RFID Library Solutions

EZ Sort AMH

Admin Manual

Automated Material Handling System – V7.0

TABLE OF CONTENTS

1.0 GENERAL INFORMATION

1.1 SYSTEM OVERVIEW

The RFID Library Solutions Automated Material Handling system has been designed and built to provide:

- Automated library item/material transportation and sorting.
- The ability for library patrons to return multiple items at a single time to the system.
- The ability to check-in returned items effectively and reliably.
- The ability to modify the sorting parameters used by the system easily and quickly.
- The ability to confirm, track & report item check-in at multiple locations on the system.
- The ability to communicate with the libraries ILS via the SIP(2) protocol.
- The ability to maintain a system event log, via dedicated database, providing system usage data:
  - *Item events:* Library items trigger database events whenever they pass RFID antennae, effectively mapping the path of the item through the system.
  - *System events:* System messaging, such as SIP communications are logged as they occur, providing system usage information.
  - *System Alerts:* Vital system alarms, such as sort sensor stoppage, RFID reader failure, *or ILS* communication loss are logged as they occur to track system trends.
- The ability to monitor system status via PC based graphical user interface:
  - Current number of items in each sort location
  - Status of system sensors
  - Status of conveyors, sorters, book drops, induction systems, RFID readers, and more.

1.2 AUTHORIZED USE PERMISSION

Approved Usage

RFID Library Solutions authorizes the 'Library' to utilize its EZ Sort Software and PLC Logic program to control the AMH/Sorting System hardware as well as communicate with the ILS to check-in returned material. This resource, including its graphical interface, user screens, CPU configurations, system data, return statistics and other details related to the AMH system, is provided for authorized Library use only.

By using this system, you represent that you are an authorized user and agree to protect, use safely, follow user instructions and perform regular system cleaning as described in this manual.

System Monitoring

RFID Library Solutions does not regularly monitor or re-mote into your AMH system. However, we do ask that we are allowed some form of remote access to the controller CPU (AMH Staff Station CPU). Our preferred remote partner is 'Logmein.com'. A technician will install the application on the CPU, add the profile to our account and only RFID LS Technicians will have the password to access the AMH computer. We will only log in to your system if there is an Alarm or assistance is requested by library staff. If on the other hand, Logmein.com is not permissible, we can and have used other remote options or solutions. System monitoring is essential to consistent operation.

Consent & Liability

Use of an RFID Library Solutions AMH System constitutes consent to this policy and the user guidelines set forth in this manual. Any unauthorized use of the system may result in loss of warranty or surrender of the service contract.

1.3 OPERATOR & SYSTEM SAFETY

Working with or operating around Automated Material Handling equipment can be harmful if safety guidelines are not followed. Remain aware of hazards that apply to the system at ALL times. Use these warnings to help identify hazards. RFID Library Solutions strongly advises users to fully, read and understand the safety guidelines for use with the AMH System. Failure to heed warnings and follow procedures may result in operator injury.

In no event will RFID Library Solutions, Inc. be responsible or liable for individuals and property damaged because of the miss-use of or failure to follow safety instructions provided below. Common sense and a thorough knowledge of the system capabilities are required for a safe approach to system operation.

WARNING GUIDELINES

AUTOMATION / MOVING PARTS - When operating the AMH System, since it is an automated machine, do not attempt to remove anything from the system while it is running. That includes jammed material, non-library items, or loose miscellaneous paper/debris from moving conveyors and induction modules. If the circumstances require a system stoppage, please follow one of the steps below: *Always think safety first!*

- ✓ *Press a red Emergency Stop (E-Stop) button to immediately cut power to the system and stop movement. Then clear or remove the object.*
- ✓ *If the situation is not threatening, wait for the system to 'Alarm' out and pause automatically. The AMH is designed to stop after an alert is triggered.*
- ✓ *The remaining option is to use the EZ Sort software to stop the system using the yellow AUTO/MANUAL & START/PAUSE buttons. Simply place it into MANUAL & PAUSE modes.*

CONTROL PANELS - Do not enter any of the control panels associated with the AMH system. Dangerous levels of voltage are present in many of the enclosures and could cause harm to anyone touching an unfamiliar component inside. Besides human injury, incorrect handling may cause damage to critical equipment. ONLY open a control panel door under the direction of an RFID LS Technician. In these instances, it is simply to observe the status of key components and report the findings to the technician.

MACHINE SAFETY - Do not under any circumstances, hard shut down the AMH staff station CPU or turn the control panel disconnect handle to 'OFF' while the system is running. Pressing the CPU 'ON/OFF' button without shutting it down properly can and has caused system computers irreparable damage. As has powering down the AMH using the main disconnect switch. NEVER shut the system down fully unless under the direction of an RFID LS Technician.

INDUCTION MODULES – While they are both effective automation tools, precautions and user awareness must present when operating each device. Powerful pinch points and moving parts are elements necessary to their functionality. Below is a short reminder list for each module.

Bin Induction:
This module utilizes special bins to collect material from book returns and a tilting mechanism to unload the bin's contents onto an in-feed conveyor. Key safety considerations are:

- ✓ *When a bin is not present over the tilting device, stay out of and keep all body parts from entering the safety cage for the module. Moving parts and a power pinch point is present within the no entry zone.*
- ✓ *Keeps hands, body parts and other objects away from induction module after the green START*

button has been pressed. The tilting device has an automated cycle that it runs through for the operator. Wait to touch anything until the timer has expired and the bin tilts back to the down position in the safety cage.

- ✓ *Do not touch or adjust the air compressor settings associated with the module. The air pressure is set and designed to function at low PSI levels. That range is between 18 – 20 PSI. Anything higher may cause damage to the bins.*

Tote Induction:

This module utilizes a lift stick with forks to carry and haul transportation totes in the workroom. It also loads them one at a time onto a tilting mechanism to unload their contents onto a conveyor. Key safety considerations are:

- ✓ *The office lift stick is only rated to pick-up and move around 3 transport totes at one time. Any addition weight over a long period of time will deteriorate its batteries. The lift chain may also break because of the excess weight.*
- ✓ *When using the lift stick to load a single tote onto the tilting mechanism, use caution while placing the tote into the correct position. Tote and fork must be inside the black vertical support framework of the tilter. Pull the tilter away slowly, making sure that the tote's full weight is on the frame.*
- ✓ *Before starting the tote induction cycle, make sure that both bungee strap hooks are secured to the tote side wall. The straps hold the tote securely to the tilting frame when fully angled forward. They help ensure the tote does not travel down the conveyor to damage equipment.*
- ✓ *Keeps hands, body parts and other objects away from induction module after the green START button has been pressed. The tilting device has an automated cycle that it runs through for the operator. Wait to touch anything until the timer has expired and the tilter returns to the down position.*

ELECTRICAL OUTLETS - Do not under any circumstances, play with, add or remove electrical power cords from outlets installed on the AMH System. They are installed for specific uses and have different current and voltage ratings than many day-to-day power-hungry devices, like phones, laptops, vacuums or power tools. Plugging in such appliances and pop a circuit breaker in the control panel and cause internal damage. This is a particularly important reminder to cleaning staff during on-library hours. Ask permission before plugging or unplugging anything.

MOTOR REMINDER - Motors are a constant and continuously operating component of the AMH system. As a result, they tend to generate minor amounts of heat. This safety reminder is more for staff awareness than anything else. Motors do not get hot enough to burn skin, but do get warm to the touch. So as not to surprise anyone, be aware of this fact. Staff should avoid their contact not only for the warmth, but their size and weight. They hurt when unexpectedly hit by an arm, shoulder or head. Always be aware of your movements around the system.

CLOTHING - For those library staff that work directly with the AMH system, loose clothing and hanging articles like necklaces, hair, jewelry or name badges can be hazardous. They can become entangled with a conveyor or moving part on the system. Please avoid wearing such loosely hanging items while in contact with the sorter.

MISC. SYSTEM WARNINGS - The following list includes some common machine hazard warnings. This list is not all-inclusive. Please follow all posted caution & warning notices when operating your system.

- ✓ *Do not modify, change or manipulate any components on the AMH System. RFID LS is not responsible for the safety or performance of the system if unauthorized changes are*

made. Unauthorized service voids the warranty. Contact your RFID LS technician before altering your system

- ✓ *Do not operate the system without proper training.*
- ✓ *Do not perform any maintenance requiring access to protected areas.*
- ✓ *The AMH staff station CPU is intended only for the purpose of operating and controlling the sorter system. Other intended uses may affect performance or operational ability.*
- ✓ *Do not run virus scan software while the sorter is running, execute scans only when the EZ Sort software is off.*
- ✓ *Control Microsoft Windows® automatic updates. Your RFID LS technician will update the operating system during a schedule PM visit.*
- ✓ *Do not wear loose clothing, scarves, neckties or hanging sleeves. Protect long hair from similar entanglements.*
- ✓ *Avoid pinch points on the system. Particularly, induction modules and transitions from conveyor to conveyor.*
- ✓ *Never stand, walk or sit on a conveyor.*
- ✓ *Always assume the system can start without warning.*
- ✓ *Report and log all strange noises, loose parts or excessive wear.*
- ✓ *Do not eat or drink near the Sorting system. Avoid liquid spills near all electrical equipment.*
- ✓ *Never operate the system while impaired. Such conditions include:*
  - *Improper training*
  - *Fatigue, sick or drowsy*
  - *Inattentive behavior, carelessness or confusion*
  - *Chemically influenced or altered states*
  - *Emotionally distressed*
  - *Avoid distractions from outside influences, like cell phones, TV or conversation*
- ✓ *Use a special 'grabbing tool' when clearing a jam or removing an unwanted object from a conveyor.*
- ✓ *Watch for hazardous warning signs that identify different warnings around the AMH system. They include those shown below:*

Electrical Shock

Entanglement

General Warning

Pinch Point

1.4 POINTS OF CONTACT

For more information, please contact us at:

RFID Library Solutions
11030 98th Ave NW
Maple Grove, Minnesota 55369
Office: (763) 476-4643
Toll Free: (877) 924-7434
email: info@rfidls.com
www.rfidls.com

1.5 HELP DESK

Please call (877) 924-7434, or email service@rfidls.com for assistance.

****NOTE**: A common location to find RFID LS Technician contact information can be found at the AMH staff station CPU. The technician's business card with phone numbers or email address should be taped to or around the workstation.

1.6 ORGANIZATION OF MANUAL

This manual is broken up into the following sections:

Section 1. General Information - Covers general information about RFID Library Solutions and the Sorting machine.

Section 2. System Summary - Details specific system components.

Section 3. Getting Started - Describes the various menus and screens used while operating the system.

Section 4. Using The System - Outlines system operating procedures.

Section 5. Configuring the System - Explains system configuration procedures.

Section 6. Troubleshooting - Common alerts on the system and how to resolve them.

Section 7. Maintenance - Lists system maintenance procedures.

1.7 ACRONYMS & ABBREVIATIONS

AMH	*Automated Material Handling*	*The RFID LS EZ sort machine is commonly referred to as an AMH system*
ILS	*Integrated Library System*	*The ILS is a system used to maintain the item and patron information for the library.*
SIP	*Standard Interchange Protocol.*	*This is the messaging protocol used by the RFIDLS EZ Sort machine to communicate with the library's ILS.*
PLC	*Programmable Logic Controller.*	*This industrial controller is used to operate the mechanical devices on the RFIDLS EZ Sort machine. All sensors, motors, indicators, buttons, etc. are connected to the PLC.*

1.8 EZ SORT & AMH NOMENCLATURE

- Manual Mode
- Auto Mode
- Run Mode
- Pause Mode
- Item/Material
- Selection/ Sort Rule
- Item Process
- Alarm
- Channel = Antenna
- Item Tester
- Sort Groups
- Sip Message Field
- Sort Rule Parameter
- E-Stop Button
- Ethernet Connection
- Separation Conveyors
- Control Enclosure(S)
- Status/Control Column
- Check-In Date Modification
- Sort Bin
- Induction Bin
- RFID Reader
- Tote Induction
- Bin Induction
- Conveyor Sensor
- Sort Sensor
- Alert
- ILS Service
- PLC Service
- Item Intake Service
- Sort Scheme
- Exception Item
- Sip Format
- Sip Message
- Sort Conveyor
- Conveyor Transition
- Arb Roller Belt
- Sort Chute
- Sort Zone Actuator
- Belt Flight (Paddle)
- Power Disconnect Handle

1.9 AMH HARDWARE LEGEND & MAP

2.0 SYSTEM SUMMARY

This section provides a general overview of the system written in non-technical terminology.

2.1 HARDWARE CONFIGURATION

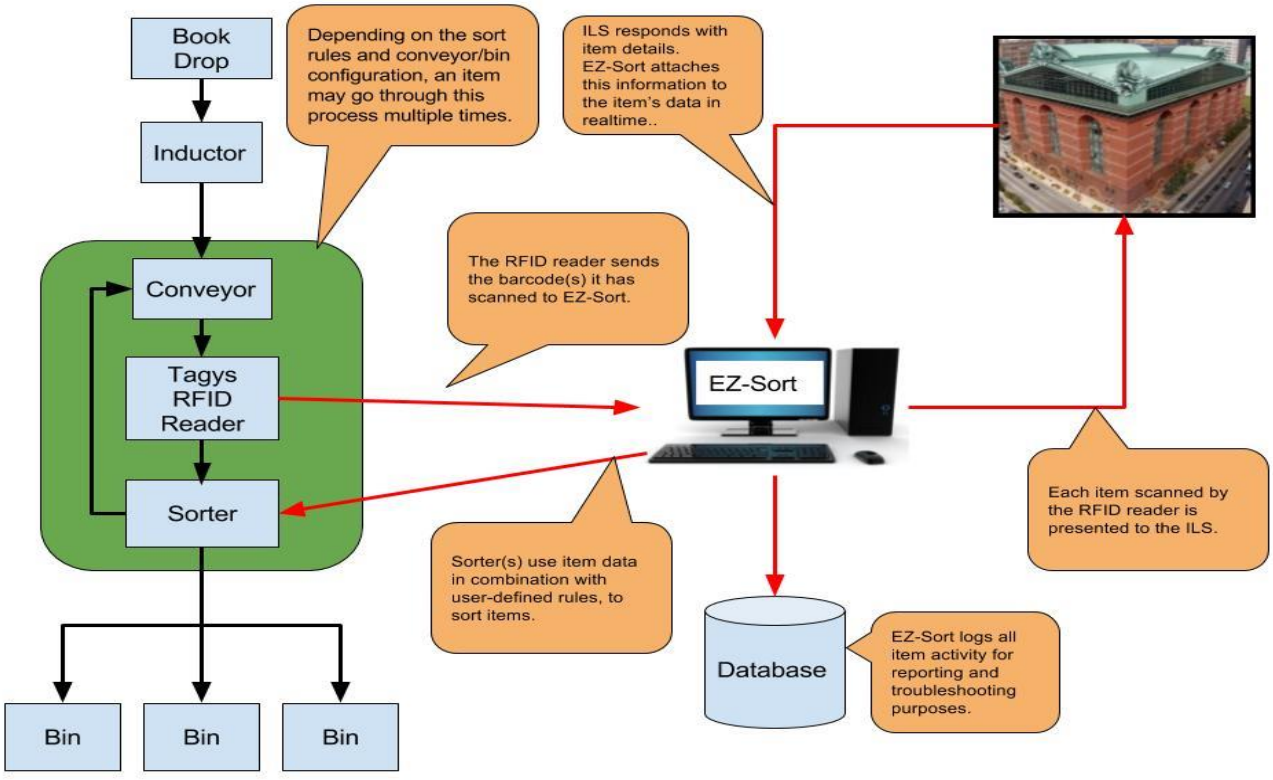
Each RFIDLS AMH System is custom designed to meet the physical lay-out and circulation requirements of Library it is installed. Regardless, systems typically include some combination of the hardware listed below. Conveyors are utilized to accept, transport and sort returned material from either patrons or staff. The RFID equipment collects item barcodes for check-in to the library ILS. The PLC and CPU elements provide a means to control the system hardware as well as communicate data back & forth with the ILS. Induction modules are optional tools that automate the input of material onto the conveyors by staff.

The RFIDLS EZ Sort machine is made up of the following components: The image on page 5, titled 'AMH Hardware Legend & Map', illustrates nicely how systems are presented in a workroom.

1. Plastic Transportation & Separation Conveyor(s)
2. Scalable Sorting Conveyor(s)
3. Industrial RFID Reader(s) & Antenna(s)
4. Programmable Logic Computer (PLC) - Hardware Control
5. PC & EZ Sort Software User Interface
6. Induction Modules (Tote or Bin)

2.2 EZ SORT SOFTWARE DATA FLOW

The following chart diagrams how the EZ Sort Software receives item ID's and processes them through to acquire item specific data from the library database (ILS) to use for sorting on the AMH System.



3.0 GETTING STARTED

This section shows how to open/close the EZ Sort software as well as utilize administrative settings.

3.1 STARTING THE SOFTWARE

Starting at the CPU desktop, locate and double click on the 'RFIDLS EZ Sort' icon. An image of the icon is depicted below.

The EZ Sort software might take a minute to load and fully open for use on the monitor. Numerous program threads are beginning to communicate with system hardware as well as initiating ILS communication and the PLC service.

3.2 'EZ SORT' MAIN USER INTERFACE

The user interface depicted on the next page is a common illustration of what the EZ Sort Software's main control screen looks like. A right vertical column is dedicated to real-time status indicators; such as PLC connection, ILS connection, Item Intake Service (RFID Readers), a User Mode state, and the active Sort Scheme. A new addition to the main page is real-time system 'Alerts' and 'Alarms'. Not only can they be viewed, but cleared with quicker access to the restart buttons. In fact, all internal (software) and external (hardware) issues will be logged to a database for more in-depth item review and system tracking. The Status Column also maintains some familiar buttons. The yellow AUTO/MANUAL & START/PAUSE controls remain in a similar functional roll as well as position. In addition, the option to add 'Back Dating' or 'Freeze' the check-in date continues to be available.

The main body of the main user interface displays the graphical representation of the AMH. The symbols shown each represent a key piece of hardware on the AMH system. They are positioned on the screen to mimic the physical layout in the workroom, although scaling may be slightly modified to fit the computer screen. Green rectangles are conveyors. Yellow boxes represent RFID antennas and a reader. Purple squares with flashing lights are the sort zones. Smaller light blue squares denote book returns. Induction modules are shown as individual purplish squares. Each of the component symbols is given a descriptive label for recognition. Finally, Item Information bars can be displayed or hidden as needed, in order to view the color-coded status of an item as it is scanned by an RFID antenna.

