Bastian Solutions
Human Machine Interface
Owner's Guide

2020

Table of Contents

Table of Figures

1   Introduction

Bastian Solutions offers a Human Machine Interface (HMI) to keep you connected with your system. With high resolution graphics, our intuitive HMI facilitates a user-friendly way to access real time information such as scanner and sorter statistics (if applicable), as well as allowing direct interaction and control of the conveyor system.

The HMIs feature rich 3-D renderings of the actual conveyor installation that are divided into logical areas such as shipping, receiving etc. Every conveyor in the system is mapped and color coded to allow easy comprehension of the current system status. On-screen alarms such as Emergency Stops and product jams are indicated at their precise location, allowing system operators to easily reset such faults.

For larger and complex systems, options such as client-server-based installations provide scalability to the system, allowing multiple access points to the conveyor system throughout the plant floor. Take our HMIs on the GO! with web / smartphone / tablet viewing capabilities, you can view your system from virtually anywhere in the world.

The following sections will provide in-depth information on the various parts of the HMI, navigation of screens, and details on the various features and options available.

1.1 HMI Master Control Stations

Figure 1 - 3 Screen and 1 Screen HMI Master Control Stations

2   Quick Start and Login Guide

To launch the HMI Client, double click the icon shown below. The icon will typically be named " <Customer Name> HMI".
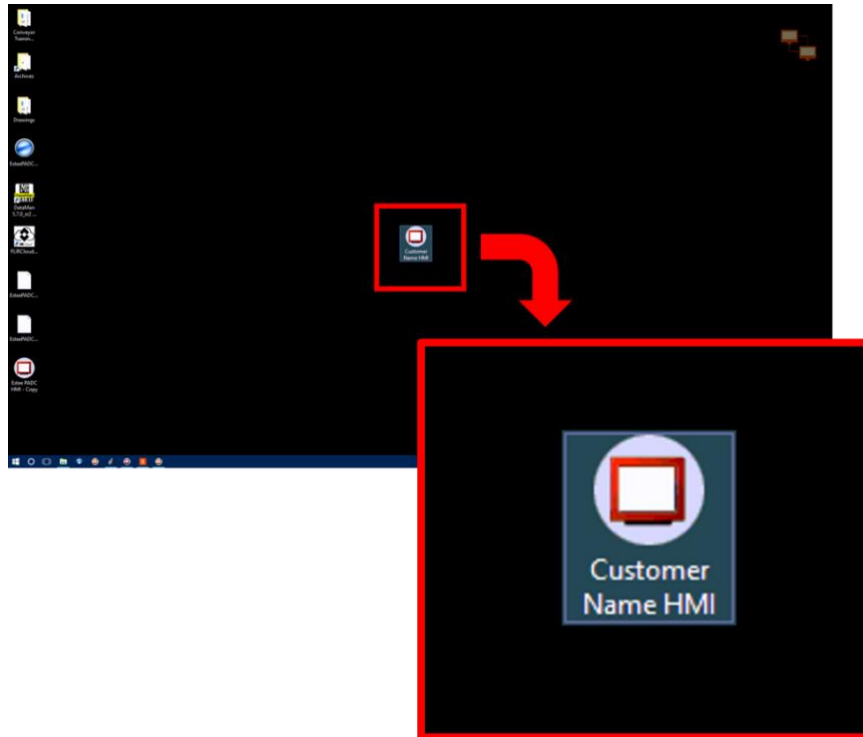
Figure 2 - Launch Icon

Upon launching the client, the system will begin loading the appropriate displays and services required. This may take a few minutes.
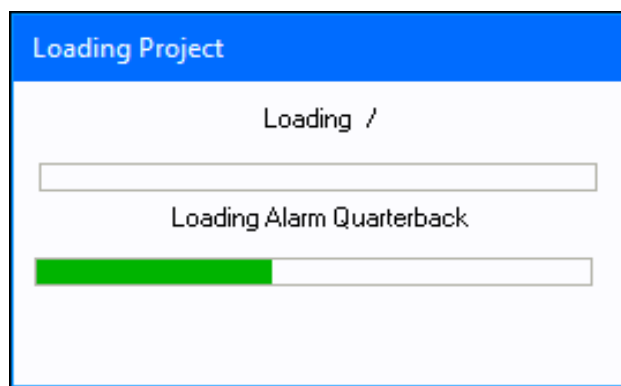
Figure 3 - System Loading Display

Once the client is launched, the user will be presented with the startup screen. When activated and if available, multiple users can be granted / denied access to certain critical portions of the HMI such as Maintenance modes, adjusting counters and timer values etc. These areas can be accessed by entering the appropriate credentials using the LOGIN LOGOUT buttons located on the startup screen at the bottom left hand corner as shown below. If security is activated, upon startup, the default or Standard user will automatically be logged in.

The current logged in user will be displayed on the side bar as indicated below.
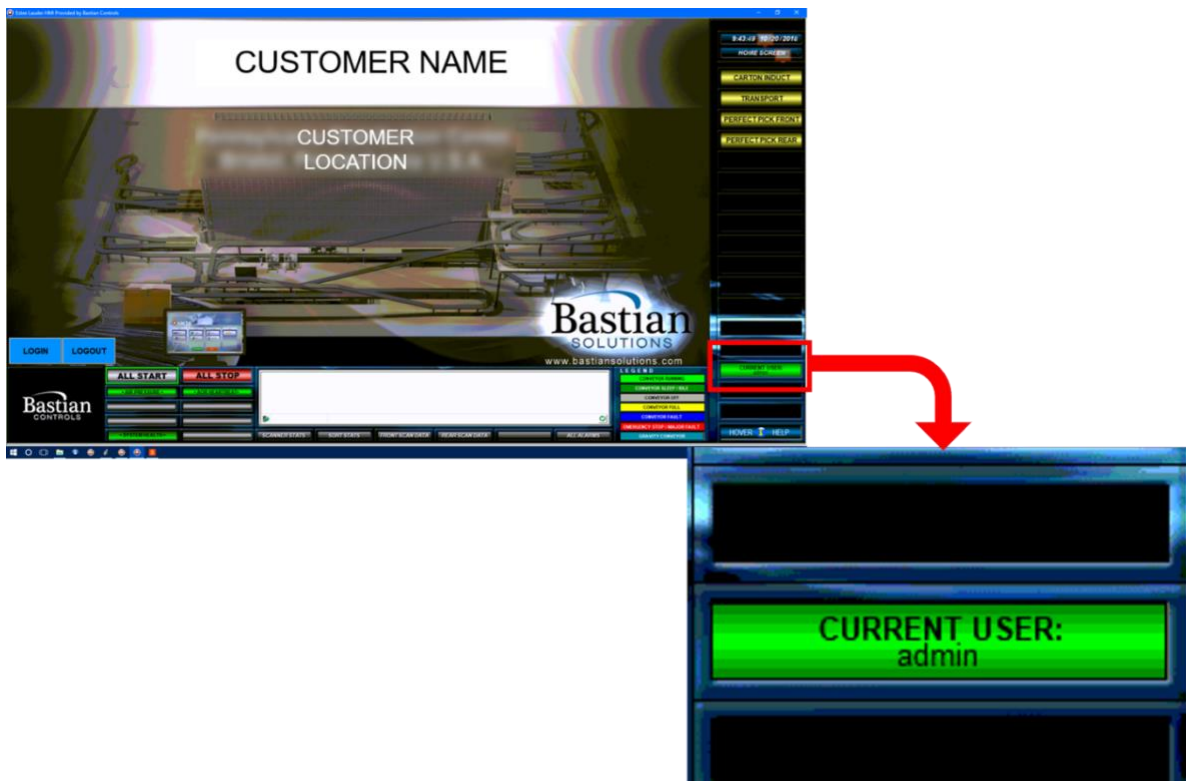
Figure 4 - Startup Screen and Current User Display

