

SOLUTION DESIGN DOCUMENT

Project:

**Warehouse Management & Work In Progress
Solution**

Customer:

TPR AUTOPARTS INDIA PVT. LTD.

Submitted By:



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Document Revision History

REVISION NUMBER	DATE	PREPARED BY	COMMENT
1.00	April. 11, 2019	AMIT TOMAR	Original Document

Acronym

Customer: TPR AutoParts India Pvt. Ltd., hence forth will be referred as TPR.

Vendor: Sato Argox India Pvt. Ltd., hence forth will be referred as SATO.

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PROJECT SCOPE

The scope of the solution is to equip users with a WMS & WIP Solution which can print barcode label and manage WMS and WIP operation. This would require the development of the desktop application & device application. The document lays down the specifications of the middleware application, its architecture and infrastructure requirements.

The entire solution consists of followings:

- Front-End Application – Desktop Application
- Mobile Device Application

The solution will work on client server environment; the data will be stored at data server.

System Requirements

This section provides the necessary details about the hardware components required by the solution.

Desktop Computers

The desktop application would require the computer with following specifications:-

- Intel Core i3 or better CPU
- Operating system - Microsoft Windows 7(Service Pack 1)/10
- Hard Disk 40 GB or above
- Minimum 2 GB RAM
- Dot net Framework 4.0/4.5 Preinstalled
- USB Port



Development Tools

- Application User Interface: GUI C#.net 2015/2017
- Data Storage (DB): Sql Server

Introduction

The scope of this document is to provide the understanding of this solution to all members of TPR Team & SATO Team associated with the solution development & implementation.

This document major emphasize on solution processes & user operations, where the data will be captured and afterwards will be used.

This solution major comprises of followings:

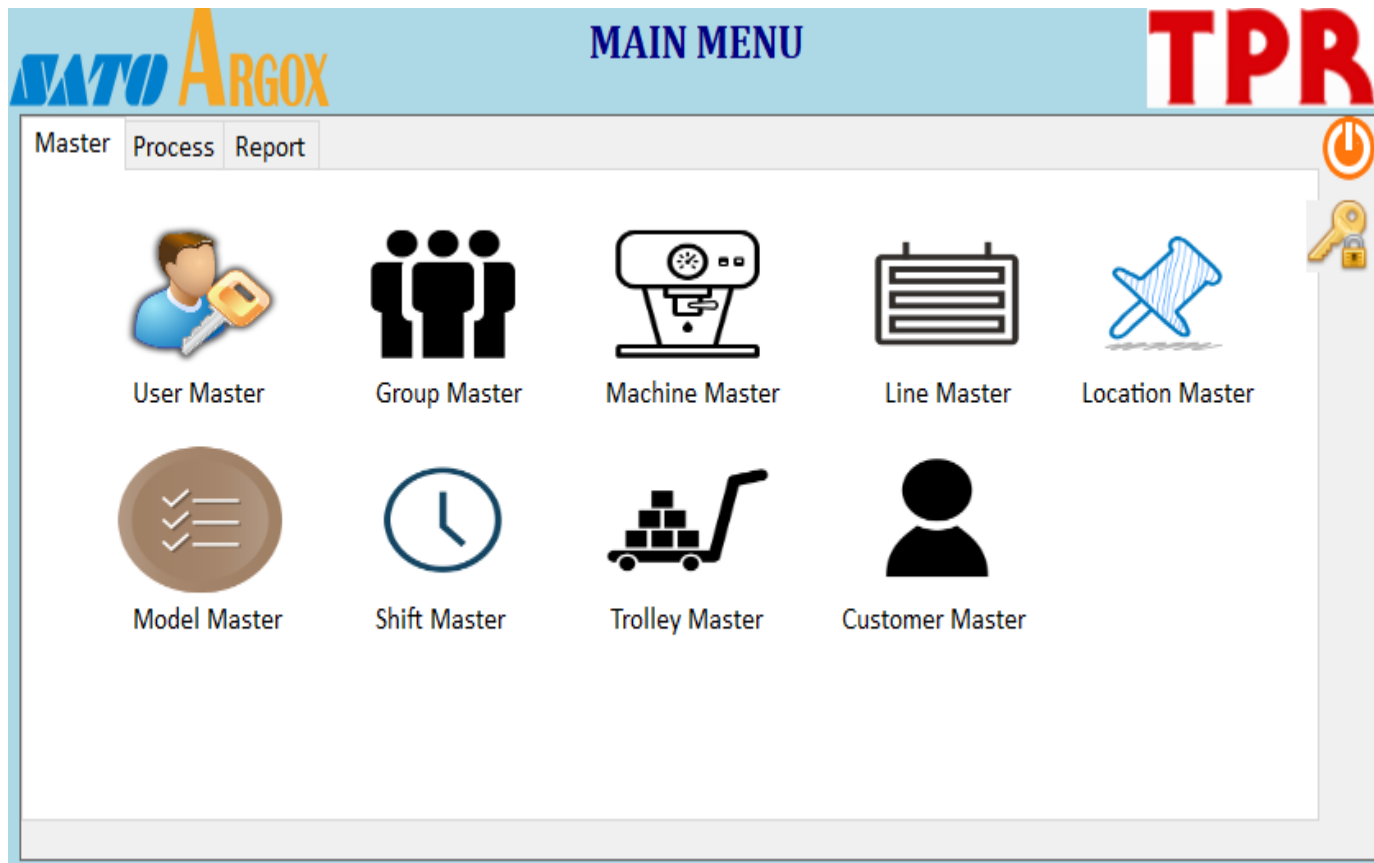
- Master Managements
- Different Types of Processes.