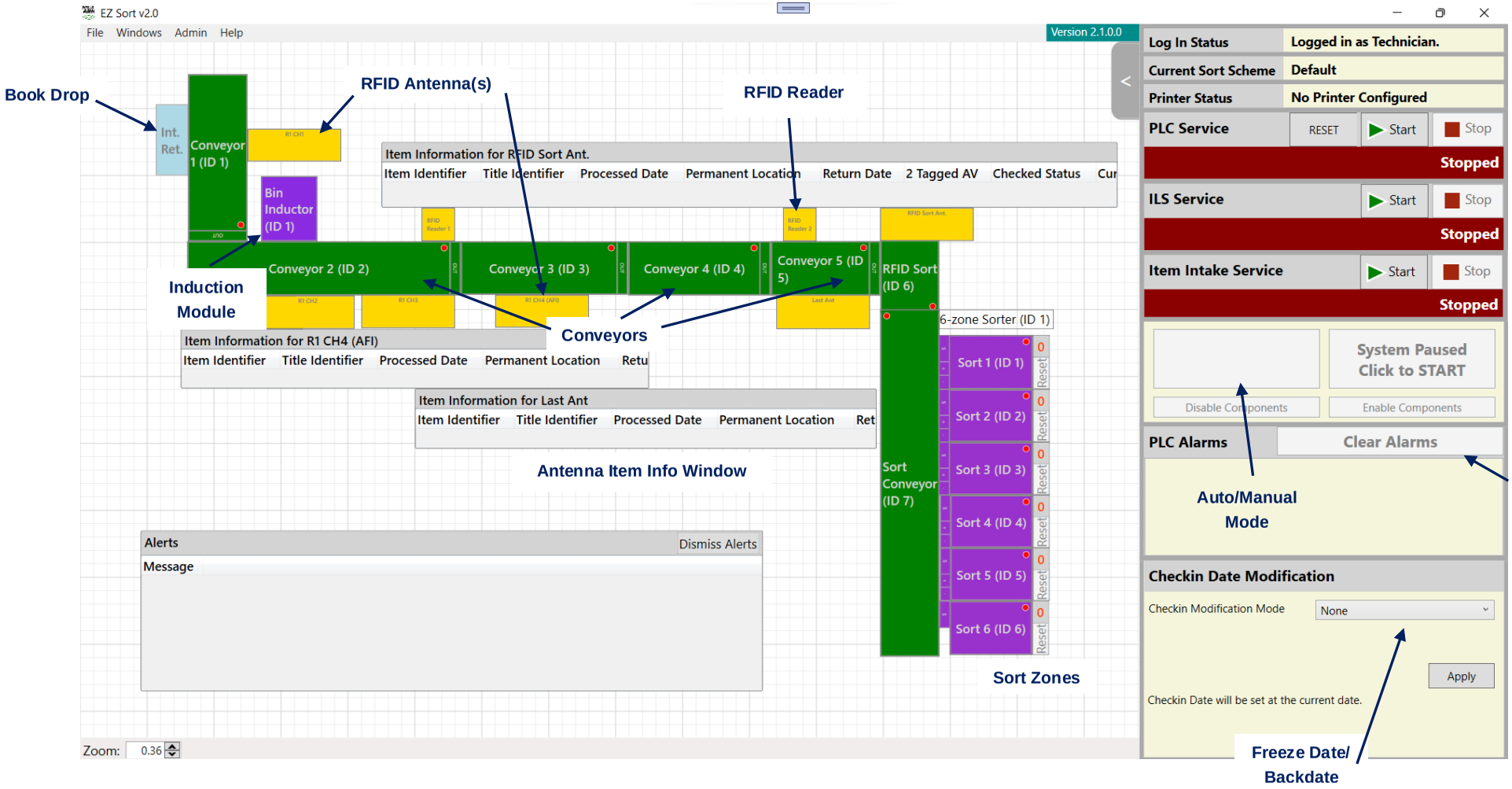
The final Main user interface tool is the 'Windows Shortcut', 'Administrative' and 'Login' tabs. They are found in the upper left-hand corner of the screen. The 'File' tab leads to the login capability for the EZ Sort Software. The 'Windows' tab presents a drop-down menu to access various user windows to view system information, change settings or view software logs. The same tabs area, once logged in, displays the 'Admin' tab to control common administrative settings.

To close out of the software, click on the red 'X' in the upper right-hand corner.

Window Shortcuts

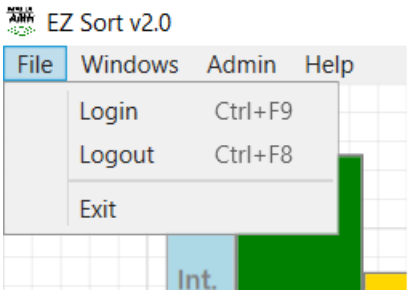
Graphical Lay-out of System

Status/ Control Column



3.3 LOGGING ON/OUT AS ADMINISTRATOR/TECHNICIAN

Logging in to the system is not necessary for normal system operations. When administrative or technician functions need to be accessed, a user may log in to the system by clicking on the 'File' tab on the upper left corner of the main user window. A dropdown will display, click on the 'Login' tab.

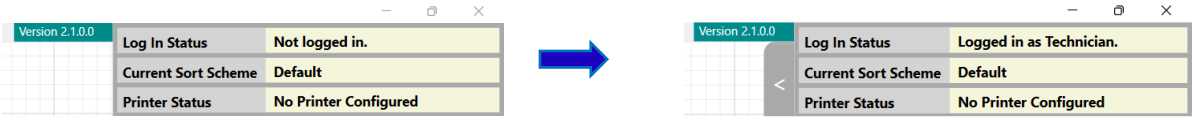


The Technician and Administrator's log in screen will open and is shown here. Enter the correct User Name & Password assigned, then click 'Ok' to proceed.

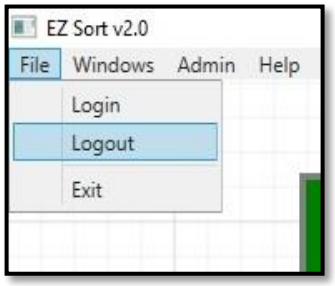
User Name: _____

Password: _____

Confirmation of the current 'Log in Status' is displayed in the upper right-hand corner of the Main user interface in the Status/Control Column. The 'Log in Status' bar will indicate the users approved access level. The three levels available are Technician, Administrator and General User. The illustrations below show the differences when logged in as Technician versus everyday user.



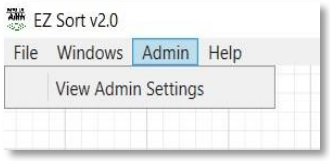
Logging out of the software is done by clicking on the 'File' tab in the upper left corner of the Main user interface. A dropdown will appear, select 'Logout' from the list and the access level will return to general user status.



3.4 VIEW ADMINSTRATIVE SETTINGS

The Administrative Tab allows users to add, change or delete various system settings. They include the ability to register emails for alerts, select printer usage, adjust ILS connection settings and SIP message fields, as well as modify the passwords used to access the EZ Sort software administrative rights.

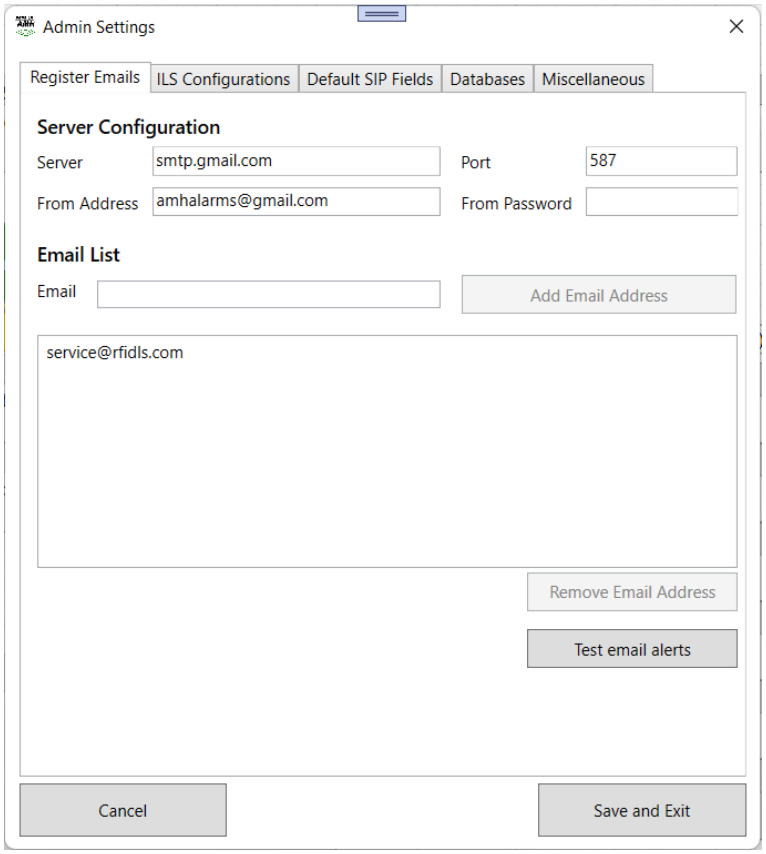
To view the administrative settings, log in to the system as an Administrator or Technician following the directions listed in Section 3.3. Next, click on the 'Admin' tab at the top left of window as illustrated below.



A new screen will open to display the Admin Settings. Tabs across the top are tabs that allow users to change between the various options. The following pages discuss each tab's functionality and how to configure their settings.

Register Emails:

The ‘Register Emails’ tab allows libraries to send system alerts/alarms to a list of personnel via email. Use the screen shot below for reference and the descriptions that follow for configuring this feature.



‘Server Configuration’ settings are at the top. Four fields are available to allow communication with an email server. Each is listed below along with information required.

Server: This is the target address of the email server. EZ Sort supports sending emails via SMTP servers.

From Address: This is the email address created on the server that will send the alerts/alarms out to the user email list.

Port: Enter the port number for server. This is usually 587.

From Password: If the ‘From (email) Address’ and ‘Server’ require a password for access, enter that ‘Password’ here exactly as created.

Below the configuration settings is the list of recipients. To enter a new email address, place the cursor in the ‘Email’ text box and input a valid as well as correct email address. Next, click ‘Add Email Address’ button to record the address on alert list.

To delete an email address from the list, click on the desired address in the list box. Once highlighted, press the ‘Remove Email Address’ to delete the name.

As a Reminder – Be sure to click ‘Save & Exit’ prior to closing window! This will ensure data is saved.

ILS Configurations:

The 'ILS Configurations' tab is used to set-up the correct communication pathway to the Library ILS (Integrated Library System).

ILS IP Address: Enter the IP address of the ILS, provided by the Library's IT staff.

ILS Port: Enter the IP address of the ILS, provided by the Library's IT staff.

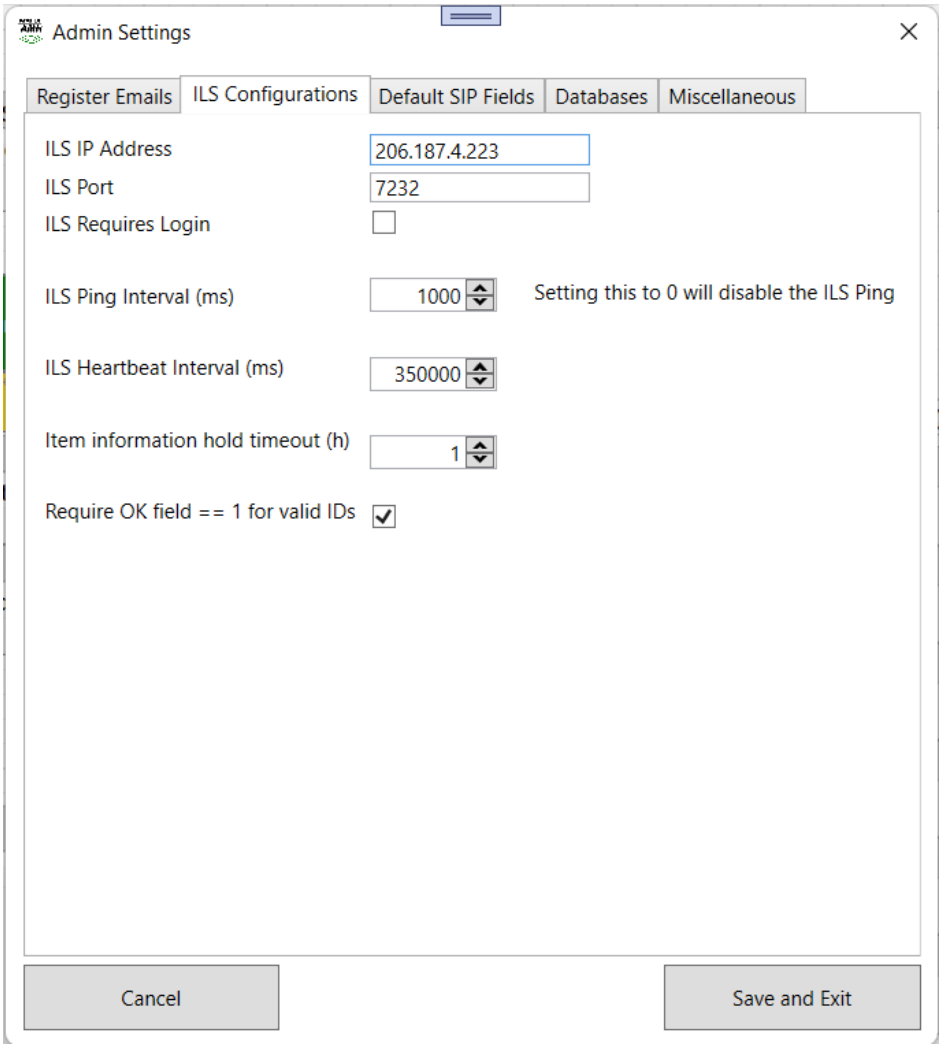
ILS Requires Login: Check this box if login credentials are required. Credentials can be configured on the next tab

ILS Ping Interval (ms): Controls how frequently EZ Sort checks to ensure the ILS is still connected. A typical interval is 1000 to 2000ms.

ILS Heartbeat Interval (ms): Controls how frequently EZ Sort re-authenticates with the ILS. For many locations, this can be phased out (set to 0), in favor of a more intelligent background authentication process.

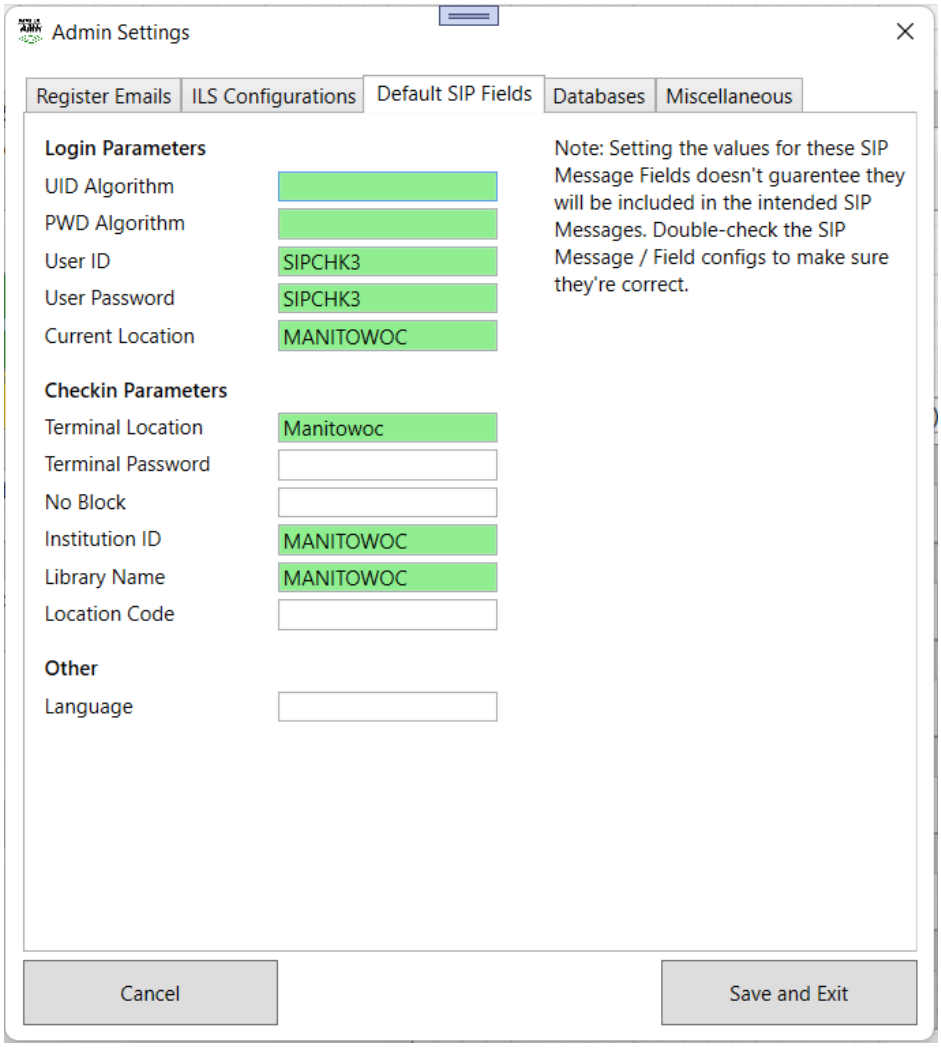
Item Information Hold Timeout (h): This is an experimental setting intended to control how long EZ Sort retains cached information about items, to reduce SIP communication overloading. 1-2hrs is typical. This setting may be phased out in the future.

Require OK Field == 1: Controls whether or not SIP field 'OK' must come back as 1 when sending a check-in message. This determines whether or not EZ Sort will require this indication to prove an item is 'valid' to continue sending and receiving other messages for this item. For most installs, this box should be left checked.



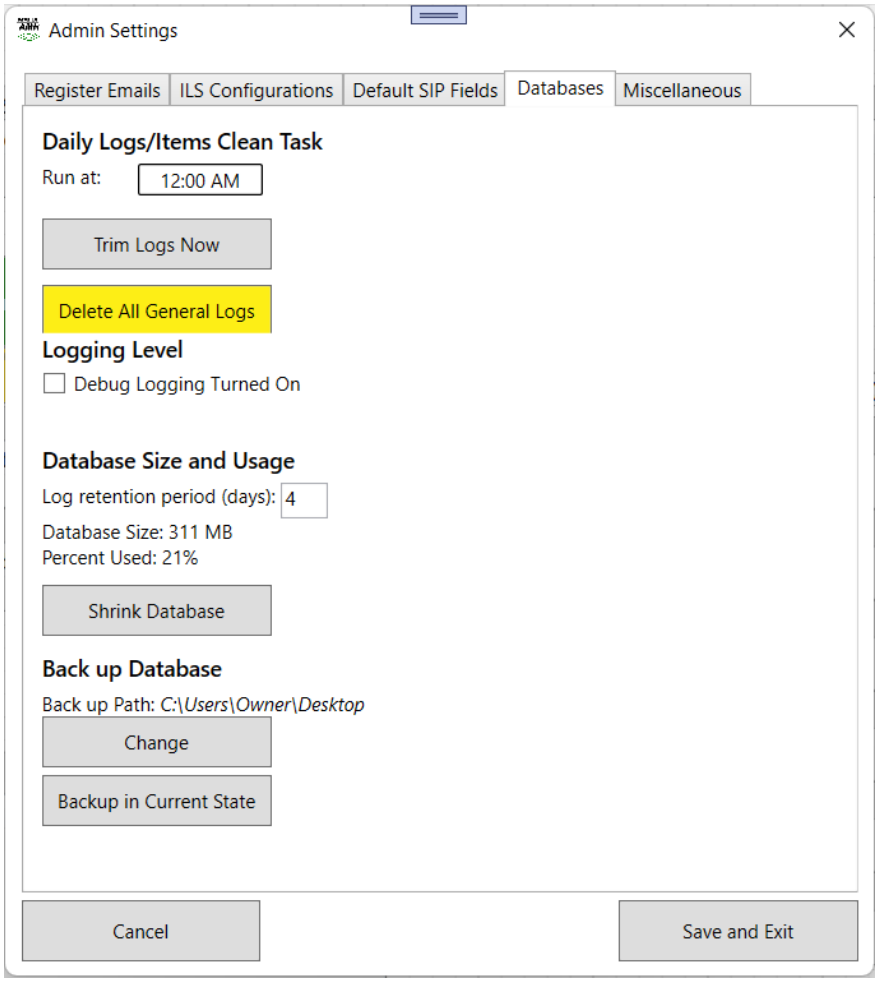
Default SIP Fields:

Allows Technicians and Adminstrative users to enter &/or alter key SIP Message Fields used to identify the Library. The “Default SIP Fields’ are divdided into two categories, Login and Checkin Parameters. In both categories, data is not always required in the fields for the system to communicate properly. Within the ‘Login Parameters’, the ‘User ID” and ‘User Password’ are commonly required fields. Also, depending on the ILS vendor, the UID & PWD Algorithm’s can be a ‘0’, ‘_’ or space bar. Particularly if the ILS server needs login permission. The ‘Checkin Parameters’ are typically filled in more completely. Terminal Location & Password, Institution ID, Library Name, and Location Code are frequently needed fields to communicate with the ILS using SIP protocols.