Figure 5 - Login Button

Click the login button to change the current user. Enter the user name and password for the appropriate user and then click OK.
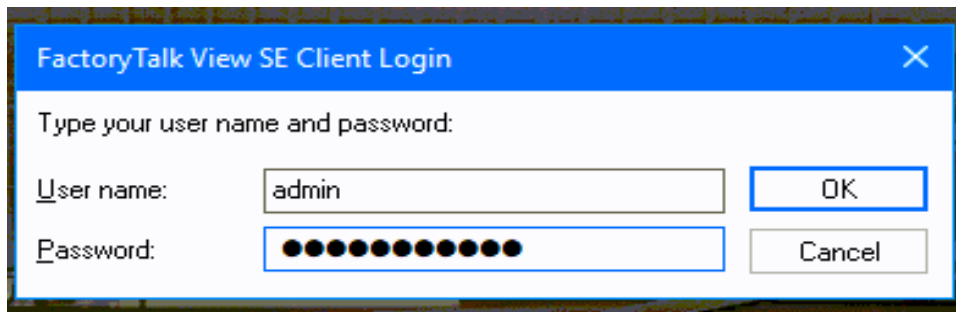
Figure 6 - User Name and Password Entry

If the credentials supplied are correct, the new user will be logged in and indicated on the side bar. The user will then have access to the screens and controls that he/she is configured for.

Pressing the Logout button will automatically logout the current user and login the standard / default user.
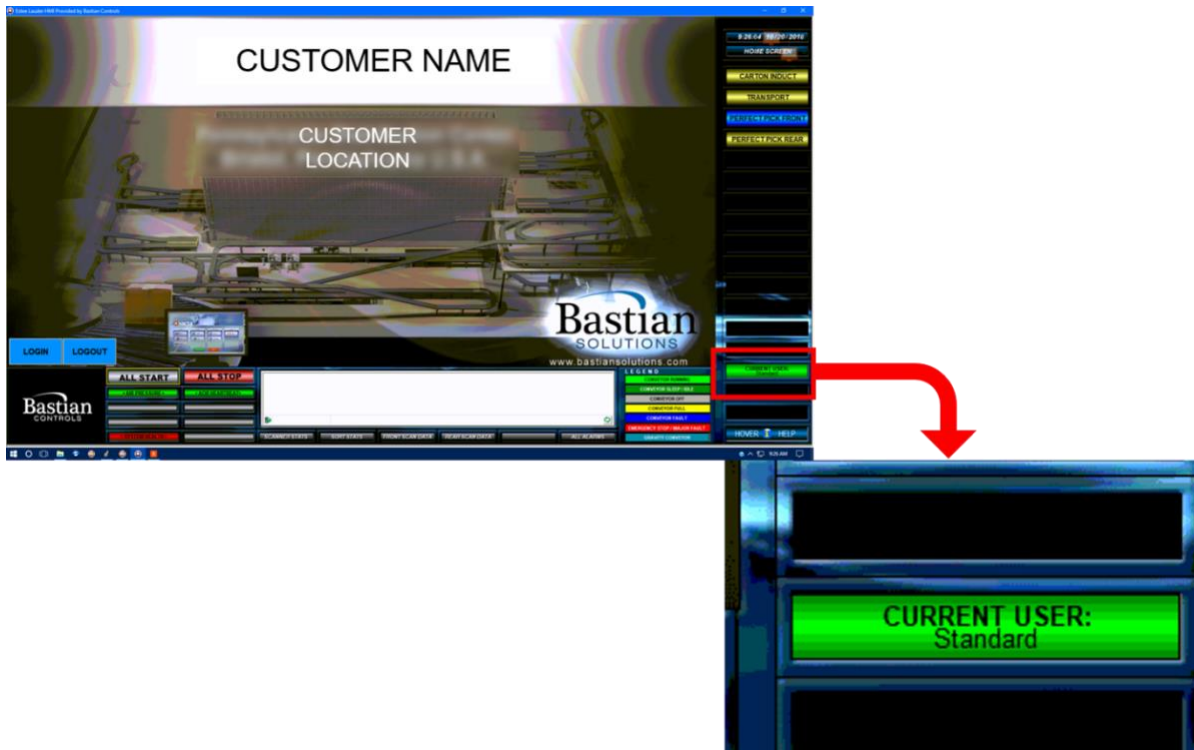
Figure 7 - Startup Screen and Standard / Default Current User Display