Login Screen

The login screen is a window titled 'TPR LOGIN' with a red 'X' button in the top right corner. It features a large illustration of two hands shaking, with the SATO ARGOX logo below it. To the right of the handshake is a user icon and a password icon, each followed by a text input field. A blue 'Login' button is positioned at the bottom right. The text 'App Version : 1.0.0.0' is displayed at the bottom left.

Brief Description: This screen is used for login purpose. User will enter User id & Password; system will validate entered user id & password. On the basis of entered user id & user rights assigned to user, menus of Main Menu screen will be enabled.

Main Menu



Brief Description: Main menu has three category.

Master – By clicking on relative master menu user can navigate to different screen, like as user will click on User Master it will take to user master screen.

Process – By clicking on relative process menu user can navigate to different process screen.

Report – By clicking on relative report menu user can navigate to different report screen.

Master Management

User Master

USER MASTER

User Id

Name


Password


Select Group

Rows Count : 0

	UserId	Name	Password	Group
*				


Save


Delete


Reset


Close

Brief Description: This screen is used to manage User via Save, Delete operations.

Note: UserId Will Be Unique.

Function Description in Detail:

Sr.No.	Function	Description	Remarks
1.	FORM LOAD	→During Form Load all data will be loaded in the Grid	
2.	SAVE	→User will enter all details and click on save button to save the data. →User will double click on any item in the grid to edit the data and click on save button to update the data.	
3.	Delete	→User will double click on any item in the grid to select the data and click on delete button to delete the data.	
4.	ReSet	→It will clear all fields.	

Group Master





GROUP MASTER

Group Name

Rows Count : 0

	Screen	Has Right
*		

	GroupName
*	

 Save
  Delete
  Reset
  Close

Brief Description: This screen is used to manage Group via Save, Delete operations.

Note: GroupName Will Be Unique.

Function Description in Detail:

Sr.No.	Function	Description	Remarks
1.	FORM LOAD	→During Form Load all data will be loaded in the Grid	
2.	SAVE	→User will enter group name and select all the screen for which group has right and click on save button to save the data. →User will double click on any item in the grid to edit the data and click on save button to update the data.	
3.	Delete	→User will double click on any item in the grid to select the data and click on delete button to delete the data.	
4.	ReSet	→It will clear all fields.	

Machine Master






MACHINE MASTER

Machine No.

Desc

Rows Count : 0

*	Machine No	Desc
*		

 Save
 Print
 Delete
 Reset
 Close

Brief Description: This screen is used to manage Machine via Save, Delete operations.

Note: MachineNo Will Be Unique.

Function Description in Detail:

Sr.No.	Function	Description	Remarks
1.	FORM LOAD	→During Form Load all data will be loaded in the Grid	
2.	SAVE	→User will enter all details and click on save button to save the data. →User will double click on any item in the grid to edit the data and click on save button to update the data.	
3.	Delete	→User will double click on any item in the grid to select the data and click on delete button to delete the data.	
4.	ReSet	→It will clear all fields.	