Databases:

The ‘Database’ tab has a couple of functions. The first is used for choosing a time during the day when the daily database and item history logs are cleaned up in the software. Typically, the best time to do this is in the middle of the night when little activity is present. The second function is for selecting the logging level detail. Adding a check mark to the tick box turns on very detailed system logging of tasks. This feature is primarily used when troubleshooting system issues. The primary use of this tab is for creating a backup database copy of the EZ Sort software. From the window, an administrator or RFID LS Technician can either press the ‘Backup in Current State’ button to initiate the backup process or click on the ‘Change’ button to alter the path on the CPU where the EZ Sort backup copy is saved. When the ‘Change’ button is pressed, a new window appears to allow the user to select the save location on the computer. Clicking the Backup button starts the save process. It might take several minutes for the backup to complete. The backup copy is strictly used for restoring settings to the EZ Sort software application using a separate RFID LS restoration application. An RFID LS technician is required to perform this restorative process.



Miscellaneous:

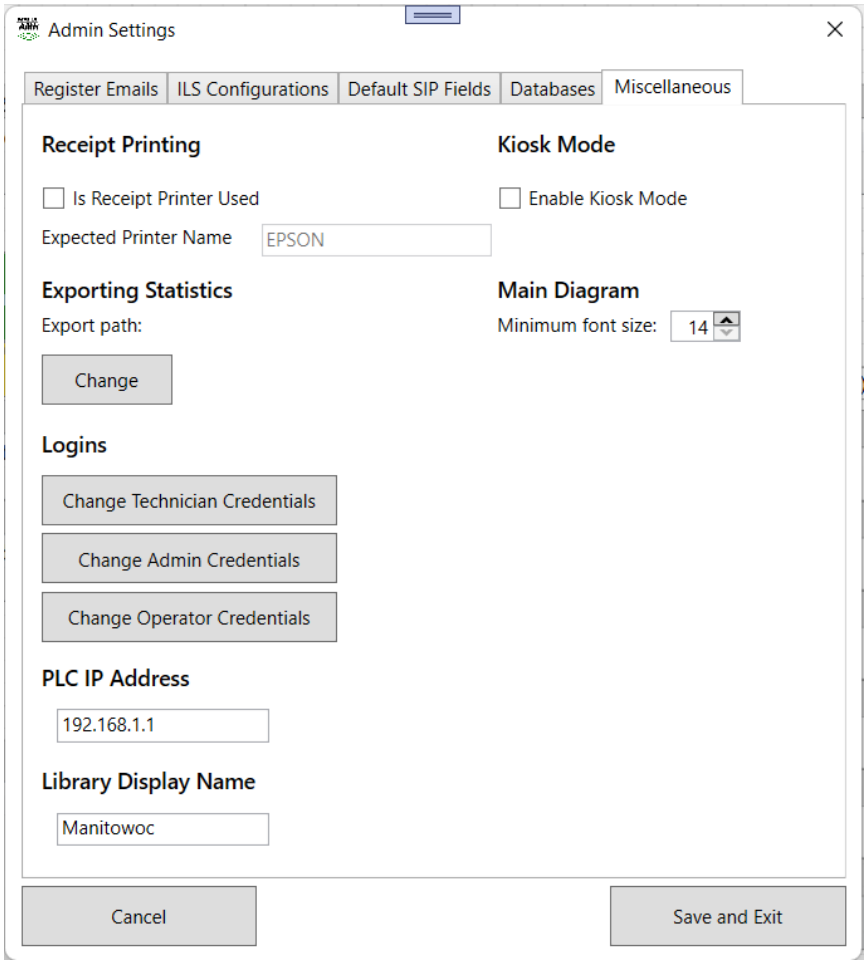
The ‘Miscellaneous’ tab is a catch-all window for various administrative features and settings in the EZ Sort software. Below is a description of the features available.

Use the box under ‘Receipt Printing’ to put a check mark if the AMH system is to use a receipt printer for holds or transit slips. The absense of a check mark means NO printer is in use. An EPSON brand printer is only model compatible with the EZ Sort software.

The next usage feature down is ‘Exporting Statistics’. The ‘Change’ button is only used for selecting the pathway of where system stats will be saved on the CPU. Clicking the button brings up a secondary window that lets the user determine the location. To export statistics, open the ‘System Information’ window and click the grey ‘Export’ button in the lower left corner. See page 34, section 4.1.12.1 Using the System Information Window.

On the right-hand side, a checkbox for Kiosk Mode is present. This feature is only used in special cases.

Directly below Kiosk Mode is a font size changer for the main window of EZ Sort. If larger or smaller font is desired for readability of components on the main diagram, it is suggested that small changes (+/- 1) are made at a time, so you can see the difference between them. Click up or down, and then click ‘Save and Exit’ to apply the change.



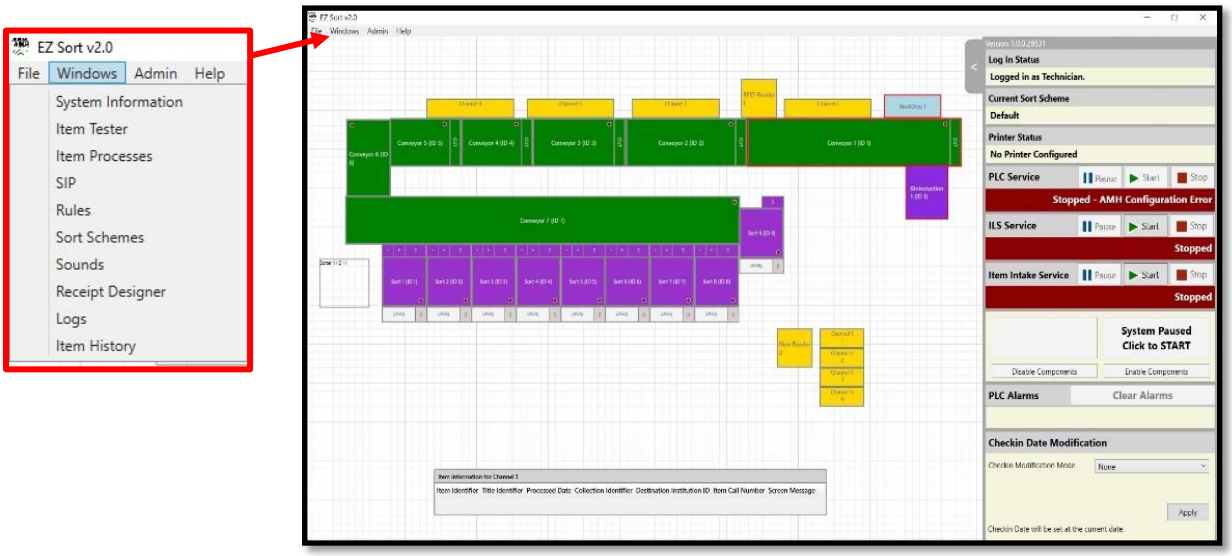
In the ‘Logins’ section, the three user types have the ability to set as well as change access credentials. **Only RFID LS Technicians have the power to change or set user ID’s and Passwords.** General Operators and Administrators do not have access to changing user credentials.

To change credentials, click on the desired user level to alter. This will open a second window in which the user is prompted to input the current password, type in a new password and then re-confirm the new password. Once all the information is entered, press the 'Update Password' button to complete the changes. There are no extra security requirements or rules as it pertains to the complexity of the password. Make it as difficult or easy as required.

The 'PLC IP Address' is where network number of the PLC computer is entered. Library users should never alter this setting. The final text box is used to denote the name of the AMH system. This name is used in email alerts as well as back-up copies saved.

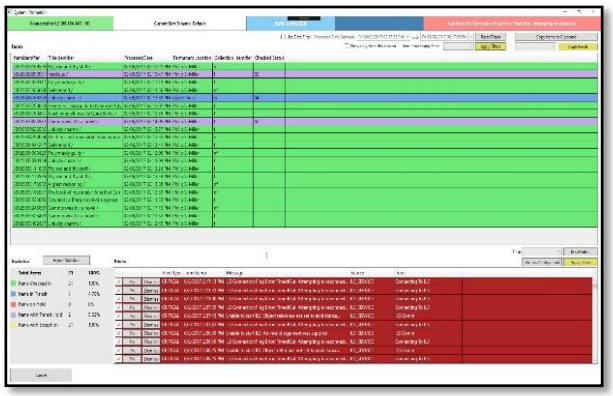
3.5 USER SHORTCUT WINDOWS

Users may change viewable screens to check the status of various system processes. For example, review the item information received from the ILS, view all the items that have been processed by the sorter, adjust sort rules/groups, or examine SIP settings. To open any of these user screens, click on the 'Windows' tab in the upper left corner of the main user interface. See red box below…



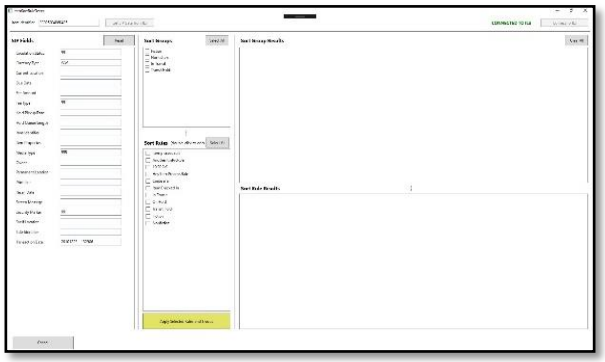
SYSTEM INFORMATION

Displays the status for several key AMH processes using colored tabs across the top row. They include ILS connection, current sort scheme, system Running/Paused state & Last alert. It also provided a list of all the items processed through the sorter. Items are color coded by type: Hold, Transit, Transit Hold, Checked-in or Exception. General statistics are presented on the screen in the lower left corner. A list of recent alerts and system alarms is also supplied on the window.



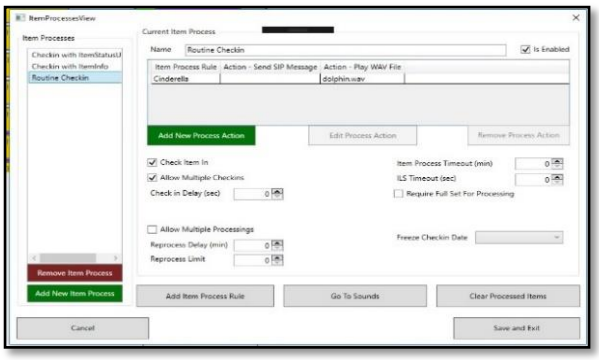
ITEM TESTER

Permits a user to read an RFID tag using a channel/antenna or manually enter a barcode into the EZ Sort software to view the SIP Fields returned by the ILS. It will then allow the program will test or compare created sort rules & groups to the SIP fields received. Rules and groups will be listed as green for 'True' and red for 'False'. Users may toggle through the Rules and Groups listings to analyze information in greater detail.



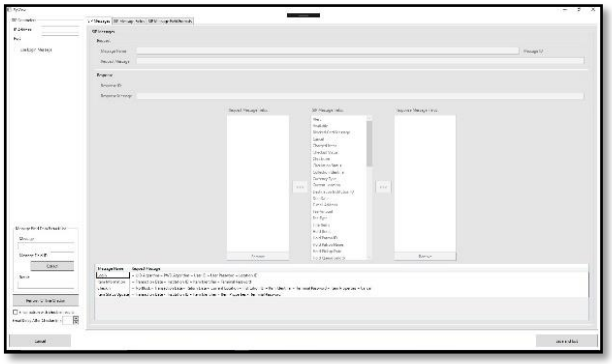
ITEM PROCESSES

The item process configuration screen can be used to create and modify the various 'Item Processes' used by the AMH system. Item processes will typically range from simply checking in items, to making item information requests, printing receipts, and playing audio indicators when an item is presented to the system. Item processes are typically assigned to antennas to accomplish tasks or processes.
NOTE: More in-depth explanations and function tooltips are available for this screen within the software. Configuration of Item Processes is typically a one-time operation left to an RFIDLS technician.



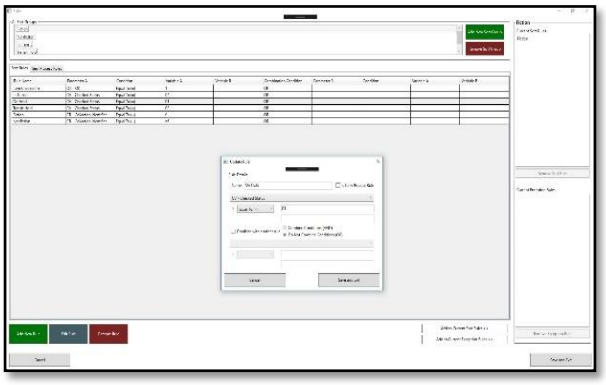
SIP

The SIP configuration screen provides a very flexible means to set up the messages used to communicate with the Library ILS. SIP communication is done by sending and receiving SIP Messages. Each SIP Message is made up of SIP Message Fields. Each SIP Message Field is formatted based on specific SIP Message Field Formats. The different SIP Screens provide the tools required to match the specific ILS requirements of a Library to the RFID Library Solutions software.
NOTE: Configuration of SIP messages/fields is typically a one-time operation left to an RFIDLS technician.



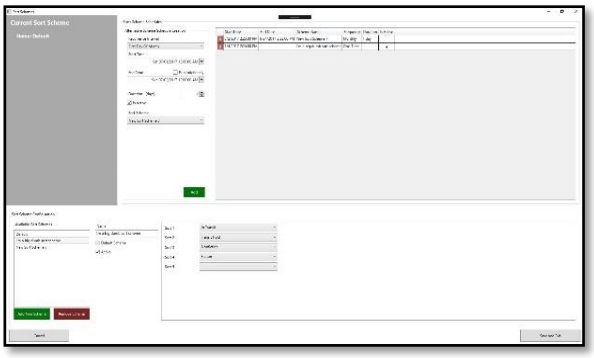
RULES

The Sort Group Screen allows for adding, removing, and editing of Sort Groups. Sort Groups are a collection of Sort Rules which govern how the sorting system sorts items into their respective locations. A Sort Group contains Sort Rules and Exception Rules. Sort Rules act positively on an item's sorting, that is: if a Sort Rule result is true, the item will sort to that location. Sort Exceptions act negatively on an item's sorting, that is: if a Sort Exception result is true, the item will NOT sort to that location.



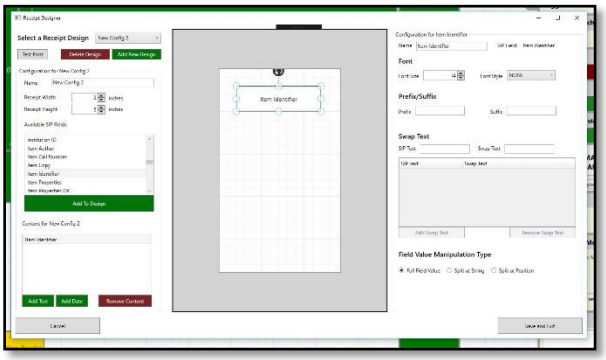
SORT SCHEMES

Allows users to create and adjust different sorting schemes for the sorter. The system will always have a default/primary sort zone organization. Alternate organization groups may be configured that are used at various times of the year, month or day. For instance, a library may sort material to a re-shelving scheme during the day and use the sort at night to organize transit material for branch delivery.



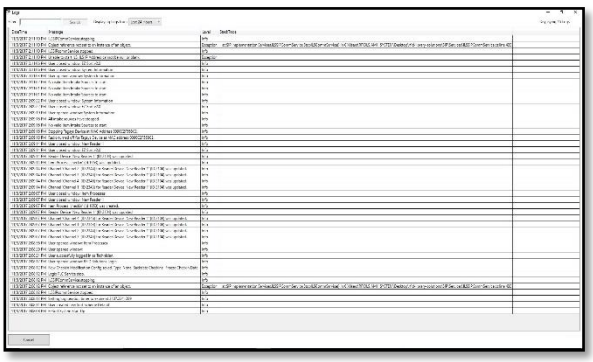
RECEIPT DESIGNER

The Receipt Designer window allows Administrators & RFID Technicians the ability to create custom Hold or Transit slips. Multiple designs may be developed as well as used simultaneously by the AMH system. The types of information that can be add on the paper include constant text data, SIP Message Field data, dates, Patron Hold details, etc. The Designer has been programmed for great flexibility when trying copy an existing sample or pull partial field data from a SIP Message.



LOGS

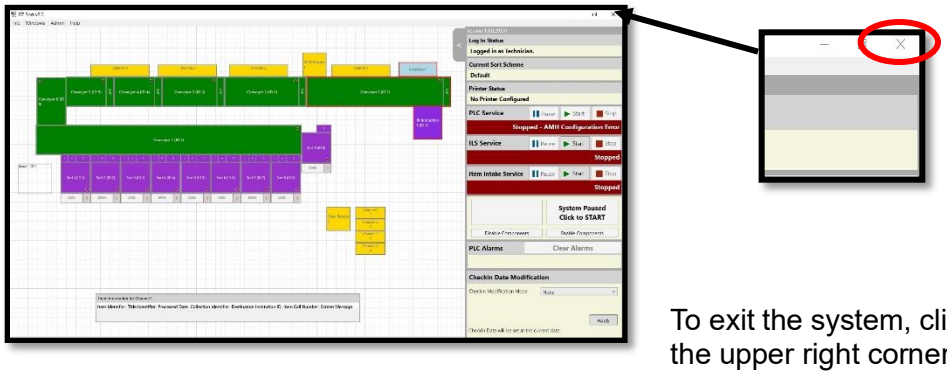
Allows users to view and scroll through the various log events recorded by the EZ Sort software. Any action performed by the software, including user log-ins, Pausing or Starting of the System, SIP communications, Barcode ID recognition by and RFID antenna pad and many other events are listed on the ‘Logs’ screen. A search bar is available to help find details more quickly, as is a dropdown to choose a window of time to view system logs.



ITEM HISTORY

Allows users to search through the EZ Sort database for an item's SIP response history. Enter the item ID (barcode) in the text box & press Search. The item history will display for the past 6 months. Select your start and end date parameters to filter out dates outside the necessary search range. Use the tick boxes to add or eliminate item types – i.e. Holds, Transits, Exceptions, etc. The SIP Message Fields will display for each time the item passed through the sorter.

3.6 EXIT SYSTEM



To exit the system, click the 'X' button in the upper right corner of the screen.