3   Basic HMI Navigation

3.1   HMI Window Overview

A typical Bastian Solutions HMI is navigated by mouse & cursor. Most sections of the HMI are readily accessible from anywhere within the HMI via a set of buttons that are visible at the side and across the bottom of the screen, regardless of which screen is currently loaded. An example of a typical HMI screen and its sections are described below in Figure 8 - HMI Main Window Example.
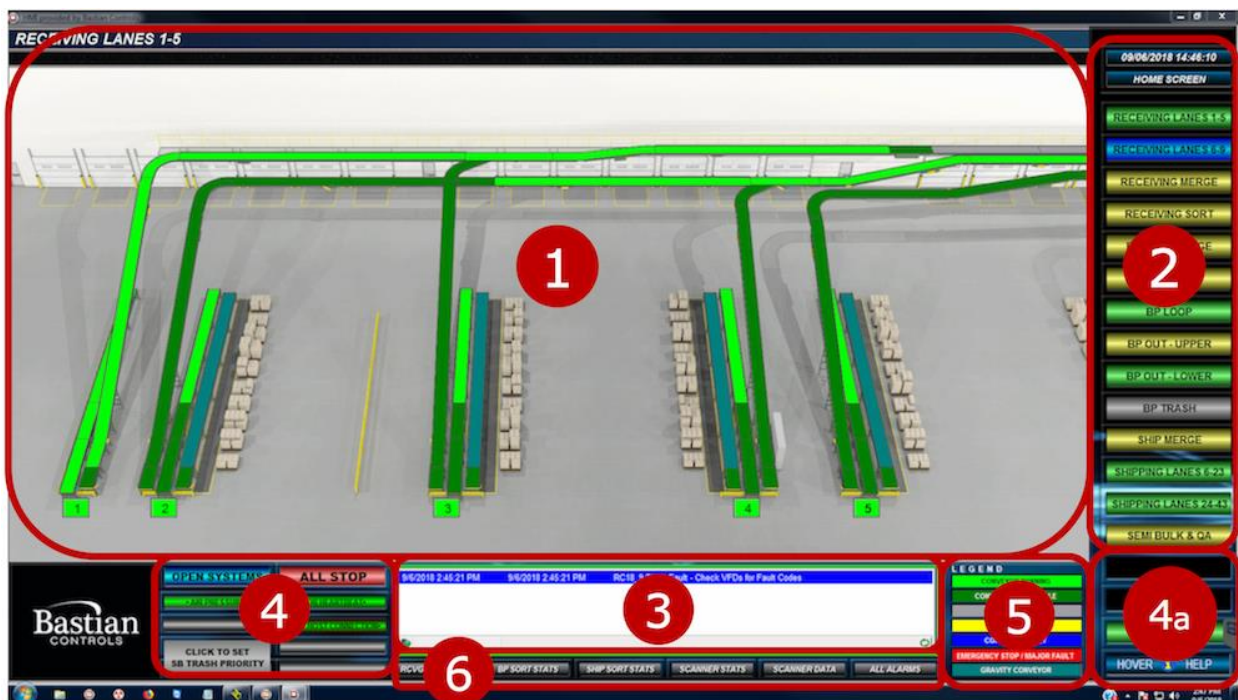
Figure 8 - HMI Main Window Example

1. **Main Window** – The Main Window is the largest section of an HMI screen. It typically shows a graphical representation of conveyors with color-coded status indicators and fault flags as in the above image, although it may also show system data screens or other custom screens specific to the individual project.

2. **Conveyor Screen Selectors** – The buttons visible down the right-hand side of the screen each represent a specific area of the system or section of conveyor. Clicking on any of these buttons will change the view in the main window to a graphical status display of the associated system section. These buttons retain their position and function

regardless of which conveyor or data screen is being viewed; however, they do change color based on the status of the conveyors in the area that the button is associated with. This color change allows an operator to quickly assess which areas of the system have faults, emergency stops, or have conveyors which are running or full.

3. **Alarm Window** – Centered on the screen directly below the Main Window is the Alarm Window. The five most recent, active alarms or warnings are displayed here sequentially with the date and time they occurred. Like the Conveyor Screen Selector side bar, the Alarm Window is visible regardless of what is displayed in the Main Window.

4. **System Faults** – Located immediately to the left of the Alarm Window, the System Faults window gives an overview of system-level status and faults, such as air pressure and communications with AOR (Automated Order Routing), where applicable. Typically, these indicators will all be green to indicate that the relevant status is OK (air pressure is good, AOR is responsive, etc.), but they will turn red if there is a fault in this area. This section also contains Start and Stop buttons, or access to the System Supervisor. With the exception of the Start and Stop buttons, these displays are read-only and do not perform any action when clicked.
    The System Faults display is also visible regardless of which screen is being viewed in the Main Window.
    a. For larger systems where there is not enough room to display the required statuses, additional displays may be added to the bottom of the Conveyor Screen Selector side bar, as in the above example.

5. **Legend** – Immediately to the right of the Alarm Window is a legend explaining the conveyor status color codes. Similar to the System Fault indicators, this is view-only, and clicking in this area will not result in any action from the HMI. The Legend will be visible regardless of which screen is being viewed in the Main Window.

6. **Data Screen Selectors** – Directly below the Alarm Window there may be one or more Data Screen Selectors. Clicking on these buttons will change the view on the main window to display important system data, such as scanner statistics, recent scan data, or sorter divert statistics. Data Screen Selectors will be visible regardless of which screen is being viewed in the Main Window.

3.2   System Supervisor

In place of the Start/Stop buttons in the System Faults display area, many larger systems will have a System Supervisor. Opening the System Supervisor will display a popup showing

individual Start and Stop buttons for independent systems (start/stop zones) within the overall system, as well as a short description, fault status and fault types present, and other information for each. The System Supervisor pops up as an overlay, which means it appears in front of but does not replace the screen visible in the Main Window. An example of a System Supervisor popup can be seen below in Figure 9 - HMI System Supervisor Example.
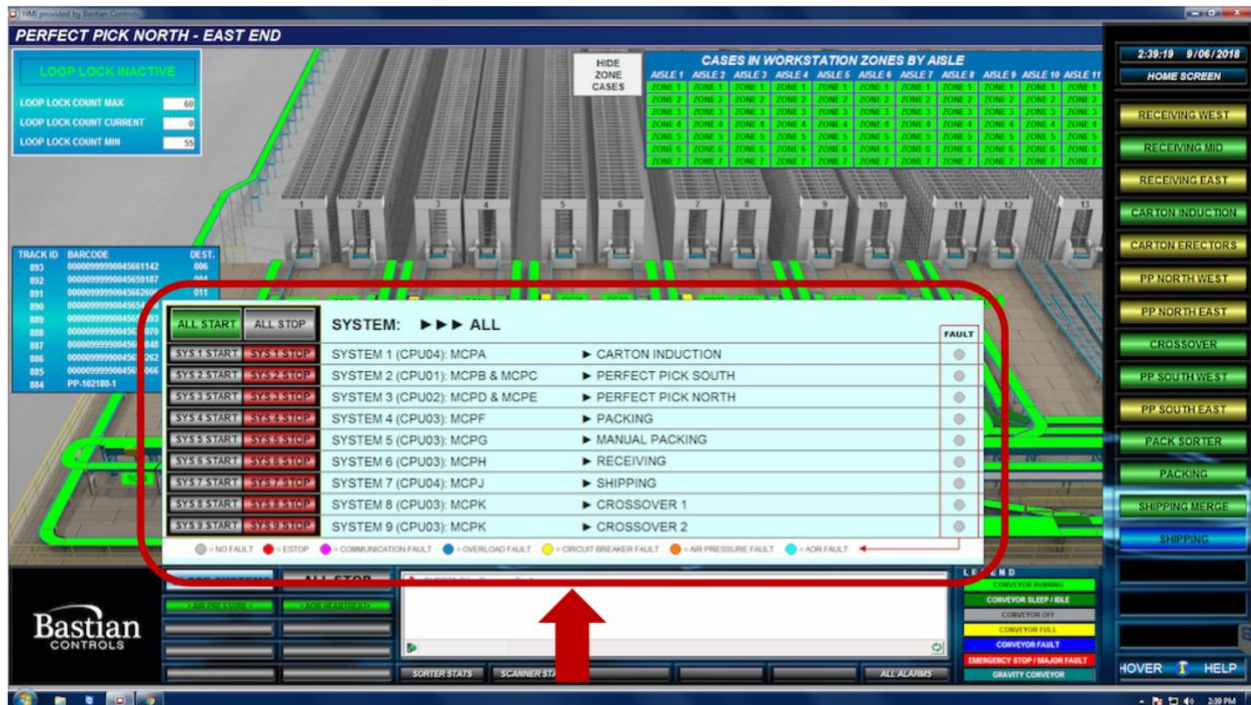
Figure 9 - HMI System Supervisor Example

