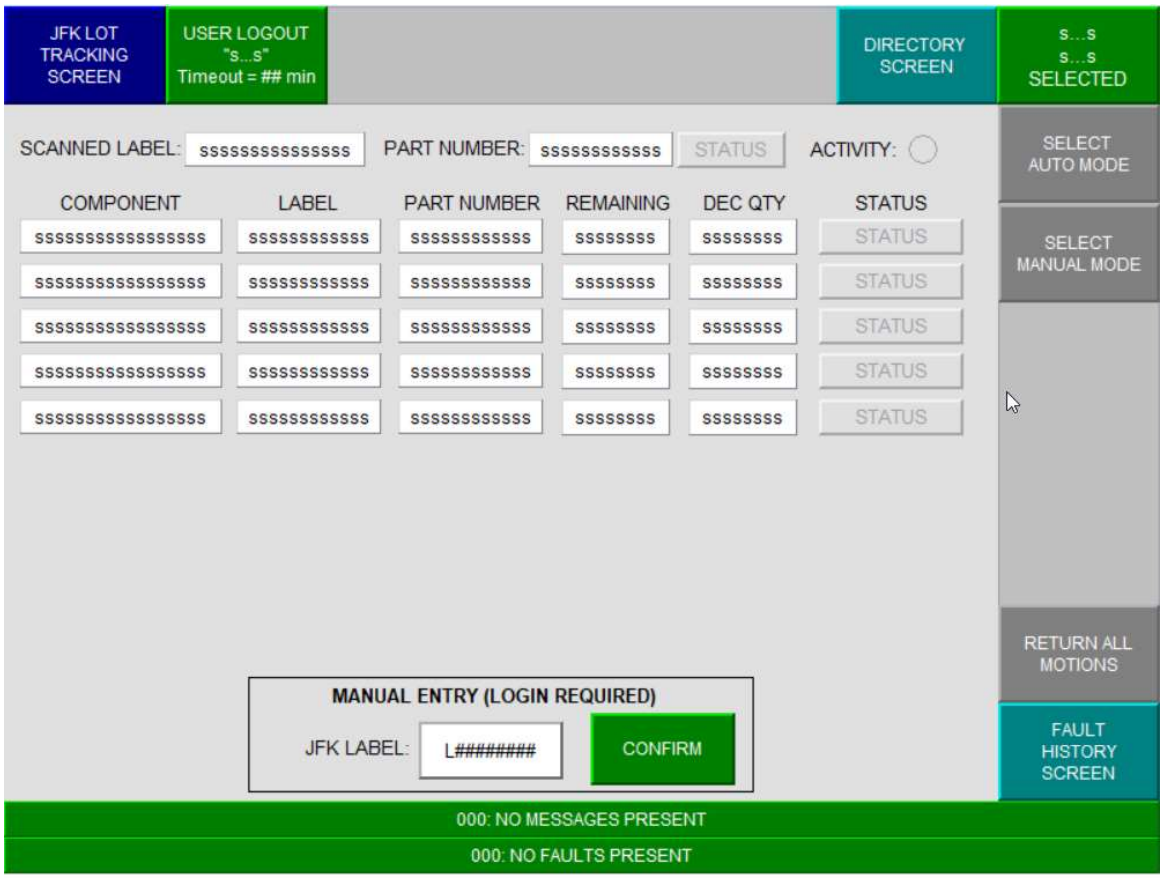
   For Example: A sensor may be used to detect that the box or container has been removed from the machine, clearing the data for the component, and forcing a scan to occur when a new box or container is placed at the machine.

## 2.3 HMI Status Display and Diagnostics

1. Automatic Screen: A multi-state indicator shall be configured in the Automatic Screen of the HMI application to display the lot tracking status to the operator.
   a. The routine used to interface with the lot tracking status display object is R09e_LotStatus . This routine shall be imported whenever a lot tracking routine is present in a program. All lot tracking status and message display control shall becontained in this routine.



2. Lot Tracking Screen: The Lot Tracking screen shall be added to the HMI application to display additional lot tracking information detail.



## 2.4 Traceability Application Status Display and Diagnostics:

Below is a screenshot of the Traceability Application status screen of the JFK Lot Tracking plugin with only 3 components configured in the PLC Logic.

*Components*

| | Name | Expected PNs | Label | Part Number | Remaining Qty | Decrement Qty | Low Limit | Overrun Qty | Status |
|---|---|---|---|---|---|---|---|---|---|
| 0 | Inner Tie Rod | 12341234 | L12121212 | 12341234 | 1000 | 1 | 0 | 0 | ✓ Lot OK |
| 1 | Mounting Stud | 23452345 | L34343434 | 23452345 | 450 | 1 | 0 | 0 | ✓ Lot OK |
| 2 | Washer | 34563456 | L56565656 | 34563456 | 600 | 1 | 0 | 0 | ✓ Lot OK |
| 3 | | | | | | | | | |
| 4 | | | | | | | | | |
| 5 | | | | | | | | | |
| 6 | | | | | | | | | |
| 7 | | | | | | | | | |
| 8 | | | | | | | | | |
| 9 | | | | | | | | | |

## RECORD OF REVISIONS

| Revision No | Date | Section | Description |
|---|---|---|---|
| 001 | 27AU21 | All | Original Approval & Issue Date |
| 002 | | | |
| 003 | | | |
| 004 | | | |
| 005 | | | |
| 006 | | | |
| 007 | | | |
| 008 | | | |
| 009 | | | |
| 010 | | | |
| 011 | | | |
| 012 | | | |
| 013 | | | |
| 014 | | | |
| 015 | | | |
| 016 | | | |
| 017 | | | |
| 018 | | | |
| 019 | | | |
| 020 | | | |