4.0 USING THE AMH SYSTEM

This section details how to operate the system. It describes how to start/stop the main Services (PLC, ILS & Intake), put the system into Run Mode, set the check-in date options, configure sort rules, re-set sort zone item counts and system data reporting.

4.1 USING THE AMH SYSTEM (SORTING)

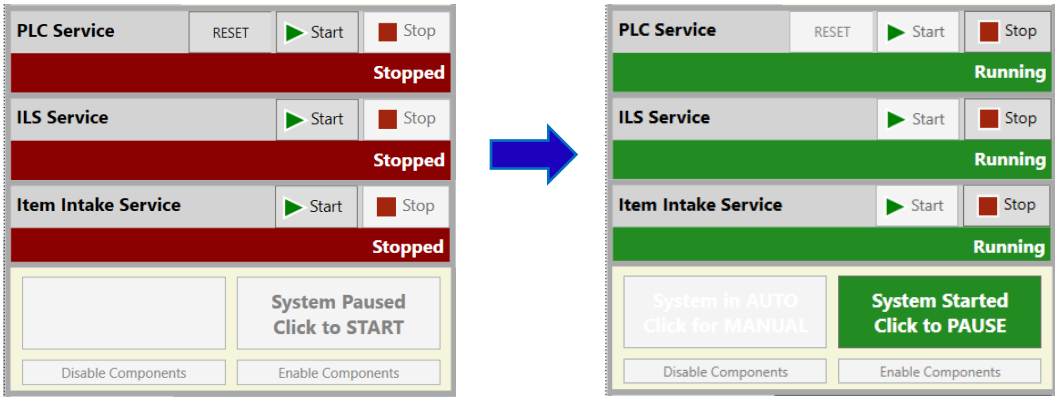
Once configured, the primary use of the EZ Sort software will be the operation of the AMH or Sorting system. This section will describe the steps required to operate an RFID LS AMH system.

4.1.1 STARTING THE SYSTEM SERVICES

Three primary system services are responsible for communication between the various hardware installed. They are the PLC, ILS and Item Intake Services. Each can be found on the right side of the Main User Interface in the Status/Control Column.

- The PLC Service initiates the heartbeat between the EZ Sort software program and the mechanical control program in the system's power panel. If the PLC Service is not started, conveyors will not move.
- The ILS Service is responsible for SIP communication between the AMH staff station CPU and the library ILS server. If the ILS Service is not started, material will not check-in.
- The Item Intake Service is the final process to activate. It initiates the RFID readers and begins processing items as they are seen by antennas located throughout the conveyors.

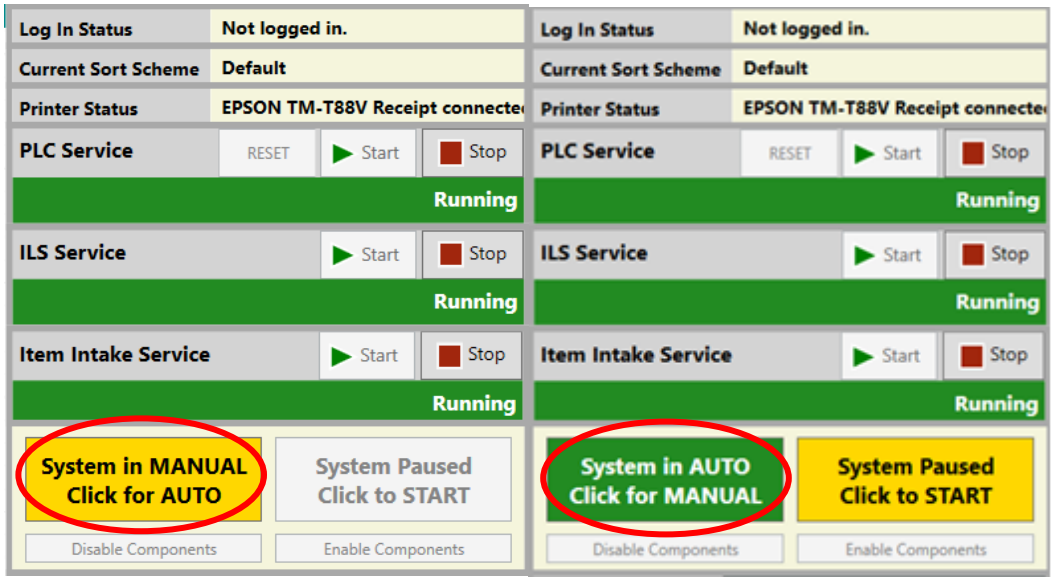
Services may be started by clicking on the 'Start' arrow in each service row. A service is operating correctly when the red row changes to green and reads 'Running'. Please note that the PLC Service contains an additional 'RESET' button (RESET must be used any time sort rules are added, removed, modified, or moved among zones); No issues will be caused by inadvertently using this button instead of the 'Start' button, but the service will take much longer to connect and turn green. The pictures below display the differences between a stopped Service and a running one.



If a Service does not start, the row will remain red and an Alert will display in the Service row that describes the issue. Each service error will have different consequences as well as areas to search for resolution. PLC Service errors will require an RFID LS Technician to diagnose. ILS service issues could mean a lost connection to the server, loose Ethernet cable or down network. An Item Intake Service error involves the RFID readers. Re-starting the readers or checking their network connection is a good place to start to get this service working again.

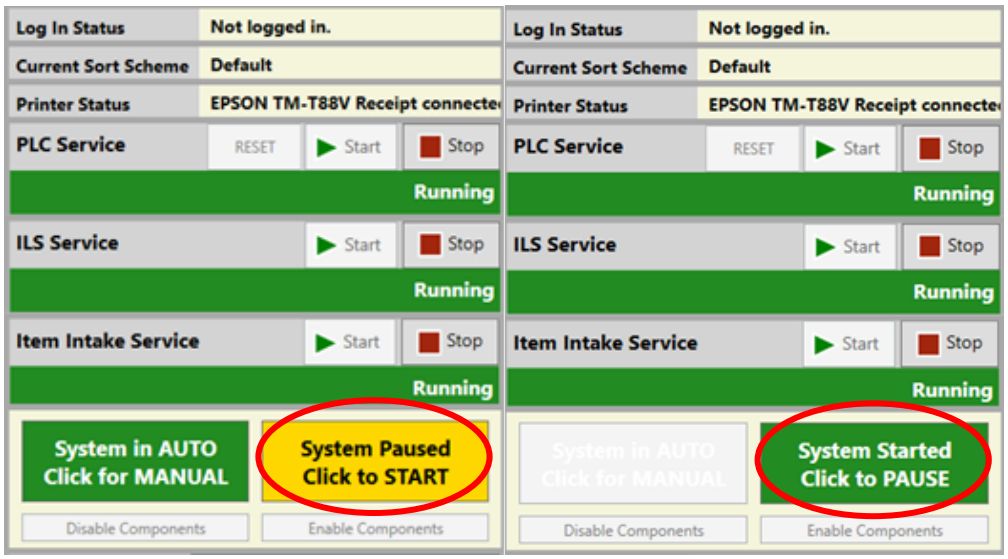
Once all three Services are green and running, a user may begin operating the AMH system by placing it into Automatic and Start Modes. See the next section for how this is done.

4.1.2 PLACING THE AMH INTO AUTOMATIC MODE



For the AMH system to run automatically, it must first be put into Automatic Mode. Upon start-up of the EZ Sort software the system will be in Manual Mode. Clicking the yellow button shown above will toggle the system between Manual and Automatic modes.

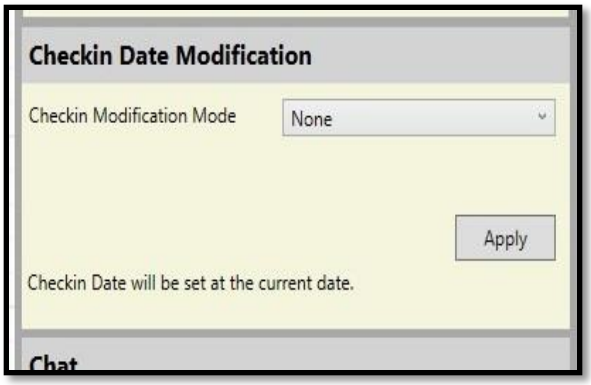
4.1.3 PLACING THE AMH INTO RUN MODE



Once in Automatic mode, the system may be started by clicking the yellow button shown above. This button toggles the system between Running and Paused mode.

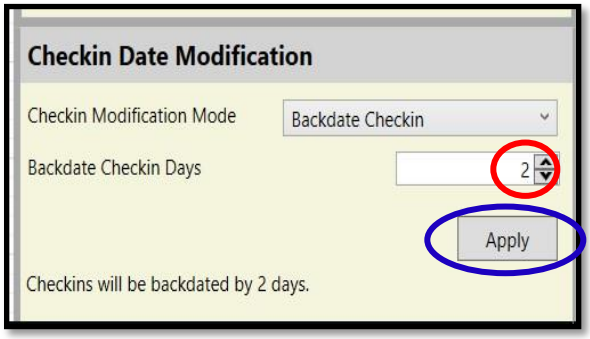
4.1.4 SETTINGS FOR CHECKIN DATE MODIFICATION

Often it is desirable to modify the check-in date of items as they are processed by the AMH system. At times, it may be necessary to Backdate items a day or two. At others, it may be useful to Freeze the Checkin date of items. Many libraries use this feature to hold the check-in date overnight until the library re-opens the next morning. The ability to adjust dates can be found in the lower right corner of the Main User Interface. Look to the bottom of the Status/Controller Column. An illustration of the 'Checkin Date Modification' center is shown to the right in its default state – checking in items in real time with a current date stamp.

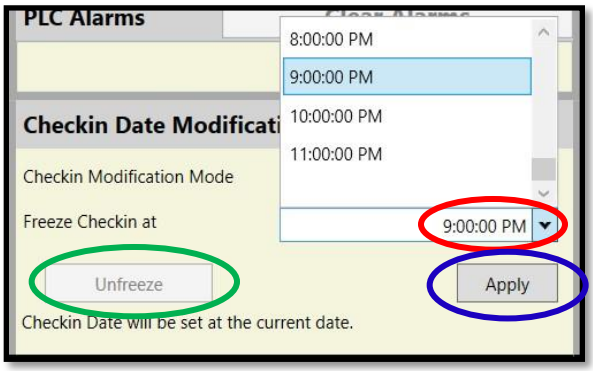


To enable Backdating or Freezing, click on the down arrow to display the dropdown menu. Select the desired check-in feature to present the viewable configuration choices. Below are instructions on how to activate as well as disable Backdating or Freeze Check-in Date. A key step in making sure the 'Check-in Date Modification' center records the desired date is to click the 'Apply' button. It ensures accurate returned dates.

Backdating: When enabled, backdating of items will result in the item being checked in any number of days prior to today's date. Use the text box to manually enter a number or arrows to increase/decrease one integer at a time. See red circle. Hit 'Apply' when desired number of days to backdate is input. See blue circle. A confirmation notice will display in the lower left corner.

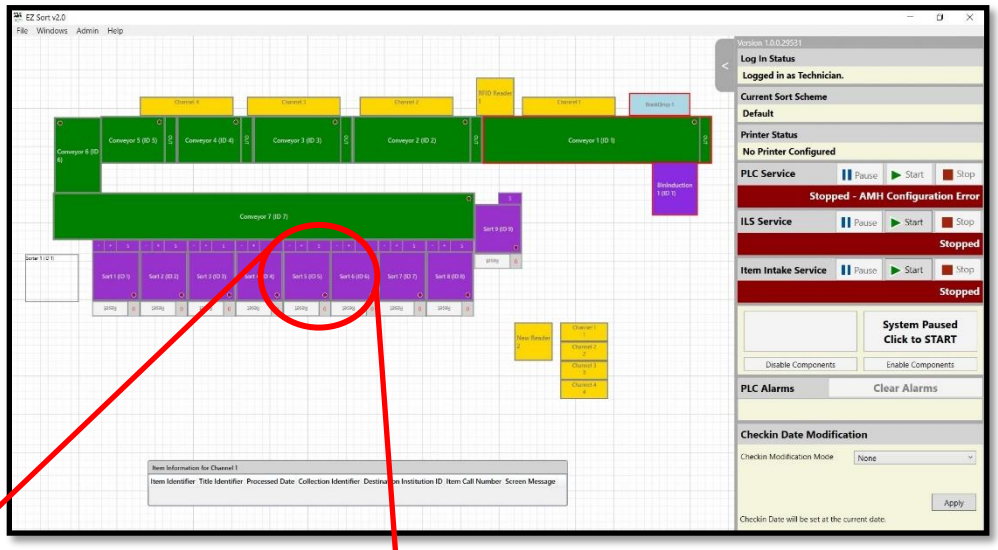


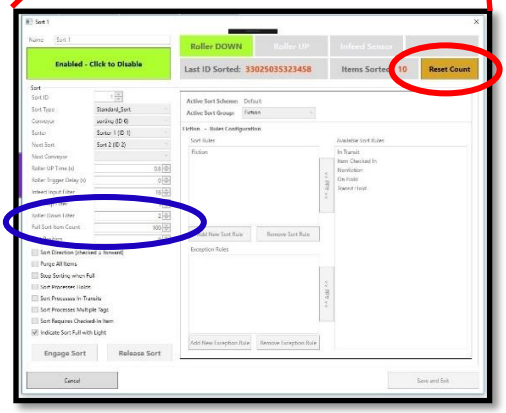
Freezing: Freezing the checked-in dates of items result in the items being checked-in at the selected date and time. Use the text box to manually enter a time or down arrow to select one from the pop-up menu. See red circle. Hit 'Apply' when desired time is entered to freeze the check-in time for the day. See blue circle. A confirmation notice will display in the lower left corner. When enabled, the system will AUTOMATICALLY lock the check-in time to 9:00 PM on the day activated. Check-in time stamps will STAY at this time until the 'Unfreeze' box is clicked. See green circle. For example, a library may use this feature to freeze the check-in date over a long Holiday weekend.



To deactivate Backdating or Freeze Checkin Date, simply click on the down arrow in the mode box, and select the 'None" option from the dropdown menu. Click the 'Apply' button to return the system to real-time item check-in. A confirmation will display in the lower left corner.

4.1.5 RESETTING SORT ITEM COUNTS





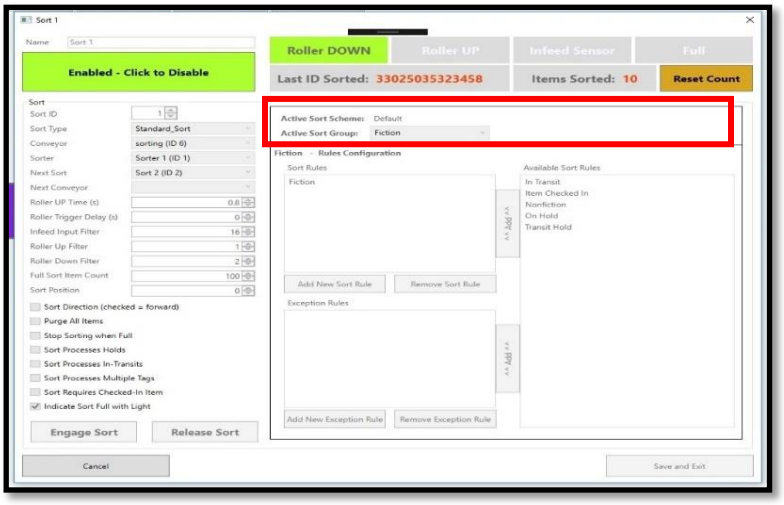
Periodically, as the system operates, the sorts will collect enough items to be designated as "Full". When this happens, an indicator light at the sort will light. Additionally, the corresponding sort button on the AMH screen will be colored blue. To reset the sort's Full Item Count and turn off the blue light, press the blue button at the sort zone or open the corresponding Sort Screen. Click on the orange 'Reset Count' button in the upper right corner. *(Picture to the left – red circle)*

The 'Full Sort Item Count' quantity can be adjusted as needed by staff. To increase or lower the count, click on the appropriate purple sort zone to open the Sort Screen. Find the 'Sort Item Full Count' row, highlighted in blue circle, and change the total using the arrows or manually enter the number. Click 'Save & Exit' to keep any changes made on screen.

4.1.6 SORT SCREEN

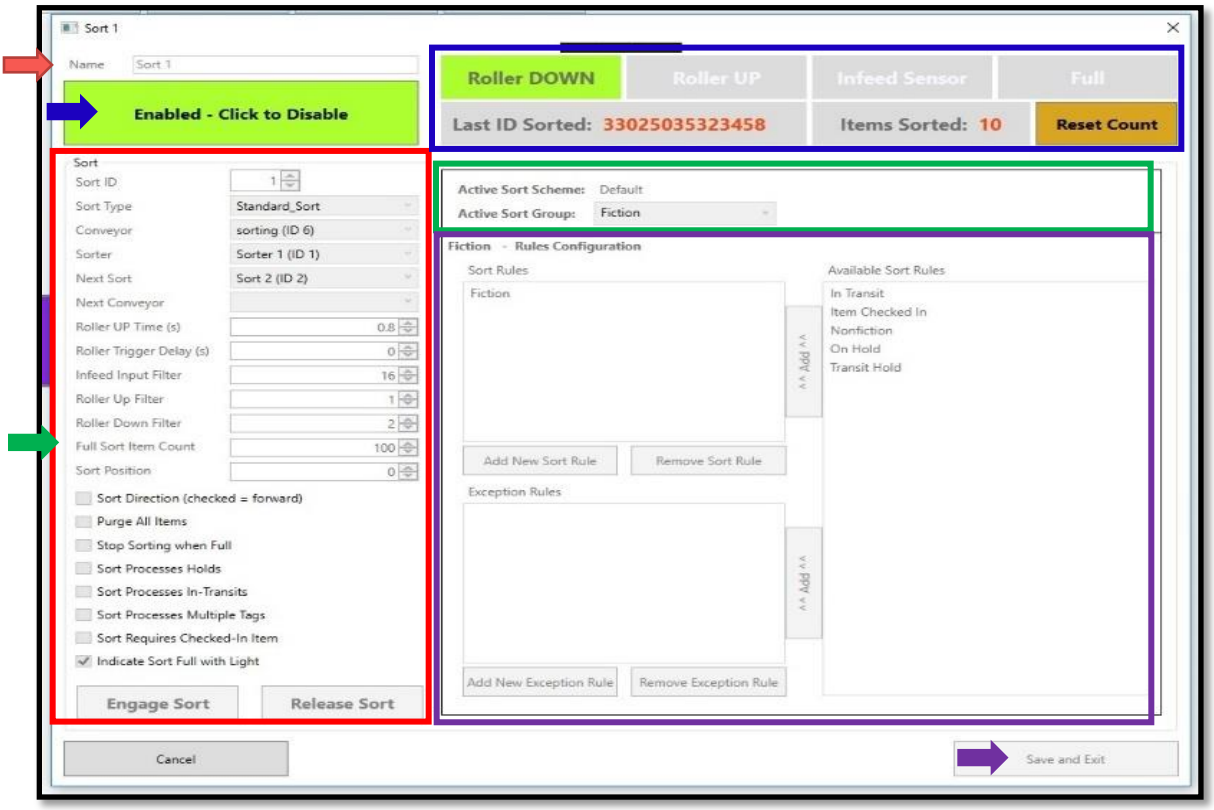
4.1.6.1 MODIFYING SORT RULES

Sorts Sort Rules may be created or changed at any time. But, when doing so, the AMH should be 'Paused', placed in 'Manual' mode, and the 'PLC Service' stopped. To modify a rule, click on the desired purple sort zone on the main user screen. The Active Sort Scheme & Group used by the zone is displayed near the top right of the window *(See red box to the right)*. Within the screen, an existing Sort Group may be selected for use in the zone; or a new or existing Sort Rule may be added to the current Sort Group. The following section details how this window is used.