The overall fault status of each system is shown using a color-coded "Fault" indicator. The color of this indicator tells an operator whether the system is faulted, and if so, the specific type of fault that is present. A legend at the bottom of the supervisor window explains the meaning of each color.

Clicking and holding any of the Start buttons will cause the Conveyor Control System (CCS) to attempt to start the conveyors in that section. Clicking once on any Stop button will cause the CCS to stop the conveyors and equipment in that section.

Above the individual system Start and Stop buttons in the System Supervisor are buttons to Stop or Start all systems at the same time. This is useful for the beginning or end of a shift, or when recovering from a major fault that affects multiple systems at the same time. Some faults

will prevent a system from being started until the fault has been cleared (i.e. an emergency stop, communication fault, or loss of air pressure). When holding down the All Start button, the CCS will attempt to start all systems but only the systems which are able to start will do so; the others will remain in their faulted/stopped state until the faults have been cleared and another start attempt is made (via an individual System Start or by using another All Start). See Quick Start and Login Guide for more information about system starts.

3.3 Conveyor Detail Screens

3.3.1 Interpreting the Graphics

When an area's Conveyor Detail Screen is opened by clicking the appropriate button on the Conveyor Screen Selector sidebar, the Main Window will show a graphical representation of that area. Each conveyor in the graphic is color-coded according to the Legend as seen in Figure 10 - HMI Legend.
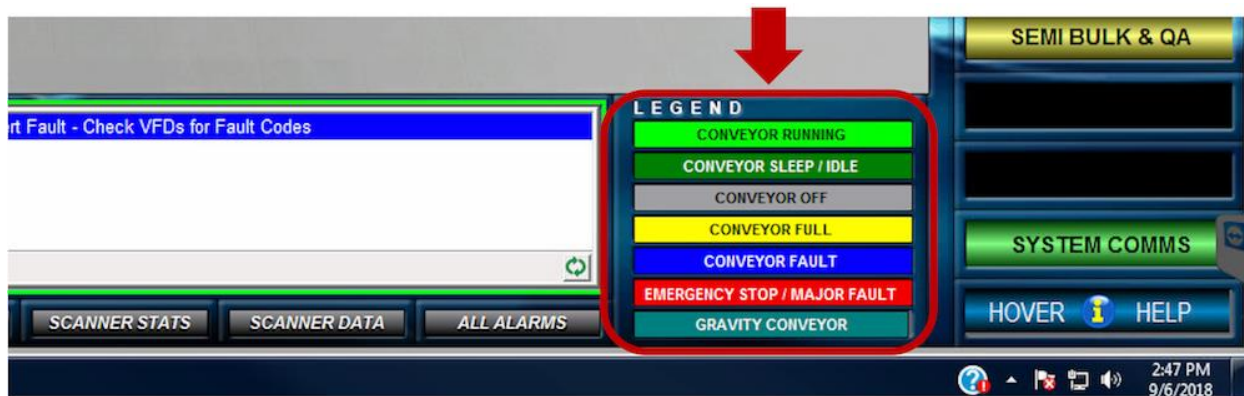
Figure 10 - HMI Legend

The colors in the legend are listed in ascending priority, and only the highest-priority color is displayed for each conveyor. For example, if a conveyor is full (yellow) but also faulted (blue), the fault status takes precedence over the full status and the conveyor will appear blue on the screen.

Certain types of faults (typically jams and emergency stops) are called out by a flag on the screen as in Figure 11 - E-Stop Flag Example and Figure 12 - Jam Flag Example. This alerts the operator as to where they should go to clear the fault condition prior to attempting to restart the system. In the case of a tripped e-stop pullcord, the pullcord is depicted along the length of the conveyor where it is physically positioned in the system, but the flag is shown at the end where the reset button can be found.
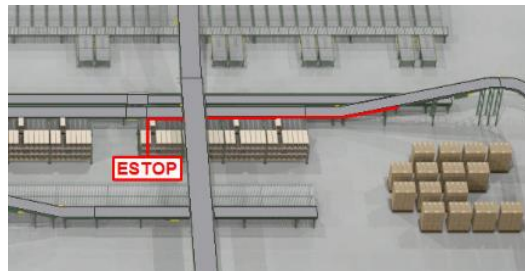
Figure 11 - E-Stop Flag Example
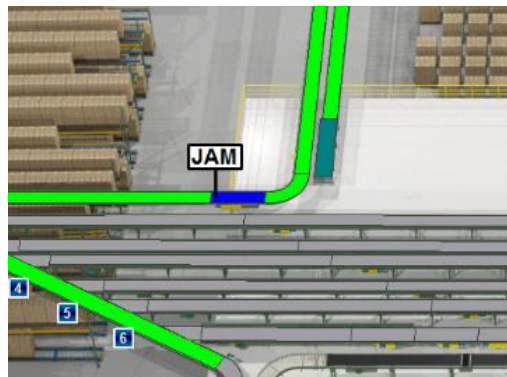
Figure 12 - Jam Flag Example