Line Master


LINE MASTER


Line No.


Line Desc.


Rows Count : 0

Line No	Desc
*	


Save


Delete


Reset


Close

Brief Description: This screen is used to manage Line via Save, Delete operations.

Note: LineNo Will Be Unique.

Function Description in Detail:

Sr.No.	Function	Description	Remarks
1.	FORM LOAD	→During Form Load all data will be loaded in the Grid	
2.	SAVE	→User will enter all details and click on save button to save the data. →User will double click on any item in the grid to edit the data and click on save button to update the data.	
3.	Delete	→User will double click on any item in the grid to select the data and click on delete button to delete the data.	
4.	ReSet	→It will clear all fields.	

Customer Master


CUSTOMER MASTER


Customer Name


Address


Rows Count : 0

	CustomerName	Address
*		


Save


Delete


Reset


Close

Brief Description: This screen is used to manage Customer via Save, Delete operations.

Note: Customer Name Will Be Unique.

Function Description in Detail:

Sr.No.	Function	Description	Remarks
1.	FORM LOAD	→During Form Load all data will be loaded in the Grid	
2.	SAVE	→User will enter all details and click on save button to save the data. →User will double click on any item in the grid to edit the data and click on save button to update the data.	
3.	Delete	→User will double click on any item in the grid to select the data and click on delete button to delete the data.	
4.	ReSet	→It will clear all fields.	

Model Master


MODEL MASTER


Model No.


Desc


Rows Count : 0

ModelNo	Desc
*	


Save


Delete


Reset


Close

Brief Description: This screen is used to manage Model via Save, Delete operations.

Note: ModelNo Will Be Unique.

Function Description in Detail:

Sr.No.	Function	Description	Remarks
1.	FORM LOAD	→During Form Load all data will be loaded in the Grid	
2.	SAVE	→User will enter all details and click on save button to save the data. →User will double click on any item in the grid to edit the data and click on save button to update the data.	
3.	Delete	→User will double click on any item in the grid to select the data and click on delete button to delete the data.	
4.	ReSet	→It will clear all fields.	

Shift Master

SHIFT MASTER


Shift Name


Start Time


End Time


Rows Count : 0

*	Shift	StartTime	EndTime


Save


Delete


Reset


Close

Brief Description: This screen is used to manage Shift via Save, Delete operations.

Note: ShiftName and Time Will Be Unique.

Function Description in Detail:

Sr.No.	Function	Description	Remarks
1.	FORM LOAD	→During Form Load all data will be loaded in the Grid	
2.	SAVE	→User will enter all details and click on save button to save the data. →User will double click on any item in the grid to edit the data and click on save button to update the data.	
3.	Delete	→User will double click on any item in the grid to select the data and click on delete button to delete the data.	
4.	ReSet	→It will clear all fields.	

Trolley Master

TROLLEY MASTER

Trolley No.


Desc

Pack Size

Rows Count : 0

	Trolley No	Desc	PackSize
*			


Save


Print


Delete


Reset


Close

Brief Description: This screen is used to manage Trolley via Save, Delete operations.

Note: TrolleyNo and Time Will Be Unique.

Function Description in Detail:

Sr.No.	Function	Description	Remarks
1.	FORM LOAD	→During Form Load all data will be loaded in the Grid	
2.	SAVE	→User will enter all details and click on save button to save the data. →User will double click on any item in the grid to edit the data and click on save button to update the data.	
3.	Print	→User will double click on any item in the grid to select the data and click on print button to print the barcode for trolley.	
4.	Delete	→User will double click on any item in the grid to select the data and click on delete button to delete the data.	
5.	ReSet	→It will clear all fields.	

Process

Production Plan

PRODUCTION PLAN - CUTTING

Select Month

Production Order No.

Select Model

Qty

Rows Count : 0

	Month	ProdOrderNo	Model	Qty
*				

Save
 Delete
 Reset
 Close

Brief Description: This screen is used to manage Production Plan via Save, Delete operations.

Note: Month, Production Order No and Model combination Will Be Unique.