4.1.6.2 USING THE SORT SCREEN

The Sort Screen is used to configure and modify sort settings, as well as view the current status of each individual sort zone on the AMH system. The Sort Group box contains the sort Name, an Enable/Disable button, zone status bar, Technician configuration column, a list of the sort rules & exceptions used by the sort zone, a Full Sort Item Count, a Reset Count button, and a Rules Configuration area. The descriptions below define how each is used as well as its purpose.



Sort Name: (RED ARROW) Click in the text box to change the zone name.

Enable/Disable Button: (BLUE ARROW) Turns the sort zone on/off. Technicians will use this button to disable a zone when mechanical issues occur. Dark green means disabled, while light green indicates an enabled sort zone.

Zone Indicator Bar: *(BLUE BOX)* Displays real-time data of the sort zone. They include:

- *Roller DOWN: Denotes status of internal actuator in sort. Light green color indicates a down position.*
- *Roller UP: Denotes status of internal actuator in sort. Light green color indicates an up position.*
- *Infeed Sensor: Coincides with the sort sensor at the zone. Light green color flashes when item passes under sensor.*
- *Full: Box lights up when the 'Full Sort Item Count' limit is reached. Blue button at sort bin also illuminates.*
- *Last ID Sorted: Displays the last barcode ID sorted to bin.*
- *Items Sorted: Bin item count since last reset.*
- *Rest Count: Clicking on this button re-sets the zone item count.*

Technician Configuration Column: *(RED BOX)*
The configuration settings within this column are ONLY accessible by RFID LS Technicians. They are password protected to ensure reliable operation of the system. The 'Full Sort Item Count' is the one entry users with administrative privileges may modify.

Full Sort Item Count: *(GREEN ARROW)*
Each sort zone maintains a count as items are sorted to it so that users may set a quantity limit that determines its full state. This "Full Item Count can be changed as needed by manually entering a number or using the up/down arrows to set a quantity. The number is tracked by the PLC Service and is updated when the Reset Count button is pressed.

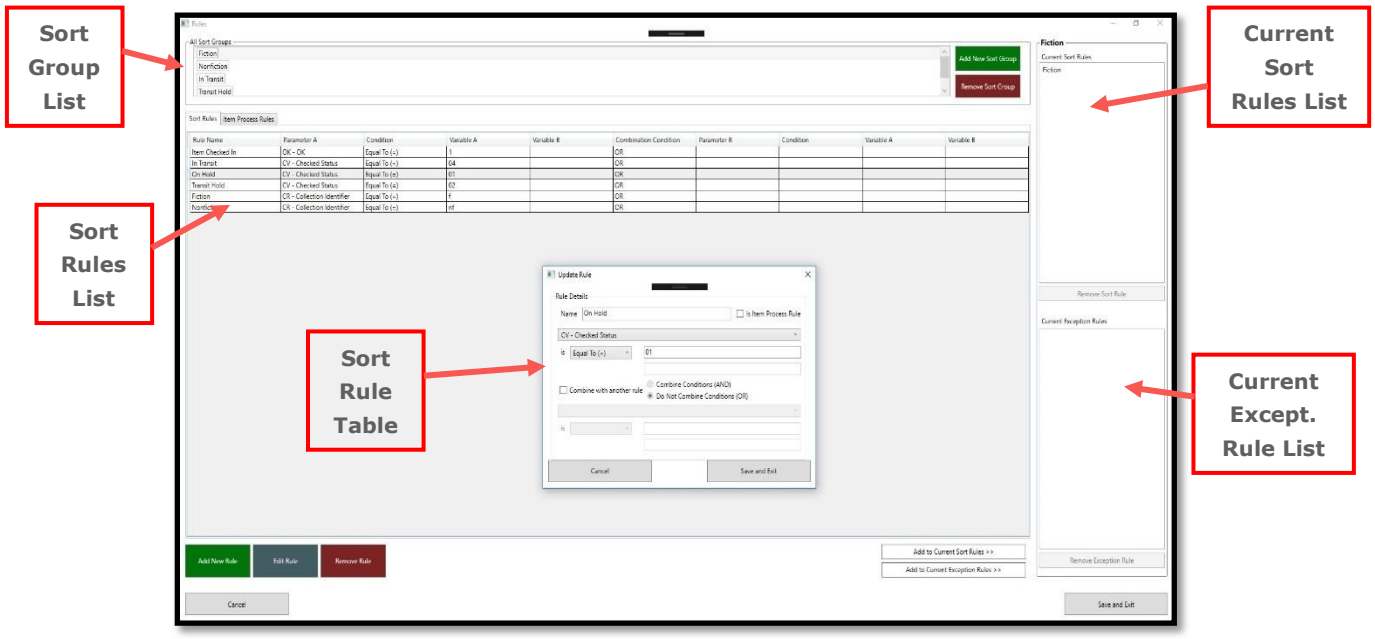
Active Sort Group: *(GREEN BOX)*
Clicking on the down arrow in the box will present a drop-down menu of all the sort groups created and available for use in the Active Sort Scheme assigned. Sort Schemes are created, assigned and scheduled in the 'Sort Schemes' window of the EZ Sort software. (*Upper left corner of Main AMH Screen, 'Windows' tab.*) Changing the Active Group will refresh the window to show the assigned rule & exceptions for the new group selected.

Rules Configuration: *(PURPLE BOX)*
Use the configuration space to add or remove rules & exceptions from the assigned column. Simply click on the desired rule or exception, then press either the Add or Remove button below the respective list box. An administrator may also add rules to the Active Group from the master list of sort rules created in the software on the CPU. If a rule is not in the master list, it must be created in the 'Rules' window of the EZ Sort software. (*Upper left corner of Main AMH Screen, 'Windows' tab.*)

Save & Exit Button: *(PURPLE ARROW)*
MUST be pressed to save new or modified settings in sort. If no changes are made, user may exit screen by clicking 'Cancel".

4.1.7 SORT RULE WINDOW

The Sort Rule Screen allows for adding, removing, and editing of Sort Groups. Sort Groups are a collection of Sort Rules which govern how the sorting system sorts items into their respective locations. A Sort Group contains Sort Rules and Exception Rules. Sort Rules act positively on an item's sorting, that is: if a Sort Rule result is true, the item will sort to that location. Sort Exceptions act negatively on an item's sorting, that is: if a Sort Exception result is true, the item will NOT sort to that location. Each Sort Group may contain 50 Sort Rules and 10 Sort Exceptions.

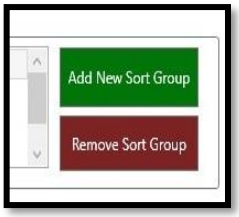


4.1.8 USING THE SORT RULES WINDOW

The following functionality is available in the Sort Rule Screen:

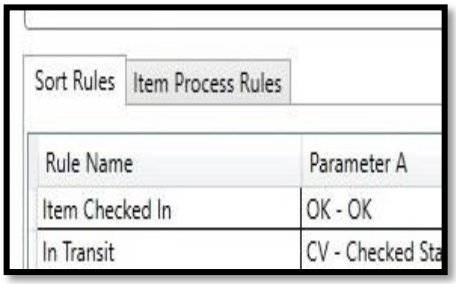
All Sort Groups: List of all the created and available sort groups on the AMH system.

Add/Remove New Sort Group: Use these two buttons to Add or Remove a sort group from the list. Clicking on Add New Sort Group will insert a new Group with a generic name. Use the mouse to click inside the text box to change the sort group name. Hit enter on the keyboard to accept label. To Remove a Group from the list, simply click on the group name to highlight, and then press the Remove Sort Group button.



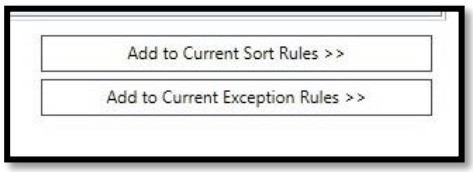
Sort Rules List: Provides a list of all the sort rules created in the EZ Sort software. Rules may be organized by columns to better find or view available rules.

Item Process Rules List: Provides a list of all the item process rules created in the EZ Sort Software. Users may toggle back and forth between rule tabs to create, edit or remove rules from both sections.



Current Sort Group Column: The 'Current Sort Group' column displays the highlighted sort group selected in the 'All Sort Group' list. The column will show the group name, a 'Current Sort Rules box, Remove Sort Rule button, a 'Current Exception Rules' box and Remove Exception Rule button. Rules may be remove from the Current Sort Group by clicking on the rule to highlight it, and then press the remove button. The selected rule will be deleted from the column.

Add Rule to Current Sort Group: Use these to buttons to add sort rules to either the 'Current Sort Rules' or 'Current Exception Rules column. Simply click on a rule in the 'Sort Rules' list to highlight it, and then press the appropriate add button to insert the rule into the 'Current Sort Rules' column.

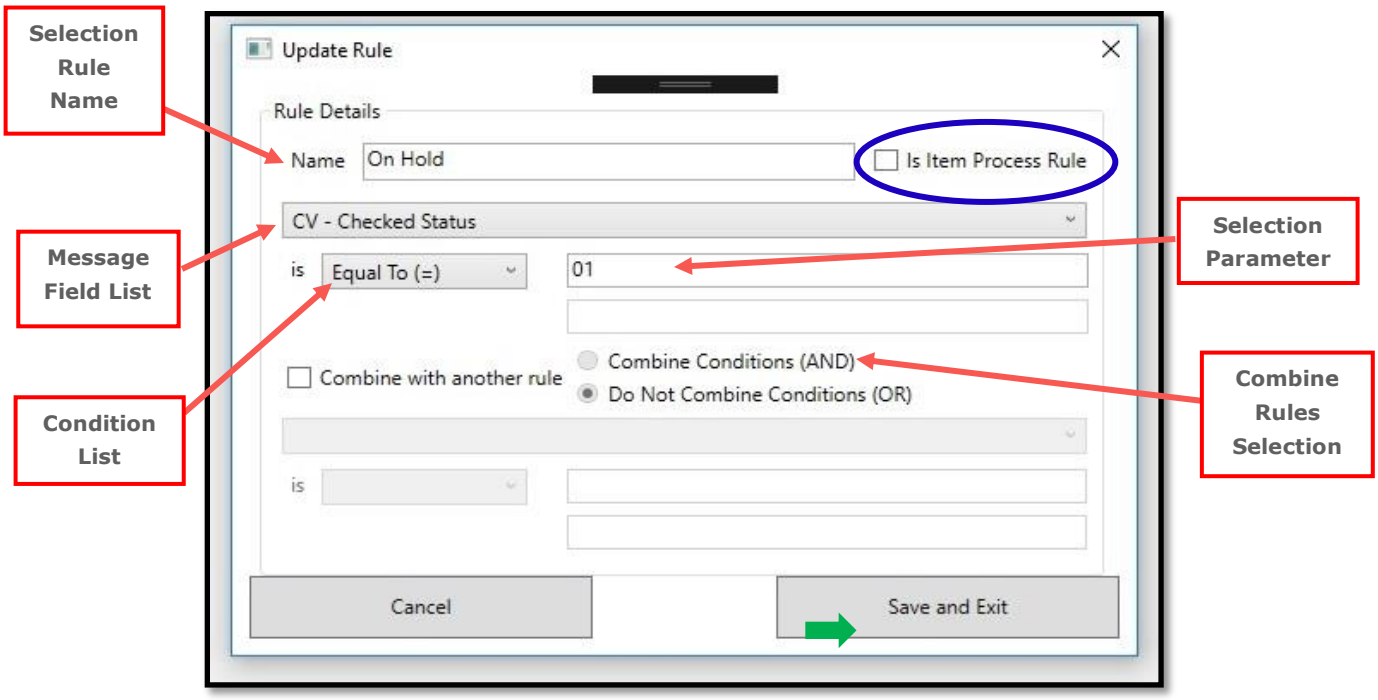


Rule Option Tabs: When adding or editing sort rules, use these three buttons to configure Sort Rules from either the Sort or Item Process Rules tabs. To add a rule, click on the green 'Add New Rule' button and follow the steps in the next section 4.1.9.1. To edit a sort rule, click on a rule from the list to highlight it. Next press the grey 'Edit Rule' button. Change the parameters as instructed in the following section. To remove a rule, click on the desired rule and press the red 'Remove Rule' button.

Save & Exit Button: **MUST** be pressed to save new or modified settings in Rules Window. If no changes are made, user may exit screen by clicking 'Cancel".

4.1.9 SORT RULE TABLE

The Selection Rule Screen allows a user to edit the parameters of a Sort Rule.



4.1.9.1 USING THE SELECTION RULE SCREEN

The following Selection Rule parameters can be adjusted:

Selection Rule Name: The Selection Rule Name is used to describe the sort rule.

Selection Parameter: The Rule Parameter is the ILS defined data from the Message Field. Extreme care and caution must be used when enter text into the parameter box. It MUST match letter for letter and is case sensitive. A space may even be utilized to further restrict a rule's use in a sort zone.

Condition List: The Sort Rule Condition drop-down arrow allows for the selection of the Rule's Condition. Valid conditions are: Equal To, Not Equal To, Greater Than, Less Than, Inside Range, Outside Range, and Contains.

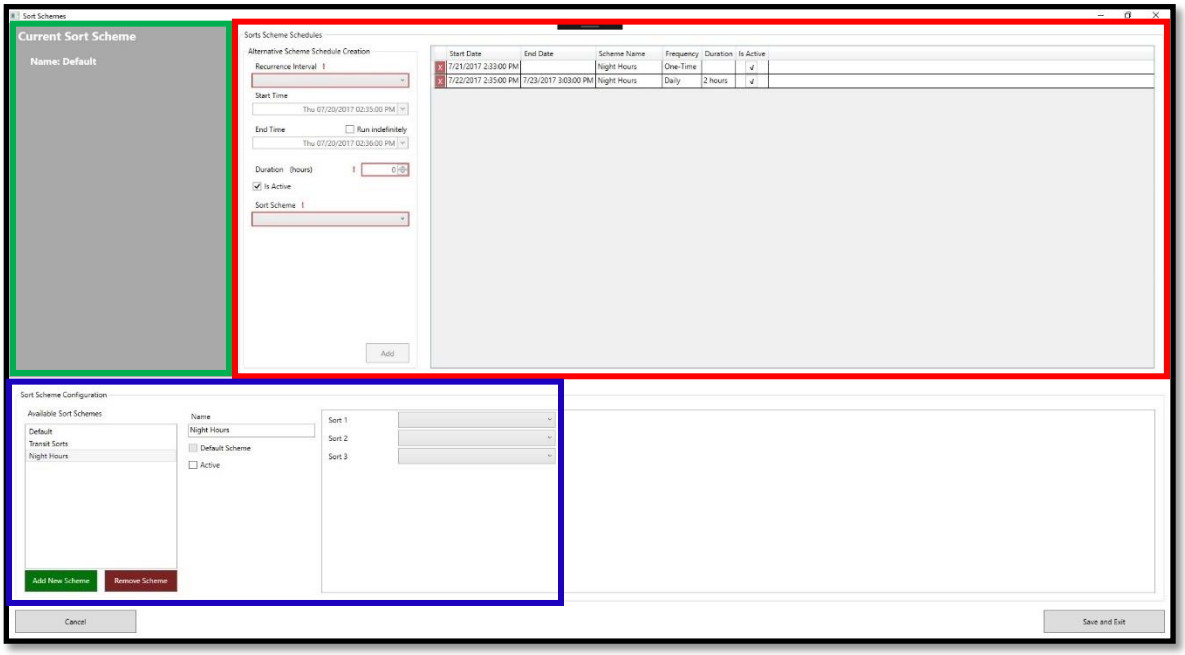
SIP Message Field: Use the drop-down arrow to bring up a menu list of SIP Message Fields available for usage in the rule.

Combine Conditions: Depending on a Library User's circumstances, additional variables may be used to fully define a selection rule. Use the 'Combine Conditions' tick box to enable combination sort rules. Since selection rule variables can be text, numbers or a combination of both, it becomes useful to further define rules. A Combination selection rule evaluates too true if both the first AND the second part of the Sort Rule are true.

Save & Exit Button: **MUST** be pressed to save new or modified settings in Rules Window. If no changes are made, user may exit screen by clicking 'Cancel".

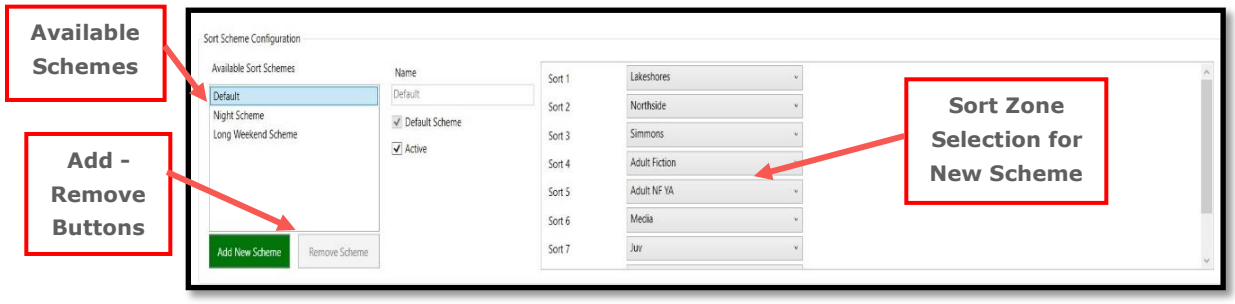
4.1.10 SORT SCHEME WINDOW

The Sort Scheme window allows for adding, removing, and editing of sort schemes created in the EZ Sort software program. A Sort Scheme allows a user to create one set of sort groups to organize material (*Call it **Default Scheme***), and then make a completely different set of sort groups (*Call it **Night Scheme***). The system may switch between Default & Night schemes manually by a user or automatically employing the schedule manager. Scheme schedules may be a one-time event or re-occurring scheme at defined intervals (Daily, Weekly, Monthly, 1st of the Month, etc.). Information displayed in the green box is the current sort scheme in use as well as the next scheduled scheme change. The red box is where the Scheme schedule manager is configured. The blue box allows users to create and organize alternate sort schemes.



4.1.10.1 USING THE SORT SCHEME CONFIGURATION

The Sort Scheme Configuration is used to create alternate sort bin organizations.



Available Sort Schemes: Provides a list of schemes created and available for use by library staff.

Add/Remove Scheme Buttons: Use these two buttons to Add or Remove a Sort Scheme. Pressing the 'Add New Scheme' button creates a new scheme in the column. The new scheme's name may be changed in the 'Name' text box. To remove a scheme, click on one in the available column & press the 'Remove Scheme' button.

Name: Use the text box to give the new scheme a label and tick boxes to select whether the scheme will be 'Active" or the "Default' sort scheme. Only one scheme may be chosen as the "Default" Sort Scheme. Once determined, all other schemes will be greyed-out, so they can't be selected as Default. The 'Active' tick box can be checked or un-checked as needed. A check mark means it can be used by the scheduler. No check mark indicates a non-active scheme. It is not available for use by the system.