3.3.2 Conveyor Names/Identification

Upon holding the cursor over a specific conveyor on the screen, a tooltip will appear showing the name of that conveyor. This information can be especially useful when describing a situation to or preparing a report for maintenance, or when soliciting help from a Bastian Solutions support engineer or an on-site technician with troubleshooting an issue.
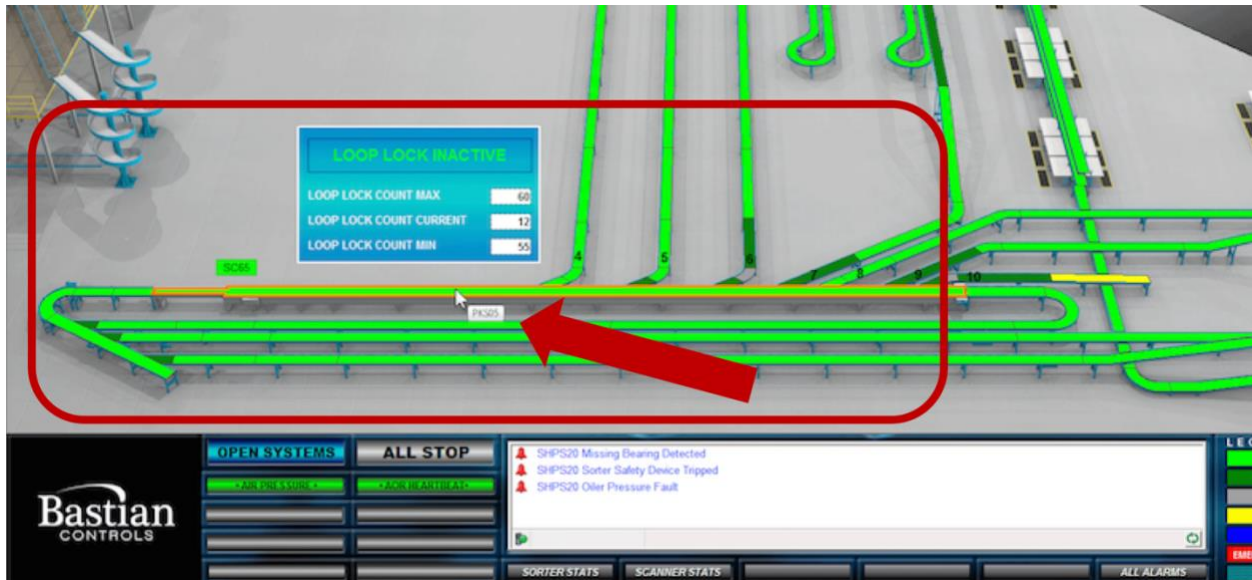
Figure 13 - Tooltip Conveyor ID Example

3.3.3 Ancillary Equipment Status

Many automation systems contain additional equipment, often from a 3rd party supplier, that interfaces with the conveyors and the CCS. Some examples of such equipment are barcode scanners, scales, dimensioners, or Print and Applies (commonly referred to as P&As or PANDAs). This equipment is shown in its correct position on the conveyor detail screen but does not typically change color the way the conveyors do. Instead, these objects will often have a button nearby to display/hide a popup with custom status updates, I/O values, or recently recorded results/data for that particular device. For more information on these Ancillary Equipment status displays, see Custom HMI Features**.**

3.3.4 Hover Help

For newer operators learning how to navigate and becoming familiar with the features of the HMI, there is a tool called Hover Help. Clicking the Hover Help button (Figure 14) will enable this feature. When the feature is enabled, the blue "i" icon will appear over areas or buttons which have Hover Help descriptions available. Holding the mouse over any of these icons will cause a tooltip to appear with a brief explanation of the feature and how it works.

Figure 14 - Hover Help Button

4 Alarms – How to interpret the messages

There are many different types of alarms in every system. As stated previously in this document, the alarms will be displayed in the alarm window near the bottom section of the HMI; or on the main Alarms screen. The alarm messages displayed may display information or instructions on further actions required, or what to look for, to clear the alarm.

<u>Always</u> make sure it is safe and acceptable to clear any fault and restart the system before doing so.
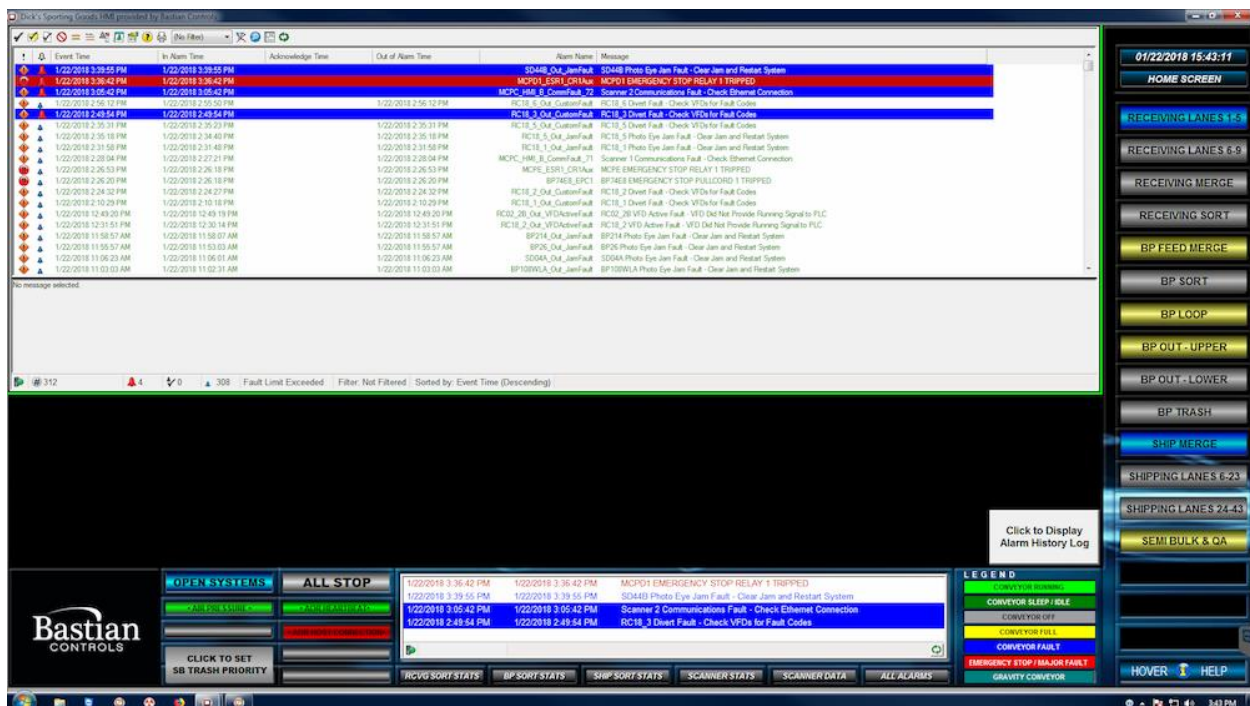
Figure 15 - Alarm Messages Display

Examples of these alarm messages and their explanations are as follows:

Alarm: *ConveyorID* Photo Eye Jam Fault – Clear Jam and Restart System
- o As the message states, clear the jam and restart the system. But in the case where there are no boxes/totes jammed up on the conveyor, perhaps there is a photo eye out of alignment or blocked in another way. Check to make sure the lights on the photo eye are lit up as they should be. You may need to check another photo eye that is lined up correctly for the appropriate lighting. Jams can also occur with transfers.