Function Description in Detail:


Sr.No.	Function	Description	Remarks
1.	FORM LOAD	→During Form Load all data will be loaded in the Grid	
2.	SAVE	→User will enter all details and click on save button to save the data. →User will double click on any item in the grid to edit the data and click on save button to update the data.	
3.	Delete	→User will double click on any item in the grid to select the data and click on delete button to delete the data.	
4.	ReSet	→It will clear all fields.	

Cutting


CUTTING - SHIFT A

Select Model <input style="width: 100%;" type="text"/>	Select Operator <input style="width: 100%;" type="text"/>	
Select Trolley <input style="width: 100%;" type="text"/>	Lot No <input style="width: 100%;" type="text"/>	
Total Qty <input style="width: 100%;" type="text"/>	OK Qty <input style="width: 100%;" type="text"/>	
Mixed Trolley <input type="checkbox"/>	Serial No <input style="width: 100%; background-color: yellow;" type="text"/>	


PP Qty	Pending Qty	NG Qty
100	100	0



Next



Reset



Close


Brief Description: Cutting screen will show shift automatically from system current time.

- Based on current month model will be selected auto as defined in production plan.
- Based on selected model production plan qty and pending qty will come automatically.
- User Will select operator.
- User will enter Lot No.
- User will enter the total qty.
- User will enter OK Qty. Based on total Qty and OK qty, NG qty will be calculated automatically.
- Serial no will be autogenerated.
- If trolley is mixed, means more than 1 lot will be in same trolley(maximum 2 allowed), then user will select the Mixed Trolley. For 1 lot in 1 trolley Mixed Trolley will not be selected.
- User will click on Next button. If NG Qty = 0 then it will print trolley card but if NG Qty > 0 then User has to input defect parameter
- Defect qty should match the NG qty

CUTTING - MATERIAL DEFECT									
Input Details									
Inner Cavity	<input type="text" value="0"/>	Outer Cavity	<input type="text" value="0"/>	Penetration Porosity	<input type="text" value="0"/>				
Slag	<input type="text" value="0"/>	Dent	<input type="text" value="0"/>	Spine	<input type="text" value="0"/>				
Foreign Substance	<input type="text" value="0"/>	Crack	<input type="text" value="0"/>	Material LD	<input type="text" value="0"/>				
OD	<input type="text" value="0"/>	Cutting	<input type="text" value="0"/>	Other	<input type="text" value="0"/>				
	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>				
<div>Save Reset Close</div>									

Following trolley card will be printed.