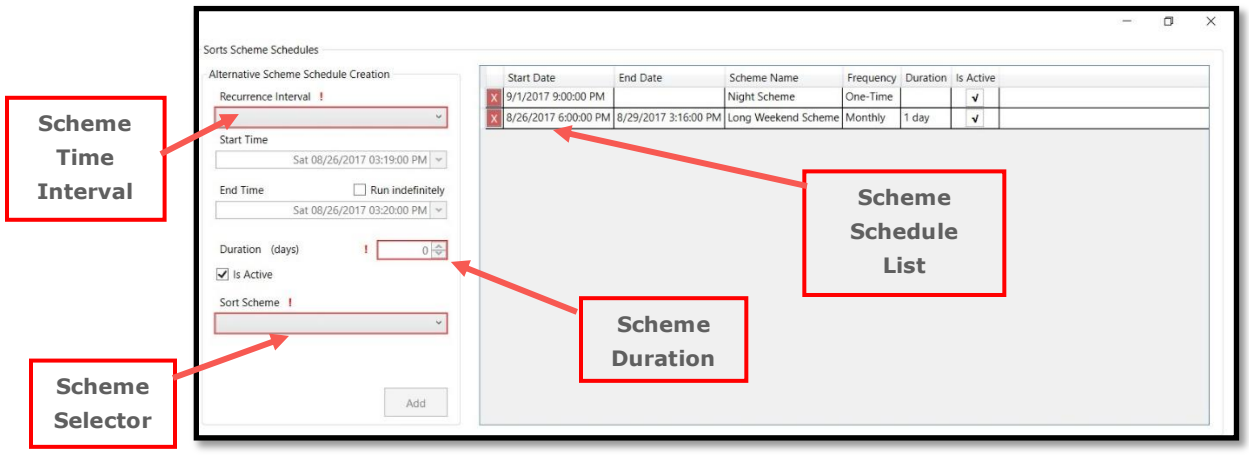
Sort Bin Group Selection - New Scheme: Highlighting a scheme in the available column displays a list of sort zones for the system sorter. Each sort has a drop-down arrow to allow the user to select a Sort Group from the list of available groups created in the Rules Window. If a Sort Group is not found in the drop-down list, it must be configured first using the Rules Window. Sort Rules may also need to be established for the new scheme.

NOTE: *Once a Sort Group has been used in the new scheme, the Group will be eliminated from the remaining drop-down lists so that it cannot be used again by another sort zone within the current scheme.* This will occur as each zone's Sort Group is selected.

4.1.10.2 USING THE SORT SCHEME SCHEDULER

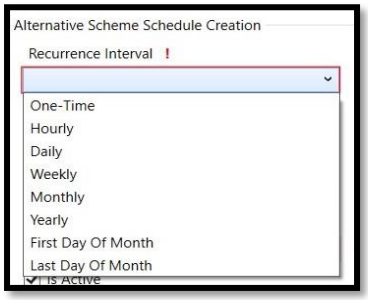
The Sort Scheme Scheduler is used to create activation schedules when the sorter will change its sort bin organization. The AMH system is designed to operate in its Default sort zone scheme until instructed to function otherwise. The Default sort scheme is typically the first/original sort scheme created. Alternate schemes are established to sort material differently than the Default mode. As an example, one library system uses Sort Schemes to fine-sort transit material to sister branches within their library system each evening. The 'Default' scheme allows for one (1) sort bin to collect all the transit material during the day. In the evening, the transit bin(s) are re-run to further sort material into groups of branches for additional sorting and distribution to their destination branch. Alternate Sort Schemes may be started manually or automatically using the schedule manager.

NOTE: *Please be careful when using the Sort Scheme feature. It takes great organization as well as coordination to manage schemes. At least one individual should be responsible for managing the process. What, when and how it is used by staff needs to be fully established and understood by all using the Sort Schemes capabilities. Remember, ALL bins must be cleared prior to switching sort schemes; as well as cleared again when moving back to the Default mode.*



SCHEDULE A SORT SCHEME START TIME

STEP 1: In the 'Recurrence Interval' box, click on the drop-down arrow to select desired occurrence option. See illustration to the right.

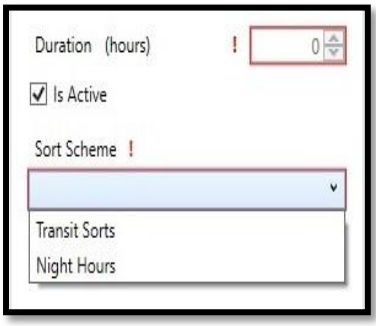


STEP 2: Enter a 'Start Time' in the text box. It may be entered manually or by clicking the drop-down arrow. A calendar will display to select the date. Always make sure to set or verify the time! Change hours, minutes and AM/PM manually.

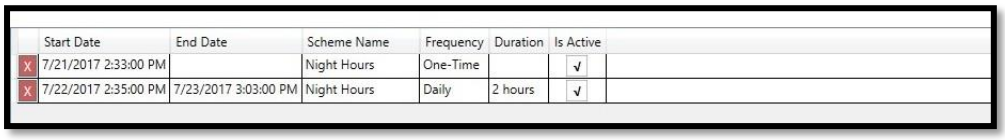
STEP 3: Chose an 'End Time'. One option is to check the 'Run Indefinitely' tick box. That signals the system to begin the Alternate Scheme at your designated 'Start Time' and continue in this scheme until changed manually by a user. Otherwise, an end time may be input using the down arrow to chose a date from the calendar and adjust the time to your liking.

STEP 4: Select a Duration timeline using the up/down arrows or enter a number of days. Use the tick box to determine if the specific scheme schedule created is Active or not. A check mark means the scheme is live and will be put into use by the sytem. No check mark means the timeline will not be implemented.

STEP 5: Use the drop down arrow to select the desired Sort Scheme assigned to the schedule being worked on. Before moving on to the next STEP, confirm the details entered.



STEP 6: Press the 'Add' button at the bottom of the column. This will insert the new schedule in the display table. All the relevant information associated with the scheme's timeline are present for review. See picture below for reference…

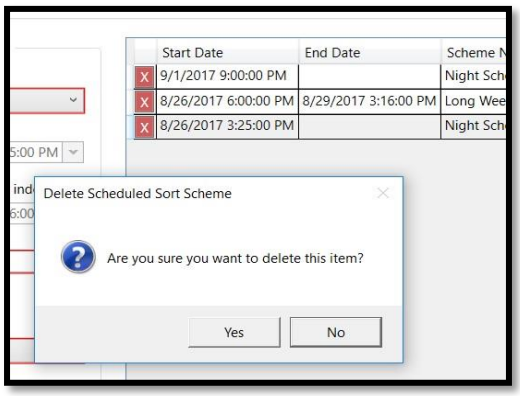


	Start Date	End Date	Scheme Name	Frequency	Duration	Is Active
X	7/21/2017 2:33:00 PM		Night Hours	One-Time		√
X	7/22/2017 2:35:00 PM	7/23/2017 3:03:00 PM	Night Hours	Daily	2 hours	√

DELETE A SORT SCHEME TIMELINE

STEP 1: In the timeline table, click on the red check box next to the scheme timeline you wish to remove.

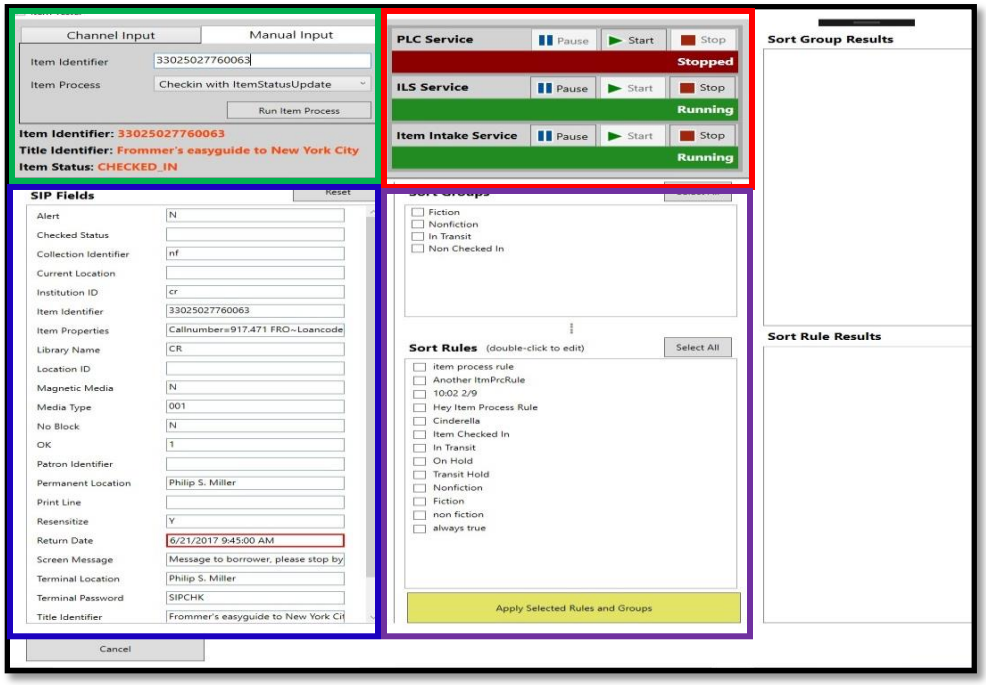
STEP 2: This will pop-up a window asking you to confirm its deletion. Hit 'Yes' if you wish to complete action. Press 'No' if you do not want to delete scheme timeline.



**** DO NOT FORGET TO PRESS THE 'SAVE & EXIT' BUTTON TO RETAIN CHANGES WHEN DONE!**

4.1.11 ITEM TESTER WINDOW

The 'Item Tester' window is a new screen in the EZ Sort software program. It allows a user to input am item ID, manually or via a RFID antenna/channel to view its returned ILS SIP Fields for the Checkin (09) SIP Message. A screen shot of the 'Item Tester' window show below. The green box is where item ID's are entered either manually or by and RFID antenna/channel. The red box is where the three (3) primary Services are controlled. In 'Item Tester' mode, the PLC Service does not have to be running. The blue box is where ID SIP Fields for the Item ID test will display once the SIP response is received form the ILS. The purple box is where the Item ID can be tested against Sort Groups and Rules on the system. The far column to the right is where the results are displayed. A green bar represents a true comparison, while a red bar means a false one.



4.1.11.1 USING THE ITEM TESTER WINDOW

The following is a description of how to use and interpret the various parts of the 'Item Tester' window. The primary purpose of the window is to decipher as well as understand the data being received from the Library ILS. It will be used frequently during the initial AMH installation phase or when issue arise with items/material checking in on the AMH system. This screen provides a user-friendly format to verify and uncover the raw data coming from the ILS. The other convenient feature of the 'Item Tester' window is the ability to verify items against sort rules and groups available on the AMH system.

INPUT AN ITEM ID INTO SYSTEM

Two options are available for testing items on the system. One is to enter the barcode manually into the 'Manual Input' tab. The other is to scan the item ID into the system using an RFID antenna/ channel. Steps to perform both are outlined below. Also discussed is the 'SIP Field' column. The data display is taken directly from the SIP (10) Check-in Response Message.

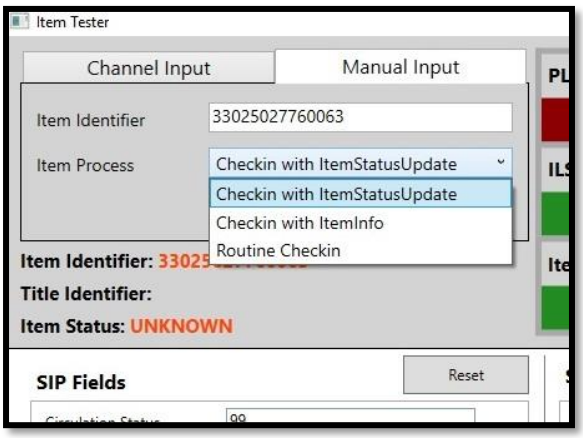
Before inputting an ID using the “Item Tester’ window, be sure to ‘Stop’ the PLC Service. The bar below will turn red similar to image to the right. The ILS and Item Intake Services MUST be in ‘Running’ mode. If they are not, ID’s will not be read and ILS communication cannot occur.

MANUAL ID INPUT:

STEP 1: Click on the ‘Manual Input’ tab at the top, right of the window. This will adjust the window view for manual ID entry.

STEP 2: Enter Item ID into text box. Double check ID to make correct number input. See red arrow to the right.

STEP 3: Click the drop-down arrow to select the ‘Item Process’ action to run for the ID listed.



STEP 4: Click the ‘Run Item Prcess’ button to send SIP request to Library ILS. The Item ID, Title Identifier and Item Status will display in red letters below in the grey shaded space. More importantly, all the SIP Fields received in the ILS response will display in the text boxes located in the ‘SIP Fields’ column on the left side of the Item Tester window.

CHANNEL/ANTENNA ID INPUT:

STEP 1: Click on the ‘Channel Input’ tab at the top, right of the window. This will adjust the window view for reading of the RFID tag in the item.

STEP 2: Click on the down arrow in the ‘Reader’ text box to select the corresponding RFID reader being used to read the item tag.

STEP 3: Click the drop-down arrow to select the RFID antenna/channel that will read the item tag.

STEP 4: Finally, set the item on the RFID antenna pad to read the item ID off the RFID tag. This will send SIP request to Library ILS. The Item ID, Title Identifier and Item Status will display in red letters below in the grey shaded space. More importantly, all the SIP Fields received in the ILS response will display in the text boxes located in the ‘SIP Fields’ column on the left side of the Item Tester window.

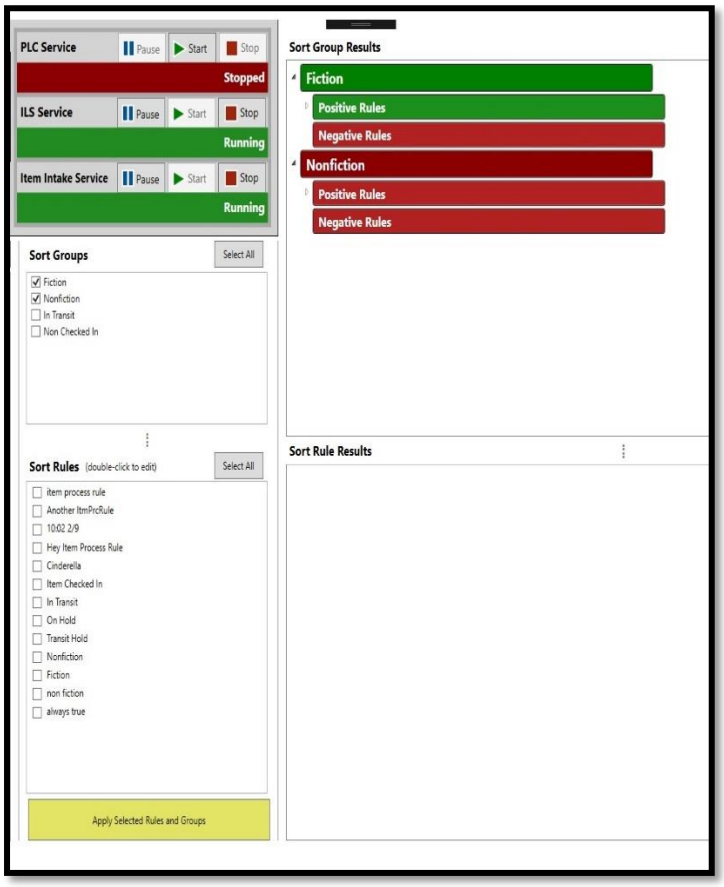
TESTING ITEM ID'S AGAINST SORT RULES & GROUPS:

Once an Item ID has been input and the SIP Field data displays, a user may test that item against the sort rules and groups available on the AMH system. The columns and tables shown below illustrate how to perform this functionality.

STEP 1: Start in the 'Sort Group' column and select the groups to test against. A check in the tick box means you desire to test the group. You may choose not to select any groups and only test rules.

STEP 2: In the 'Sort Rules' column, put a check mark in the tick box next to the sort rule to test against. You may choose not to select any rules and only test groups.

STEP 3: Finally, press the yellow 'Apply Selected Rules & Groups' button at the bottom of the column. The results will be displayed in the Results column of the screen.

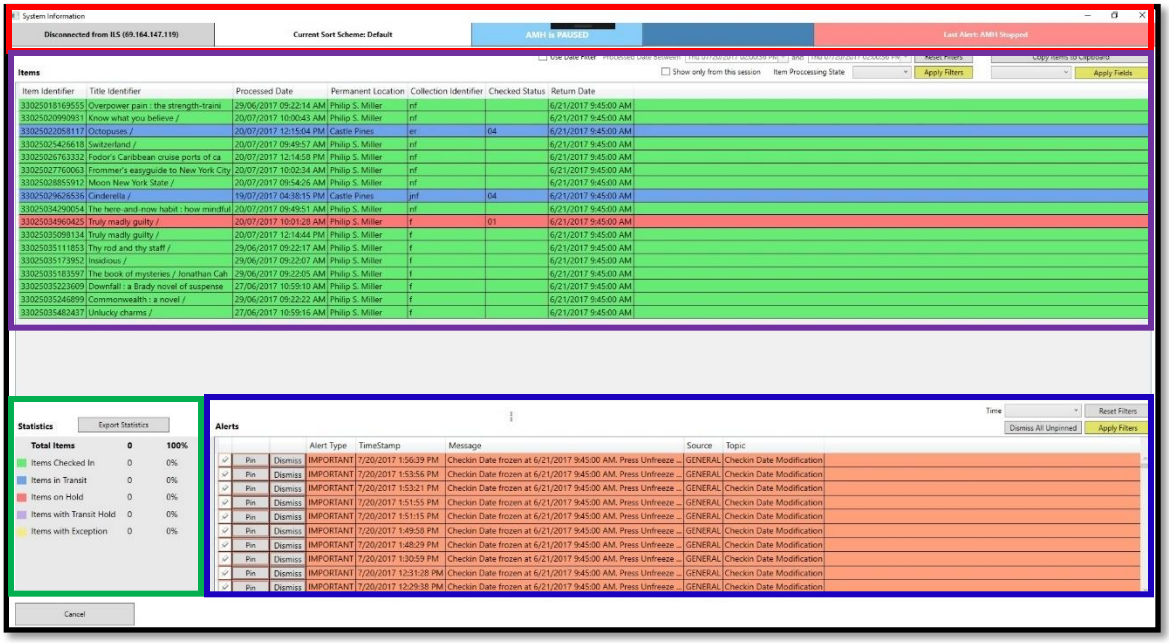


STEP 4: In the Results column, a user may click on the green and red rows to dive deeper into the Sort Group and Rule Results. A green row/result means a positve test result for the ID. A red row/result means a negative outcome compared to the rule or group.

4.1.12 SYSTEM INFORMATION WINDOW

The 'System Information' window is a hybrid of the old 'Item Information' & 'Alarms' shortcut screens. Beginning across the top row, this updated version displays the status for several key AMH processes using colored tabs. See the illustration on the next page, red box. They include the ILS connection, current sort scheme in use, system Running/Paused state & the Last System Alert. Similar to before, the window also provides a list of all the items processed through the sorter. See the central purple box in the picture at the top of the next page. As before, Items are color coded by type: Hold, Transit, Transit Hold, Checked-in or Exception. The column order may be re-arranged, show different fields and be used to organize/alphabetize columns as needed. General statistics are presented on the screen in the lower left corner. See the green box. The colors 'Checked in Status' coordinates with the 'Item Processed List' from above, and are the current totals/percentages for last hour. Finally, a list of recent alerts and system alarms is compiled on the window. The blue box in the lower right corner shows where to find them. This is where alarms that 'Pause' or stop the system will display. Alerts may be filtered by date. Individual Alerts may be dismissed or deleted from the list. Alerts may also be pinned to the list for reference in the future or spotting system trends.