Alarm: *ConveyorID* **Motor Overload Fault – Check** *Panel* **for Tripped Overload**
  - o ***Resetting this fault should only be performed by maintenance or a licensed electrician, as it requires getting inside the electrical panel.*
  - o A tripped motor overload inside the panel needs to be reset.

Alarm: *ConveyorID* **Welded Contact Fault – Check** *Panel* **for Stuck Motor Contact**
  - o ***Resetting this fault should only be performed by maintenance or a licensed electrician, as it requires getting inside the electrical panel.*
  - o Sometimes a motor contactor can become electrically "welded" or stuck in the "On" position. This contactor may need to be replaced.

Alarm: *ConveyorID* **IOP Power Supply Fault**
  - o Certain types of conveyor (like Hytrol EZ Logic) may have a power supply for the zone controlling photo eyes on that conveyor. This power supply may get turned off or faulted, causing this alarm.

Alarm: *ConveyorID* **MDR Power Supply Fault**
  - o 24-volt powered conveyors will have a Motor Driven Roller with a power supply. This power supply may fault, causing this alarm. Cycling power to this power supply may reset the fault. If not, it may need to be replaced.

Alarm: *ConveyorID* **Motor VFD Fault – Check VFD for Fault Code**
  - o Some conveyor motors in your system may be controlled by a VFD (Variable Frequency Drive). If a VFD fault occurs, the VFD itself will display a fault code. Refer to the VFD manual for fault code explanations.

Alarm: *ConveyorID* **VFD Active Fault – VFD Did Not Provide Running Signal to PLC**
  - o The VFD has been told to run; but the VFD running signal is not being read by the PLC (Programmable Logic Controller).

Alarm: *ConveyorID* **VFD Load Loss Fault – No Load/Motor Detected. Check Motor Disconnect**
  - o The VFD turns on; but does not detect the motor running. The motor disconnect may be turned off. Turn on the motor disconnect if not locked out or being worked on by maintenance.

Alarm: *SpiralConveyorID* **Spiral Proximity Switch Fault – Check Drive and Idler Shaft Proxes**
  - o If your system has powered spiral conveyors, they may have proximity sensors that ensure the proper operation of the spiral belt.

Alarm: *SpiralConveyorID* **Spiral Tension Fault – Check Prox Sensors or for Excess Chain Slack**
- o Spiral conveyors may also have proximity sensors that ensure the proper tension of the chain that drives the belt. This alarm will occur if there is too much slack in the chain or belt.

Alarm: *MPA Circuit Breaker 1 Tripped* **– Check MPA for Tripped Circuit Breaker**
- o ***Resetting this fault should only be performed by maintenance or a licensed electrician, as it requires getting inside the electrical panel.*
- o A tripped circuit breaker inside the panel needs to be reset.

Alarm: *System 1 Air Supply Fault* **– Check Air Pressure and System Air Supply**
- o Several pieces of equipment in your system may rely on a compressed air supply to operate. Ensure that the air compressor system is running or that there is not a faulty air pressure sensor.

Alarm: *Device Name – Communication Fault* **– Check Ethernet Connection**
- o Examples of these devices may be a bar code scanner, a field box, or a VFD (Variable Frequency Drive). Check that all Ethernet connections for the device are securely in place at both ends.

Alarm: *AOR Heartbeat Fault* **– Ensure that AOR is Running**
- o AOR (Automated Order Routing) is software that keeps the product on your system going to its correct destination. If AOR is not running, or operating correctly, this fault will appear.

Alarm: *Scanner No Read Streak Fault* **– Check Scanner Health**
- o This fault will show up if a bar code scanner in the system has 5 or more consecutive "no reads" (product goes past the scanner, no bar code read). There are several reasons this fault could happen. Poor bar code quality, missing bar code labels, scanner movement, and failing scanner health are just a few.

Alarm: *Emergency Stop Pullcord Tripped* or *Emergency Stop Pushbutton Pressed*
- o Your system will contain Emergency Stop (ESTOP) pullcords and pushbuttons. If an ESTOP is active, a large portion of the system, or the entire system, will be shut down. The HMI will display the location of this ESTOP with a flag. Once the area is clear to run, you may reset this ESTOP and restart the system.

Alarm: *Emergency Stop Relay Tripped*

- o All of the ESTOPs, pullcords or pushbuttons, in the system are wired back to one or more Emergency Stop Relays inside the electrical panel(s). Anytime an ESTOP is active in the system, these relays will also have an active alarm. Sometimes these relays can detect an ESTOP has been partially tripped. In this case, an ESTOP flag may not appear on the HMI screen and will not trigger an alarm; but the relay will detect this ESTOP and the relay will alarm on its own.

Alarm: *TransferID* **Transfer Prox Fault**

- o This fault will occur when a proximity sensor is expected to be in a current state (on/off) and is not showing that state. The sensor may need to be adjusted or replaced if not working.

Alarm: *TransferID* **Transfer Timeout Fault**

- o This fault occurs when the transfer does not get to the required position in the desired amount of time. Something may be hindering the transfer from moving fluidly.

Alarm: *TransferID Servo Fault*

- o The servo motor which controls certain types of transfers has faulted and may need to be replaced.

Alarm: *TransferID* **Divert Home Fault**

- o The transfer is expected to be in the "Home" position; but is not showing the correct status. Might be due to a proximity sensor, similar to a Transfer Prox Fault.

Alarm: *Print and Apply Low Label Fault*

- o If your system has Print and Apply label application machines, this fault will occur when the label stock is running low.

Alarm: *Print and Apply Offline Fault*

- o Print and Apply is either turned off or the Ethernet cable is disconnected.