Model No:	XZ90
Lot No:	07091810703
Qty:	16

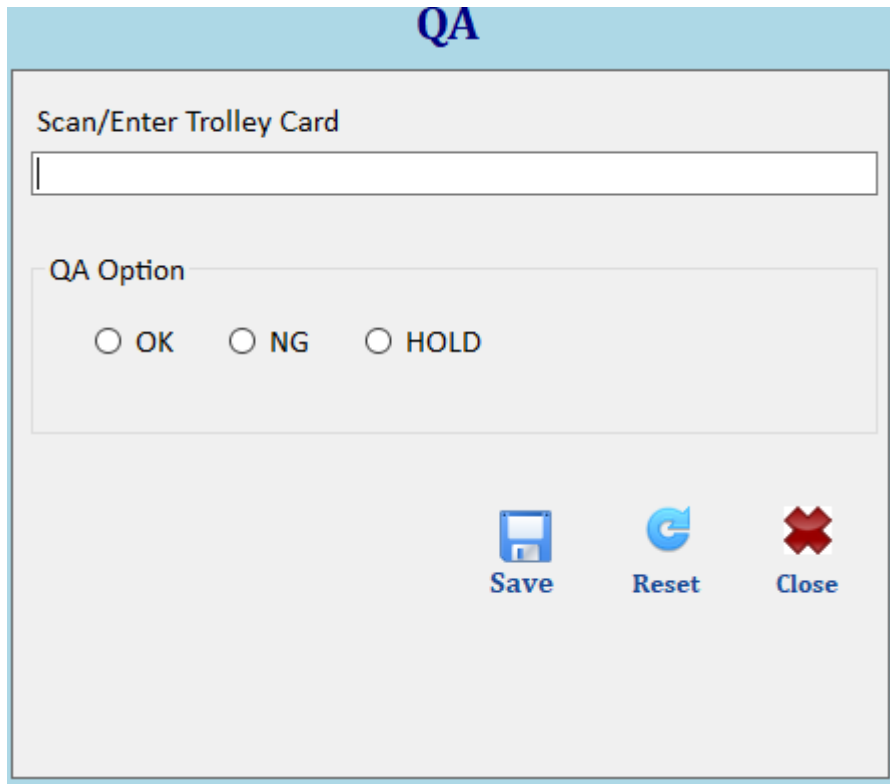

T01-07091810703

In case of mixed Trolley, When user will click on save button first it will save data then again after inputting the other lot no user will click on next button then same barcode will come but barcode will have following value.

T01-07091810703-0704

Note: Trolley Card Will Be Unique. Leader will come automatically based on login details.

QA



The image shows a software interface for Quality Assurance (QA). At the top, the title 'QA' is displayed in a large, bold, blue font. Below the title, there is a section labeled 'Scan/Enter Trolley Card' with a text input field. Underneath this, there is a section labeled 'QA Option' containing three radio button options: 'OK', 'NG', and 'HOLD'. At the bottom of the interface, there are three buttons: 'Save' (with a floppy disk icon), 'Reset' (with a circular arrow icon), and 'Close' (with a red 'X' icon).

Brief Description: This screen will be used for QA. User will enter trolley card barcode then select the desired option.

OK -> Complete Trolley will be made as OK

NG -> Complete Trolley will be made as NG. Further it can not be used for any process.




HOLD -> Complete Trolley will be made as HOLD. It can not be used for any process until user mark it as OK. Same screen will be used for UNHOLD trolley.

Note:- If user select wrong OK/NG/HOLD option then it can be changed from QA report which will be provided later.

QASample

QA Sampling

Scan/Enter Trolley Card	<input type="text"/>
Total Qty	<input type="text"/>
Picked Qty	<input type="text"/>

 Save  Reset  Close

Brief Description: If user want to use more qty for QA then user will enter trolley card barcode then it will show the total qty automatically, user will input the picked qty and can perform QA operation.

Login(HHT)

TPR



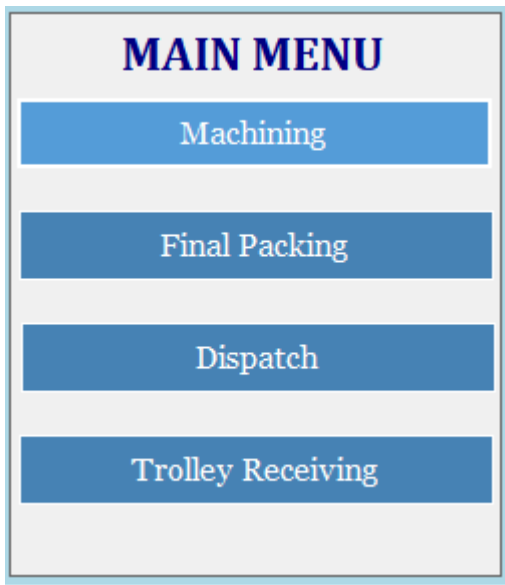


Login


App Version : 1.0.0.0

Brief Description: This screen will be used to login in HHT, based on user rights menu will be enable/disable for the user.

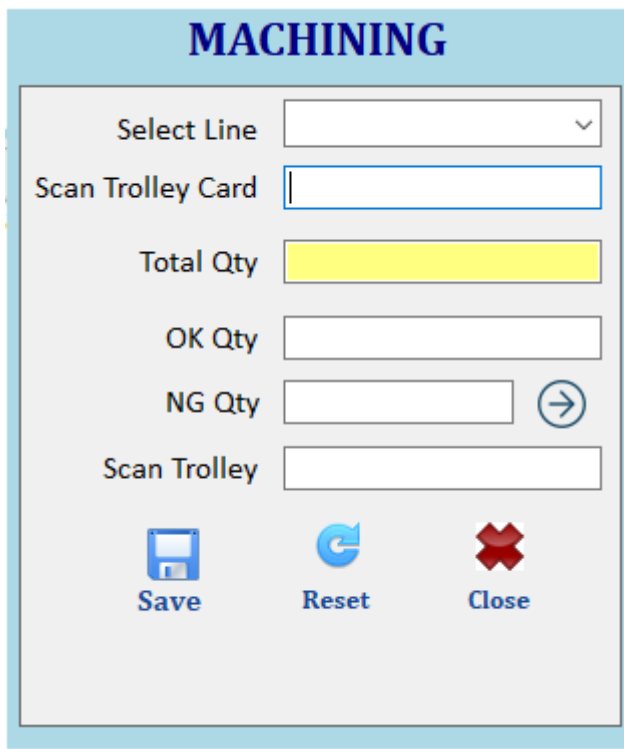
Main Menu(HHT)