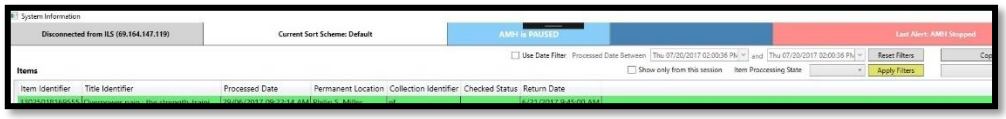
System Information Window



4.1.12.1 USING THE SYSTEM INFORMATION WINDOW

The following is an explanation of how to use and interpret the various parts of the 'System Information' window.

System Status Bar: Displays the status of key AMH system processes. They include the ILS connection (grey tab), current sort scheme in use (white tab), system Running/Paused state (blue tab) & the Last System Alert (red tab). See the illustration below. The status bar is for viewing only. Depending on the status shown in each tab, another window may need to be opened in order to change or fix whatever current state is displayed.



Item Processed List: Lists the material recently processed by the AMH system. Columns display various item information returned from the ILS check-in message response. The item status is color coded by type: green for item checked-in for shelving, red for 'Hold' at location, blue for a 'Transit' item, purple for a 'Transit Hold', and yellow for an item with an 'Exception'. Column order may be re-arranged. To do so, click the column header, hold and drag to new position in order. A single click on the column header will organize the item list by the that field. Column fields may be added or removed using the 'Filter' tabs.

USING THE FILTER TABS

The columns and information displayed in the list may be changed using the 'Filter' tabs shown below.

Use Date Filter box: Checking the tick box activates the start and end date boxes to the right. Use the down arrows to select the day & time in each date box, and then press the grey 'Reset Filters' button immediately to the right. The 'Item Processed List' will change to show all the items processed between the dates chosen. Uncheck the tick box and press the 'Reset Filter' button to return the list display to the current session.

Show only from this session box: Checking the tick box and pressing the 'Reset Filter' button will return the list display to the current session.

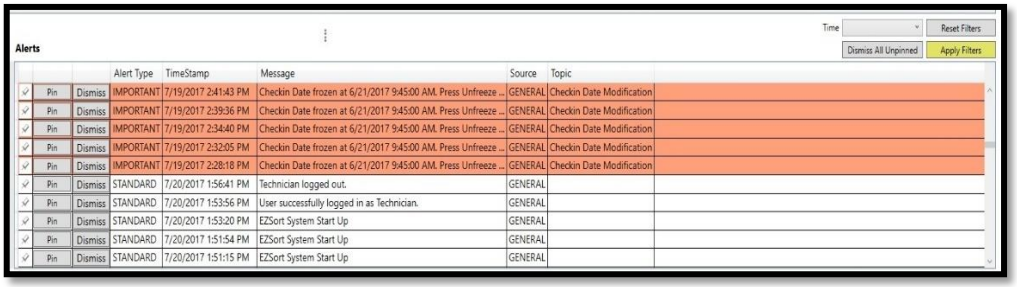
Item Processing State: Allows user to change the 'Items Processed List' to a list of choices from a drop-down menu. The choices include, sorted items, Holds, transits, Unknown or other type shown. Once selected, press the 'Apply Filters' button. To return to the current processed list, select the 'All' label form the drop down and hit 'Apply Filters'.

Copy Items to Clipboard: Clicking on this button will save the list of 'Items Processed' to a text file on the (C:) drive of the AMH CPU. It can be found in a file folder labeled RFIDLS.

SIP Fields Filters: The blank dropdown box is used to select which SIP message fields to display on the 'System Information' window. Clicking on the down arrow shows a dropdown list of SIP Field used by the AMH system. A check mark in the tick box next to the field name means that it will display in the table. Unchecking the box will remove the field from the list.

Statistics: Located in the lower left corner, the stats section presents the current system item count and percentage for the 'Checked Status' of each item type; Checked-in, Transit, Hold, Transit Hold & Exception. System statistics are based upon a per hour timer. The totals and percentages re-set at the top of each hour. User do have the ability to 'Export Statistics' to a Windows Excel file. The database beginning & end dates can user defined. The stats template displays material by day per hour The Reporting Statistics feature is covered in section 4.1.13 on the following pages.

Alerts: A very important user functionality and visual component. It displays an ongoing list of alarms that have occurred on the AMH system. The 'Alerts' fall into three (4) categories, Critical (red), Semi-critical (yellow), Important (salmon) and Standard (white). Each has a different effect or response level required. Besides providing the 'Alert Type', a 'Time Stamp, brief 'Message', system 'Source' and 'Topic' are given. Alerts may also be pinned or deleted from the dynamic list. Clicking on the grey 'Pin' button locks that particular alert to the list, while hitting the 'Dismiss' button removes the alert from the list. A confirmation box will display asking the user to confirm the "Alert's" removal.



Critical Alert: An alarm that pauses the AMH system. It could be a 'Sort Sensor Blocked', loss of ILS connection, RFID reader failure, lost PLC communication, or another sensor blockage type. These will require library staff to follow their training for each type of Critical Alert. In other words, the mechanical issue will have to dealt with first, and then the 'Alert' dismissed from the list. The system may also need to be returned to 'Auto' and 'Run' modes. In addition, do not forget to verify that all three primary services are running with a green bar. Please see Section 6.0 System Troubleshooting for instructions on how to clear common critical alarms. Critical alerts also trigger alert *emails* to be sent (if enabled).

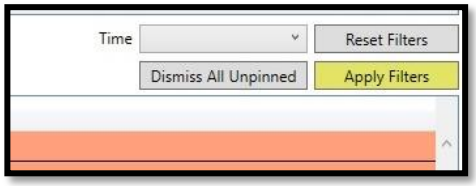
Semi-critical Alert: An alert that should warrant special attention but does not necessarily affect the immediate operation of the system. A common example would be reader device-related alerts (alerts indicating a reader connection was lost, but has reconnected, etc.) If multiple semi-critical alerts occur in a short period, please let an RFIDLS technician know.

Important Alert: An alarm that notifies the user of a change in system check-in or sorting process. It will not 'Pause' or stop the AMH system, but will definitely change when, where or how material is processed through the conveyors.

Standard Alert: Notifies the user of basic system activities. This might include a user login recognition or a Pause/Start of system conveyors.

USING ALERT FILTERS

To filter the 'Alerts' by a timeframe, click on the down arrow to select from the menu list. Press the 'Reset Filters' button to reset the Alerts List.



4.1.13 REPORTING AMH ACTIVITIES

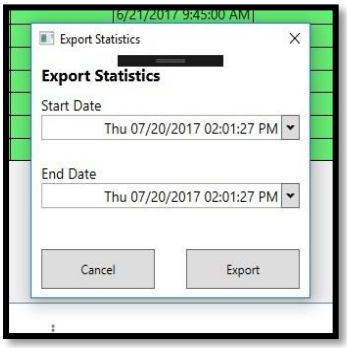
While operating, the EZ Sort software records various machine related occurrences and saves them to a retrievable database. The 'System Information' window provides the configuration of this reporting. When in administrative mode, it is possible to set the name and location of the statistics file as well as the frequency of the updating of the file. See section 5.5 for more information about configuring the statistics functionality.

EXPORTING SYSTEM STATISTICS

STEP 1: Open the 'System Information' window using the 'Windows' tab on the Main AMH Interface. In this window, lower left corner, is the Statistics reporting section for the system. See the illustration to the right.

STEP 2: Locate and press the 'Export Statistics' button. This will pop-up a secondary window to allow the user to configure the database to be pulled.

STEP 3: Select the 'Start Date' and 'End Date' for the requested stats. The date may be entered manually. Otherwise, click on the down arrow in each category to select the date from the calendar displayed, and then adjust the time to meet your desired start and end timeline. Se the table to the right for a visual reference.



STEP 4: A Windows OS 'Save as' screen will pop-up in order to save the exporting database in an 'Excel' file. Choose the location on the CPU, provide the file a name and click on the save button. The exported file can then be opened, copied or moved as needed. Below is a screenshot of what the stats file looks like.

LIBRARY: BRANCH Jan-17

From	To	Item Count	Item Rate	Checked In Count	Checked In Rate	Failed Check In Count	Failed Check In Rate	Exception Count	Exception Rate	Hold Count	Hold Rate	In Transit Count	In Transit Rate	Transit Hold Count	Transit Hold Rate	Multiple Tag at Sorter	Missed Tags at Sorter	No Tag at Sorter	Number of Items per Sort Zone: Sort 1	Sort 2	Sort 3	Sort 4	Sort 5	Sort 6	Sort 7	Sort 8	Sort 9	Sort 10	Sort 11	Sort 12	Sort 13	Sort 14	Sort 15	TOTAL
12:00 AM	1:00 AM	0	0.0	0	0.0%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0	0																0
1:00 AM	2:00 AM	0	0.0	0	0.0%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0	0																0
2:00 AM	3:00AM	0	0.0	0	0.0%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0	0																0
3:00AM	4:00 AM	0	0.0	0	0.0%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0	0																0
4:00 AM	5:00AM	0	0.0	0	0.0%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0	0																0
5:00AM	6:00 AM	0	0.0	0	0.0%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0	0																0
6:00 AM	7:00 AM	2	5.9	2	10000.0%	0	0.00%	0	0.00%	0	0.00%	1	5000.00%	0	0.00%	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1			2
7:00 AM	8:00 AM	22	25.1	22	10000.0%	0	0.00%	0	0.00%	0	0.00%	3	1363.64%	3	1363.64%	0	0	0	4	2	0	0	0	1	0	0	0	0	5	8	0	0	1	21
8:00 AM	9:00 AM	108	118.5	108	10000.0%	0	0.00%	0	0.00%	5	463.0%	17	1574.074%	8	740.74%	2	0	0	6	12	5	2	0	0	1	0	21	1	26	8	2	5	15	104
9:00 AM	10:00 AM	566	569.8	563	9947.0%	3	53.00%	3	53.00%	117	2067.138%	89	1572.44%	60	1060.07%	28	0	0	41	75	14	11	6	13	11	10	36	3	50	43	30	105	82	530
10:00 AM	11:00 AM	509	523.5	508	9980.4%	1	19.65%	1	19.65%	98	1925.344%	50	982.32%	84	1650.30%	44	0	0	40	52	30	8	4	3	7	3	83	4	50	29	12	87	216	628
11:00 AM	12:00 PM	582	584.0	581	9982.8%	1	17.182%	1	17.182%	157	2697.594%	37	635.739%	92	1580.76%	33	0	0	36	60	31	11	10	11	14	6	27	5	44	81	32	146	101	615
12:00 PM	1:00 PM	541	555.3	538	9944.5%	3	55.453%	3	55.453%	106	1959.335%	34	628.466%	36	665.43%	32	0	0	13	35	23	22	12	19	18	10	28	4	87	90	9	102	114	586
1:00 PM	2:00 PM	10	599.9	10	10000.0%	0	0.00%	0	0.00%	0	0.000%	1	1000.000%	1	1000.00%	0	0	0																0
2:00 PM	3:00 PM	513	513.1	508	9902.5%	5	97.47%	5	97.47%	30	584.795%	71	1384.016%	40	779.73%	25	0	0	31	49	20	13	9	11	14	4	59	49	78	92	17	29	111	586
3:00 PM	4:00 PM	528	528.7	527	9981.1%	1	18.94%	1	18.94%	144	2727.273%	57	1079.545%	87	1647.73%	30	0	0	40	70	24	8	14	9	9	17	10	10	46	55	17	97	91	517
4:00 PM	5:00 PM	450	450.1	448	9955.6%	2	44.444%	2	44.444%	89	1977.778%	44	977.778%	58	1288.89%	12	0	0	32	55	14	31	14	7	15	4	66	5	49	59	38	108	62	559
5:00 PM	6:00 PM	582	582.6	582	10000.0%	0	0.00%	0	0.00%	175	3006.873%	47	807.56%	44	756.01%	23	0	0	33	39	27	16	9	12	13	11	45	18	77	62	32	134	62	590
6:00 PM	7:00 PM	559	563.4	556	9946.3%	3	53.67%	3	53.67%	86	1538.461%	60	1073.35%	27	483.01%	22	0	0	15	27	25	20	11	18	13	19	52	23	99	76	29	105	73	605
7:00 PM	8:00 PM	282	283.6	282	10000.0%	0	0.00%	0	0.00%	16	567.38%	34	1205.67%	25	886.52%	4	0	0	26	36	19	7	11	6	7	5	12	7	99	84	14	29	24	386
8:00 PM	9:00 PM	130	132.1	130	10000.0%	0	0.00%	0	0.00%	8	615.38%	23	1769.231%	8	615.38%	3	0	0	10	19	5	6	6	2	11	7	22	3	26	24	16	10	18	185
9:00 PM	10:00 PM	102	104.2	102	10000.0%	0	0.00%	0	0.00%	6	588.24%	8	784.31%	10	980.39%	4	0	0	5	11	1	5	12	4	1	3	12	1	12	25	8	5	7	112
10:00 PM	11:00 PM	28	28.1	28	10000.0%	0	0.00%	0	0.00%	2	714.29%	5	1785.71%	6	2142.86%	0	0	0	3	3	2	1	0	0	0	0	0	1	2	9	1	2		24
11:00PM	12:00 AM	11	41.3	11	10000.0%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0	0	3	0	0	0	0	0	0	0	0	0	10	0	0	0	0	13
		5525	270.0 (Average)	5506	99.7% (Accuracy)	19	0.3% (Errors)	19	0.3%	1039	18.81%	581	10.52%	589	10.66%	262	0	0	339	545	240	161	118	116	134	99	473	134	760	745	258	964	977	6063

5.0 SYSTEM TROUBLESHOOTING

This section shows how to resolve common issues or 'Critical Alerts' that 'Pause' the AMH system. There is also a short 'Frequent Questions' page regarding the system use.

5.1 EMERGENCY STOP (E-STOP) PRESSED

Emergency stop buttons are accessible at multiple locations on the AMH system. Pictured to the right are two examples. The one with a red background plate is the most common and found on the grey transport conveyors, while the other is located on the system power panel as well as staff control pendant on the induction module. In the event of a dangerous or undesirable situation, press the nearest **RED button** to cut power to the entire AMH system.

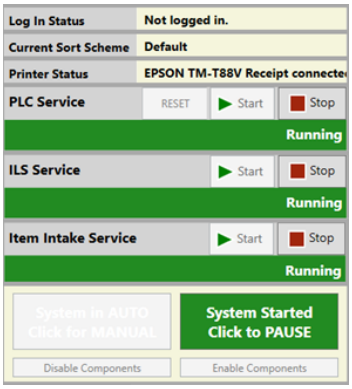
STEP 1. **Resolve any issue that led to pressing the E-stop button.**
It may be to clear a book jam, to remove an unwanted object from a conveyor or due to a mechanical problem. An issue that is beyond the Users ability or comfort level should be directed to RFID Library Solutions for resolution. Contact your technician directly or by calling toll free **(877) 924-7434**.

STEP 2. **Re-set the pressed E-stop button.**
An E-stop is reset by turning the red knob clockwise until you feel as well as hear the button 'Pop-out' back into its neutral position. A tripped E-stop is indicated by an illuminated red button. See picture above, left. If you do no recall which E-stop was pressed, check/re-set all red push-buttons on the system.

STEP 3. **Power up the system.**
To do this, locate the control panels, pictured right. The most left enclosure has three buttons, a red E-stop, a green start & a white power button. Press the white one (circled) until it illuminates indicating power is present. Remember, the power button will NOT light up if an E-stop remains depressed.

STEP 4. **Clear the system 'Alarms.'**
Return to the Staff Station PC to check the state of the system. On the monitor should be an 'Alerts' window, pictured to the right. Before the system can be placed into Automatic Run Mode, all alarms must first be cleared. To do so, click the 'Dismiss Alerts' label in upper right corner of screen. You can also click the 'Clear Alarms' button in the Status/Control column just below the yellow AUTO/START buttons.

STEP 5. **Place the system in Automatic & Run Mode.**
Prior to starting the conveyors again, reconfirm the machine is safe to operate & everyone is clear of system. Staying at the controller PC, use the two (2) yellow tabs pictured to the right to start the AMH system again.



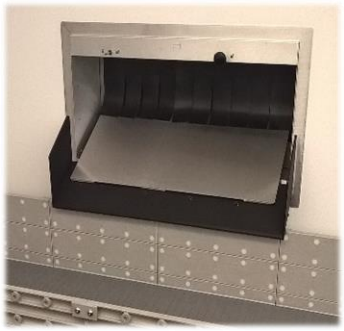
- ***Manual/AUTO mode*** *- With the system powered up, place the machine in AUTO mode by pressing the "System in Manual. Press for AUTO" button."*

- ***Pause/START*** *- With the system in AUTO mode, place it into START by pressing the "System Paused, Click to START" button. Upon start up, the AMH conveyors*

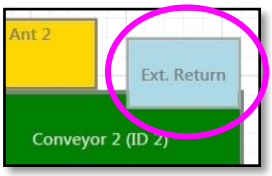
will begin to move, indicating the system has been activated.

5.2 BOOK DROP SENSOR BLOCKED

Every book return connected to the AMH system has a custom black transition attached that transfers material from the deposit chute onto a waiting in-feed conveyor. Embedded in the transition is a photo eye that detects the absence or presence of material as it passes. The picture to the right shows one type of transition installed, while the image below depicts where photo eye sensors are positioned.



An active sensor is indicated by a blue box on the main graphical user interface. An example is shown in the circle to the right. Each book drop sensor has a set time limit that alerts users when a sensor has been covered or blocked for too long. Typically, that time is 30-60 seconds.



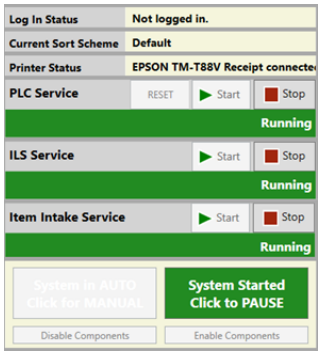
Once that time limit has been reached, the system will automatically 'Pause' itself. This action raises an alarm requiring intervention by a library staff member. The following steps will help clear an alarm for a blocked sensor at a book return.

STEP 1. **Clear any material from around the book drop sensors.**
Verify on 'Alarms' window that a book drop sensor is the cause of machine stoppage. A pop-up box with description line on main user interface will indicate this status. Use mouse to move alarms window to discover which book return is causing problems on main user interface. Many systems have more than one return connected. The light blue box will flash On & Off as well as turn purple in color. Proceed to book return so that material or whatever is blocking the sensor can be removed.

STEP 2. **Clear the system 'Alarms.'**
Return to the Staff Station PC to clear the alarms button. You may either click the 'Clear' button in the Alarm window that popped-up or press the 'Clear Alarms' button in the Status/Control column just below the yellow AUTO/START buttons. Both will re-set the system alarm mechanism to allow re-starting of conveyors.

STEP 3. **Place the system in Automatic Run Mode.**

Prior to starting the conveyors again, reconfirm the machine is safe to operate & everyone is clear of system. Staying at the controller PC, use the two (2) yellow tabs pictured to the right to start the AMH system again.