These may not be all of the faults that your particular system may contain; but these are the most common ones you may see on the HMI.
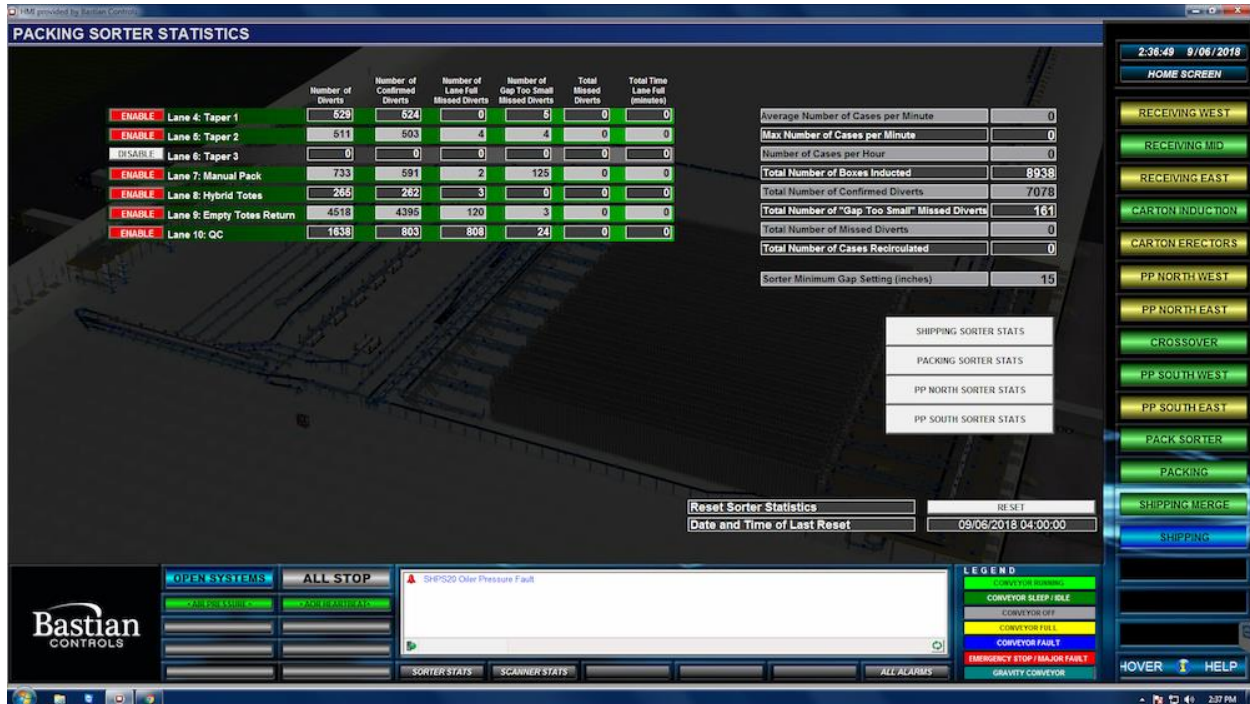
5   Custom HMI Features

5.1   Sorter Statistics

Figure 16 - Sorter Stats

5.1.1   Statistics Per Lane

- Number of Diverts: This metrics shows us the total number of packages which attempted to divert.

- Number of Confirmed Diverts: This metric shows the total number of packages that successfully diverted to that specific lane.

- Number of Lane Full Missed Diverts: This metric shows the total number of packages which did not get diverted to their destined location due to lane being unavailable.

- Number of Gap Too Small Missed Diverts: This metric shows the total number of packages which did not get diverted to their destined location due to the package being too close to another package; and had the potential to cause jam if a divert was attempted.

- Total Missed Diverts: This is the total number of packages which did not get diverted to their destined location.

- Total Time Lane Full (minutes): This metric shows us the total number of accumulated minutes for a specific sorter lane being full.

5.1.2 General Statistics

- Average Number of Cases per Minute: This is the throughput for the sorter.
- Max Number of Cases per Minute: Peak throughput achieved during the course of the day.
- Number of Cases per Hour: Throughput per hour on the sorter.
- Total Number of Boxes Inducted: This metric shows the total number of boxes inducted onto the sorter.
- Total Number of Confirmed Diverts: This is the total number of packages which got diverted to a destination.
- Total Number of "Gap Too Small" Missed Diverts: The total number of packages which did not get diverted to their set destination due to their proximity to another package.
- Total Number of Missed Diverts: This is total number of packages which went through the sorter but did not get diverted to any lane.
- Total Number of Cases Recirculated: This is the total number of packages which go through the recirculation loop.

5.2   Scanner Data

Figure 17 - Scanner Data

- Track ID: This is the identifier created by the PLC for a package. The PLC tracks the package with this number.
- Barcode: This is the barcode on the package read by the scanner.
- Destination: This is the set destination for the package communicated to the PLC by WMS.

5.3 Scanner Stats

Figure 18 - Scanner Stats

- **Number of Good Reads:** This is the total number of good reads by that scanner.
- **Number of No Reads:** This is the total number of packages where the scanner was unable to read the barcode.
- **No Read Streak:** This is the number of consecutive times the scanner was unable to read the barcode. If the scanner reads a barcode, this number is reset to zero (0).
- **Number of Double Reads:** This is the total number of times a scanner reads two or more barcodes on the same box.
- **Number of "No Data":** This is the total number of times a scanner was not able to decode the barcode in the given amount of time, thereby not giving any information to the PLC.
- **Good Read Percentage:** As the name suggests, it is the overall percentage of good reads by that specific scanner.