The Main Menu(HHT) screen displays a vertical list of four blue buttons with white text, set against a light gray background. The buttons are labeled 'Machining', 'Final Packing', 'Dispatch', and 'Trolley Receiving' from top to bottom.

Brief Description: This screen will be used to select different operations in the HHT.

Machining(HHT)



The Machining(HHT) screen features a light blue header with the title 'MACHINING'. Below the header, there are several input fields and buttons. The 'Select Line' field is a dropdown menu. The 'Scan Trolley Card' field is a text input. The 'Total Qty' field is a yellow text input. The 'OK Qty' field is a white text input. The 'NG Qty' field is a white text input with a blue arrow icon to its right. The 'Scan Trolley' field is a white text input. At the bottom, there are three buttons: 'Save' with a blue floppy disk icon, 'Reset' with a blue circular arrow icon, and 'Close' with a red 'X' icon.




Brief Description: User Will select Line No And Scan the trolley card which will show total qty automatically then user will input ok qty and ng qty if ng qty is greater than 0 then user will click ON



button to input defect

MATERIAL DEFECT

IC	<input type="text" value="0"/>	OC	<input type="text" value="0"/>
Slag	<input type="text" value="0"/>	Dent	<input type="text" value="0"/>
Spine	<input type="text" value="0"/>	M/C Ng	<input type="text" value="0"/>
Others	<input type="text" value="0"/>		<input type="text" value="0"/>
	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
	<input type="text" value="0"/>		





 Save  Reset  Close

Then user will scan new trolley and click on save button. If qty validate successfully then new trolley card will print.

Note:- FIFO will be maintained during machining process based on Cutting date.

Final Packing(HHT)

FINAL PACKING




Customer Trolley	<input type="text" value="0"/>	
Scan Trolley Card	<input type="text"/>	
Total Qty	<input type="text"/>	
Input OK Qty	<input type="text"/>	
Input NG Qty	<input type="text"/> 	
Pack Size	<input type="text"/>	
		
Save	Reset	Close

Brief Description: User Will select customer trolley, if there is any qty in the trolley already then application will show the qty automatically.

User will scan the trolley card which will show the total qty and pack size of customer trolley.

User will input ok qty, Ng Qty. If Ng Qty > 0 then user has to input defect qty.

MATERIAL DEFECT

IC	<input type="text"/>	OC	<input type="text" value="0"/>
Slag	<input type="text" value="0"/>	Dent	<input type="text" value="0"/>
Spine	<input type="text" value="0"/>	M/C Ng	<input type="text" value="0"/>
Others	<input type="text" value="0"/>		<input type="text" value="0"/>
	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
	<input type="text" value="0"/>		
			
Save	Reset	Close	

When user will click on save button if qty is completed then it will generate trolley card.