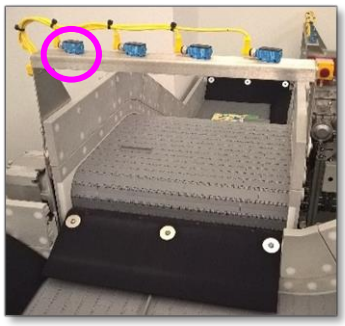
- **Manual/AUTO mode** - With the system powered up, place the machine in AUTO mode by pressing the *"System in Manual. Press for AUTO"* button."

- ***Pause/ START*** *- With the system in AUTO mode, place the machine in RUN bypressing the "System Paused, Press to START" button. Upon start up, the AMH conveyors will begin to move, indicating the system has been activated.*

NOTE: **A book drop sensor that continues to 'Alarm' w/out anything blocking the sensor….**

Refer to the following section, begin at STEP 3 by cleaning the sensors and area. Adjust photo eye(s) as needed in STEP 4.

5.3 CONVEYOR SENSOR BLOCKED

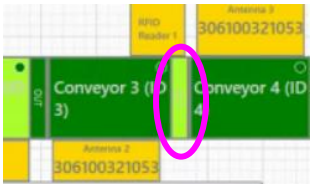


Each grey transport conveyor has a sensor bracket at its end to detect the presence or absence of material. Pictured to the right, it consists of a series of photo eyes that project red light beams down onto a black neoprene transition. This sensor net is used to control material flow onto the next conveyor.

A Conveyor Sensor Blockage may be triggered as a result of either a physical blockage, or one of the photo eyes misreading. In the event of a Conveyor Sensor Blocked alarm, it is possible to determine which conveyor is blocked by viewing the main AMH screen.

When blocked, the rectangle button representing the conveyor exit sensor will be flashing purple. Circled in the illustration to the lower right is where conveyor sensor indicators can be found. The sensor & alarm must be cleared before system operation may continue. Follow the steps below to resolve a Conveyor Sensor Alarm.

STEP 1. **Determine which sensor is blocked & error type?**
In the case of physical blockage, use the primary Users window to discover which conveyor sensor has triggered the alarm. Look for the small, skinny box flashing purple at the end of a conveyor. Conveyors are numbered in order from the first one in line all the way through to the sorter. See example to the right.



STEP 2. **Clear the material jam or remove the obstacle from conveyor.**
Often, the stoppage may be a patron receipt, a small children's book, or foreign object. You'd be surprised at what kids think is cute to put into a book return. Once the blockage is dealt with, return to the controller PC to clear the alarm. At this point it should then be possible to place the system into AUTO and RUN mode from a stopped state.

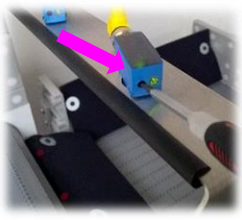
STEP 3. **In the event of a <u>MIS-READING</u> sensor, follow the next few measures...**
Examine the black neoprene transition below the suspected sensor bracket. Sometimes when the transition collects a lot of dust or debris it can cause the photo eyes to misread. First thing would be to clean the transition using the provided micro fiber cloth. We even recommend using the brush attachment on the vacuum hose to scrub the neoprene clean. A small portable vacuum can be found under one of the conveyors. Technicians use them extensively during annual maintenance visits. Attempt to re-start the sorter by clicking both yellow AUTO and RUN buttons on the User Interface.

STEP 4. **If procedure 3 fails, examine each blue photo eye on the sensor bracket.**
When a blue photo eye is 'Active' & working properly, a single green light will display on front side. See example to the right. This green "Go" or green is "Good" signal will allow the conveyor belt to correctly move material forward. When an item passes under a photo eye, an orange indicator light flashes on, pausing the conveyor. The orange light disappears once the item is moved away. The green light always stays on, while the orange light flashes on and off in sync with passing material. Look for a sensor with a continuous orange light and NO item below it. That's the culprit that needs adjustment.

Adjusting Sensor Sensitivity…

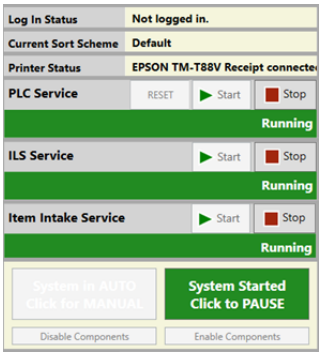
<u>Tool(s) Needed:</u>
Mini Screw Driver– Phillips style tip

<u>Activity:</u>
At the sensor bracket with the questionable photo eyes, locate the single adjustment screw. It's on the surface opposite the yellow cable. Using the screwdriver, turn the dial counter-clockwise until the orange light is turned off. Twist screwdriver in short, ¼ turn increments. The dial and LED emitter are VERY sensitive technologies so adjust carefully & slowly.



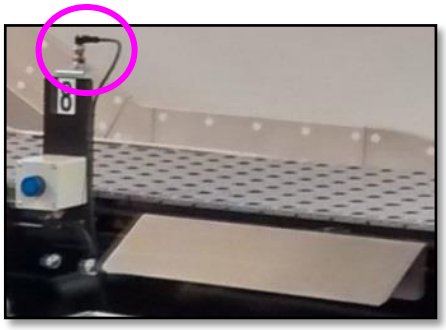
STEP 5. **With the sensor(s) adjusted the system may be restarted.**
Prior to starting the conveyors again, reconfirm the machine is safe to operate & everyone is clear of system. Staying at the controller PC, use the two (2) yellow tabs pictured to the right to start the AMH system again.

- ***Manual/AUTO mode*** *- With the system cleared, place the machine in AUTO mode by pressing the "System in Manual. Press for AUTO" button."*
- ***Pause/ START*** *- With the system in AUTO mode, place the machine in RUN by pressing the "System Paused. Press to START" button. Upon start up, the AMH conveyors will begin to move, indicating the system has been activated.*



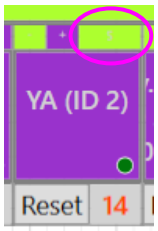
5.4 SORT SENSOR BLOCKED

Every sort zone on the large black conveyor has a sensor, circled to the right is its location. Along with the sensor are a blue push-button, a metal chute, a zone number and a piece of white/silver reflective tape.



In the event of a blocked Sort Sensor alarm, it may be possible to determine which conveyor sensor is causing trouble by viewing the main AMH screen. When blocked, the rectangle button representing the sort sensor, circled in illustration below & right, will change from light green to purple. A block sort sensor will cause the AMH system to switch into 'Pause' mode. The measures below will guide staff through fixing a sort sensor issue…

STEP 1. **Determine which sort sensor is blocked.**
Either visually examine each sensor zone or use the primary Users Interface to discover which sort sensor has triggered the alarm. Look for the small, square box flashing purple on the sort zones displayed below the sorter. Sorts are numbered in order from the first, all the way through to the Exceptions bin. See illustration to the right. Use AMH Interface screen or visually examine each sensor.



STEP 2. **Remove obstacle or clear jam at sort zone.**
In the case of physical blockage, for instance books backing up on the chute or a small piece of paper under the sensor, remove the obstacle & clear the alarm on the 'Alarms' window. It should then be possible to place the system into run mode from its paused state.

STEP 3. **Verify that Reflective Tape is securely attached below sort photo eye.**
This silver, shiny tape is essential to the sensors correct operation. Look around area to see if it has been dislodged. If found, replace & ensure its secure attachment. It should then be possible to place the system into run mode from its paused state.

STEP 4. **In the event of a <u>MIS-READING</u> sensor, follow the next few measures…**
Examine the space below the suspected sort sensor. A lot of dust & debris can collect in the area which can cause the sensors to misread. Clean the sensor as well as the reflective tape below it. Attempt to restart the sorter by clearing the alarm and clicking into RUN mode.

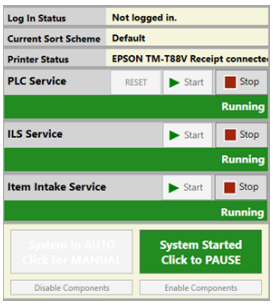
STEP 5. **If procedure 3 fails to resolve the alarm, it's time to adjust the sensor's sensitivity dial.**

<u>Tool(s) Needed:</u>
Mini Screw Driver–
Phillips style tip

<u>Activity:</u>
At the sensor bracket with the questionable photo eyes, locate the single adjustment screw. It's on the surface opposite the yellow cable. Using the screwdriver, turn the dial counter-clockwise until the orange light is turned off. Twist screwdriver in short, ¼ turn increments. The dial and LED emitter are VERY sensitive technologies – slower is better!

STEP 6. **With the sensor(s) adjusted the system may be restarted.**

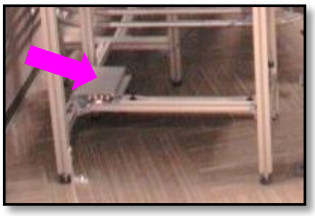
Prior to starting the conveyors again, reconfirm the machine is safe to operate & everyone is clear of system. Staying at the controller PC, use the two (2) yellow tabs pictured to the right to start the AMH system again.



- ***Manual/AUTO mode*** *- With the system cleared, place the machine in AUTO mode by pressing the "System in Manual. Press for AUTO" button."*
- ***Pause/ START*** *- With the machine in AUTO mode, place the machine in RUN by pressing the "System Paused. Press to START". Upon start up, the AMH conveyors will begin to move, indicating the system has been activated.*

5.5 TAGSYS RFID READER DEVICE FAILED

Location



Each AMH system has at least two, sometimes three RFID readers operating to detect RFID tags on the various conveyors. They are typically located below conveyors attached to legs or cross members. A TagSys reader in position is pictured to the right.

One is always positioned early in the system to check-in returned books, while another is at the short RFID sort conveyor before the sorter. A correctly functioning reader has flashing green & red lights on the face of the device (*circled in picture below to right*).

Failure

In the event of an RFID Reader (*TagSys Device*) alarm, it will be necessary to examine the actual reader to confirm its state. Typically, a TagSys Device Reader alarm occurs due to a loss of communications with the PC. This may happen because of a power loss to the device or entire system. If the Sort reader fails, **ALL** items will travel to the 'Exceptions' bin at the end, whereas a reader failure to the early one can only be detected through the 'Alarms' window. A TagSys Reader Device Failure will NOT pause the system. Staff will need to learn as well as recognize the signals given by the system.

STEP 1. **Put the AMH system into 'Pause' mode using yellow button in the right Status/Control column of Main User Interface.**

STEP 2. **Determine which RFID reader is NOT functioning.**

Use the main graphical screen to derive a general feel for the location of the readers under the conveyors. A reader is signified by a labeled yellow box – pictured right. Travel to approximate location on real system and look for the silver box w/ blue front. If green lights are flashing, reader is functioning okay. If no green lights are flashing, the reader is NOT working properly. It is **IMPORTANT** to note the Device No., either **1** or **2**.

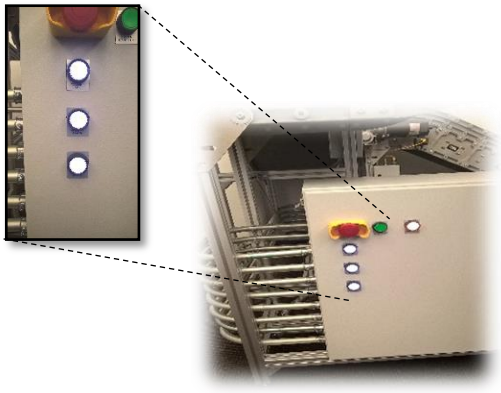
STEP 3. **Close down AMH software program by clicking on red 'X' in upper right corner.**

STEP 4. **Turn off power and restart the TagSys RFID device.**

Powering down a RFID reader is very simple. It only requires pressing a button.

Look for the three (3) large system control panels. While facing them, the enclosure on the left is the relevant one. A photo is to the right with a close up of where the power buttons are for each RFID reader on the system.

Turning power off is done by pressing in the correct reader push-button on the panel. The light will turn off signifying no power. Push the button again to re-start the reader. Each push-button is clearly labeled and corresponds to the physical as well as graphical location on the system. For instance, Reader Device 1 is typically positioned under the initial two conveyors. Reader Device 2 is under the



short RFID Sort conveyor and Reader 3 is on the staff station cart.

Allow a few seconds for the reader to re-boot itself. While this is happening, head back to the staff station to re-start AMH program.

STEP 5. **Activate RFID LS EZ Sort software by clicking on Sorter icon – pictured left.** With the system powered up, the user must place the machine in AUTO mode as well as click the software into RUN mode. Use mouse to click both yellow button on User Interface.

5.6 SYSTEM POWER OUTAGE/TOTAL POWER LOSS

If the library building has suffered a power outage or system power has been lost, it is necessary to **RE-ENABLE** the AMH conveyors before restarting the system. A loss of power to the system will be indicated by a couple key occurrences. Foremost, the blue sort lights will be flashing on/off. Although, if the building power remains Off, NO lights will be flashing. The white power light on the left control panel will also be OFF. If the controller PC is powered by the system, it will also be turned off. In this case, the AMH software will NOT be up & running. If the controller is plugged into a building wall outlet, the software might be up & running, but NOTHING will activate when the User clicks **AUTO** & **RUN** modes. To **ENABLE** the conveyors, follow these steps…

STEP 1. Power up the AMH System.

For the AMH system to operate, all the electrical components in the system must be powered up and enabled. Press and hold the white power button on the left control panel until the light illuminates.

STEP 2. Open RFID LS AMH software and Login at an Administrative User level.

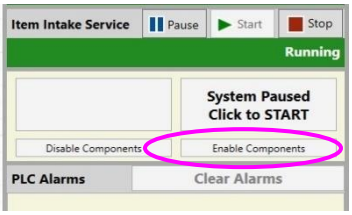
Open sorting software on controller PC. Once open, click on the 'FILE' menu located in the upper left corner of the AMH screen. Input the appropriate User name and Password to access Administrator mode.

STEP 3. Start the 'PLC Service.

Click the 'Start' tab in the 'PLC Service' on the Status/Control Column. It must be in a green 'Running' state to enable system components.

STEP 4. Click the 'Enable Components' button to engage ALL conveyors.

Click on the "Enable Components" button in the Status/Control Column located below the yellow AUTO/START buttons. See the circle in the illustration to the right.



STEP 5. Log out of Administrator mode.

Click on the FILE menu again in the upper left corner of the AMH screen. In the drop-down menu, click on 'Logout' to return to general user mode.

STEP 6. Clear System Alarms.

Prior to running the AMH system confirm with the computer that there are no Alarm conditions. This can be done by opening the 'System Information ' window and dismissing all alerts present at the bottom of the screen. It is possible for the machine controller to be in an alarm state without the alert being visible. This may occur if the PC and/or the AMH software was interrupted and shut down during the power loss. That's why it can be a good idea to click the 'Clear Alarms' button.

5.7 MECHANICAL FAILURE

Contact RFID Library Solutions in the event of a mechanical failure. For example, a plastic conveyor part breaks, part falls off machine, hardware component will not power up, etc.

You may call your technician directly using cell number or send an urgent email notice. Technician business cards are typically attached to each AMH staff station cart. Another option is to call our toll free number ***(877) 924-7434.***

5.8 EVERYDAY AMH QUESTIONS

1. *The system has stopped running with items still on it. What has happened?*

Occasionally the system will stop running with items still on the conveyors. Typically, this occurs when an item can't make it up an incline conveyor. This situation is normal, and because items are usually checked-in very quickly after being placed on the system, it should not be a major cause for concern. Another reason for items to be left on the system is as a result of an alarm that stops the system. If this occurs, resolve the alarm condition and restart the system and the items will be processed. Follow these steps to rectify the situation:

Check alarms	On the system PC, confirm there are no alarms present.
Clear alarms	Even if no alarms are present, it is always a good idea to press the 'Clear Alarms' button on the Main User Interface.
Place system into Run mode	Click on the Run/Pause mode button if the machine is Paused.

2. *I can't restart the system. What do I do now?*

There are many possible reasons that the system may not be able to be restarted, including loss of power, alarms, or loss of communications to the machine. To resolve these issues:

Check emergency stops	If any of the emergency stop buttons are pressed in, twist them clockwise to release the red button.
Check system power	If the white button is not illuminated on the left grey control panel, press & hold it to power on the system.
Check alarms	On the system PC, confirm there are no alarms present.
Clear alarms	Even if no alarms are present, it is always a good idea to press the 'Clear Alarms' button on the Main User Interface.
Enable the AMH	If there has been a power outage or the machine power has been turned off completely it will be necessary to re-enable the AMH.
Place system into Auto mode	Click on the Auto/Manual mode button if the machine is in Manual mode.
Place system into Run mode	Click on the Run/Pause mode button if the machine is Paused.

*****If all else fails, call RFID Library Solutions! (877) 924-7434***

3. *All the items are going to the end bin. What is wrong?*

This situation is caused either by a failure in the RFID tag reader at the sorter, or a failure in the SIP server computer communications. To resolve the issue:

Check the RFID reader nearest the Sorter	Verify that green (flashing) and red lights are ON. If not, shut down software as well as power down reader (unplug or switch), wait several seconds & power the device back on, in addition to re-staring AMH software.

Check 'Alarms' for SIP Communication Loss Error.	In the event of a SIP alarm, contact a supervisor, or the IT department to confirm Ethernet communications with the machine PC. Typically, a SIP alarm occurs when the connection between the PC and the library's server computer has been lost. The RFIDLS EZ Sort software will continue to attempt to reconnect with the server CPU.
Restart the AMH software	Make sure to put the system in 'Pause' mode before closing out the program. Red 'X' in upper right corner. Click on RFIDLS AMH icon located on the CPU Desktop window to restart software.

*****If all else fails, call RFID Library Solutions! (877) 924-7434***

4. *A conveyor is noisy? What can we do?*

After many months of use, dust build-up in motors can develop a screechy noise when a conveyor turns.

Motor brushes must be cleaned	The DC motors driving RFIDLS conveyors have two (2) small carbon blocks, call 'Brushes' that require cleaning after so many hours of operation. On each side of the blue motor casing is a small rectangular hatch. Some require a screwdriver to open, while other can be pried open with a flathead screwdriver. NOTE: Always E-stop system or shut off the conveyor's motor 'Breaker' before any service work is performed on a motor. Remove each hatch, watch carefully how the spring mechanism holds the brush in place, clean it thoroughly with a rag and place exactly as it was removed. If you are not comfortable performing the task, ask a more mechanically inclined staff member, or contact RFID LS.

*****If all else fails, call RFID Library Solutions! (877) 924-7434***

5. *The bin or tote inductor didn't dump all the items onto the conveyor. What has happened?*

The item induction modules have been designed to slowly meter items onto the conveyors. It is specifically programmed to only raise the bin floor or tip the tote while the attached conveyor is moving. Sometimes, if the system is very busy, the induction device will 'time out' and stop its process. Follow these steps when the inductor doesn't fully dump:

Restart the induction Process	Quick press the green button to re-initiate the module. If there are only a few items remaining, manual place them on the conveyor.
Re-center induction bin &/or push fully forward on tilting device	Specifically located proximity sensors are used to control hardware movements with the module, if they are not within a certain tolerance, they will not work correctly. Therefore, centering the bin on the tilter and fully engaging it forward to the cross tombstone is essential to the process.

*****If all else fails, call RFID Library Solutions! (877) 924-7434***