Dispatch Order

DISPATCH ORDER

Date




Select Model

Select Customer

Input Qty

Rows Count : 0

	Date	Model	Customer	Qty
*				

 Save
  Delete
  Reset
  Close

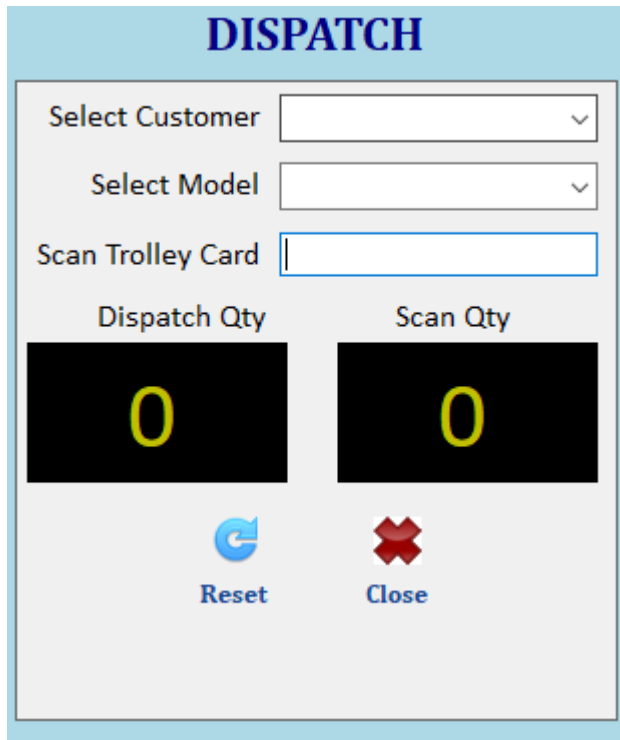
Brief Description: This screen is used to manage Dispatch Order via Save, Delete operations.

Note: Date, Model and customer combination Will Be Unique.

Function Description in Detail:

Sr.No.	Function	Description	Remarks
1.	FORM LOAD	→During Form Load all data will be loaded in the Grid	
2.	SAVE	→User will enter all details and click on save button to save the data. →User will double click on any item in the grid to edit the data and click on save button to update the data.	
3.	Delete	→User will double click on any item in the grid to select the data and click on delete button to delete the data.	
4.	ReSet	→It will clear all fields.	

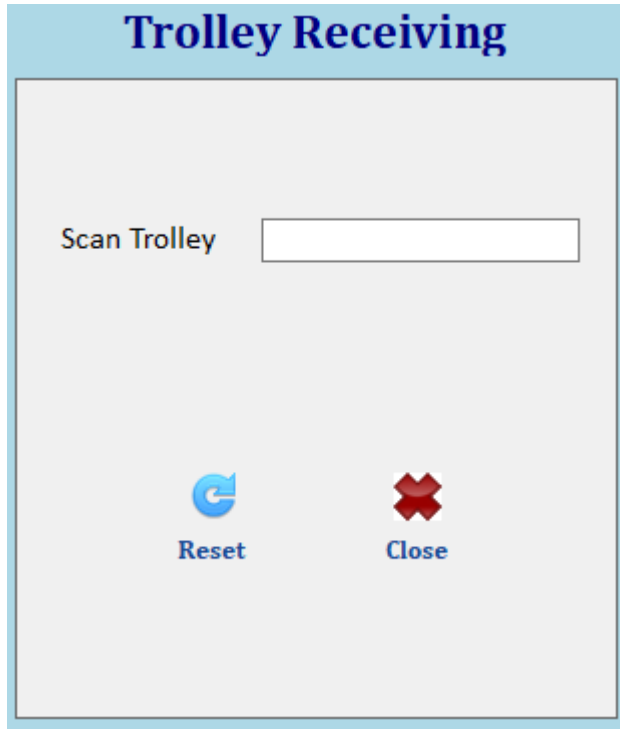
Dispatch(HHT)



The screenshot shows a software interface titled "DISPATCH" in a blue header. Below the header, there are three input fields: "Select Customer" and "Select Model" are dropdown menus, and "Scan Trolley Card" is a text input field. Below these fields, there are two large black boxes with yellow numbers "0", labeled "Dispatch Qty" and "Scan Qty" respectively. At the bottom of the interface, there are two buttons: "Reset" with a blue circular arrow icon and "Close" with a red X icon.

Brief Description: User will select the customer and model which will show the today's dispatch qty that need to be dispatched then user will scan trolley card and it will increase the scan qty. When Dispatch qty and scan qty will be same then application will show message dispatch complete

Trolley Receiving(HHT)



The image shows a software interface titled "Trolley Receiving" in a blue header. Below the header is a light gray rectangular area. Inside this area, on the left, is the text "Scan Trolley". To its right is a white rectangular input field. At the bottom of the gray area, there are two buttons: a blue circular button with a white circular arrow icon labeled "Reset", and a red square button with a white 'X' icon labeled "Close".

Brief Description: When the trolley will come back from customer then user will scan the trolley barcode to confirm trolley receiving.

NOTE:

- Screen design may change, above are reference screens.
- In HHT for every error there will sound and vibration.