6 DVR Camera System

6.1 DVR Basics – Navigation Guide

The Lorex DVR systems default view shows the live feed of all camera's connected. A typical live feed screen is shown below.
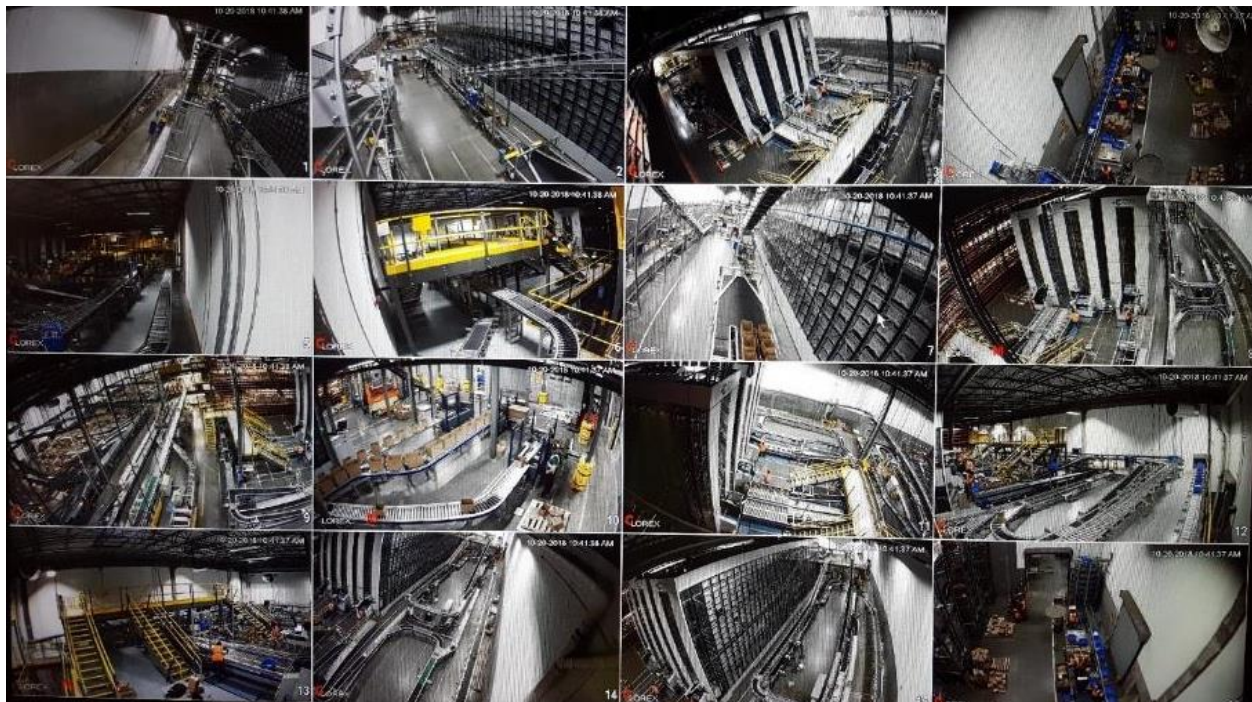

Figure 19 - Typical DVR Live Video Feed Screen

6.2   Logging In

Some areas of the DVR navigation may be restricted. To gain access, enter the user name and password in the fields provided when prompted.

The Default username is **admin** and password is 123456. An on-screen keyboard pops up when text / numeric entry is required.

Figure 20 - DVR System Login

6.3   Live Feed Menu

Users can change the number of cameras displayed using the procedure below.

1) Right clicking anywhere on the screen
2) When the pop menu appears, select the views desired
    a. View 1 – shows a single camera. User is required to select which camera feed to display.
    b. View 4 – Shows 4 cameras. User selects 1-4, 5-8 etc.
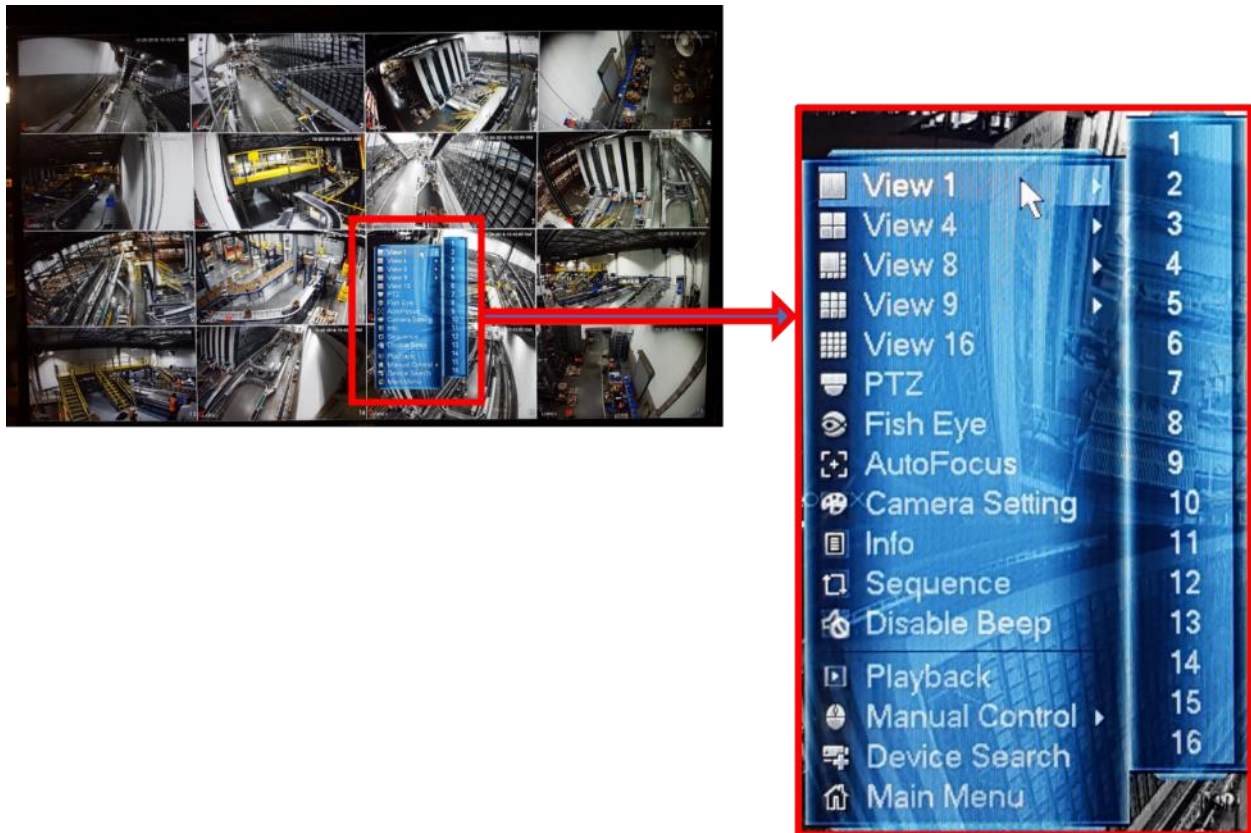   c. View 8, 9 – shows 8 or 9 cameras.
    d. View 16 – shows all the cameras

Figure 21 - Live Video Feed Menu

6.4   Viewing Recorded Video
There are 3 ways to access the recorded data:

6.4.1   Instant Playback
If a specific camera feed playback is required, hover the mouse close to the top of the selected camera. A popup menu will appear within the confines of that camera. Select instant playback.

The user can view the last 30 minutes of recorded data.
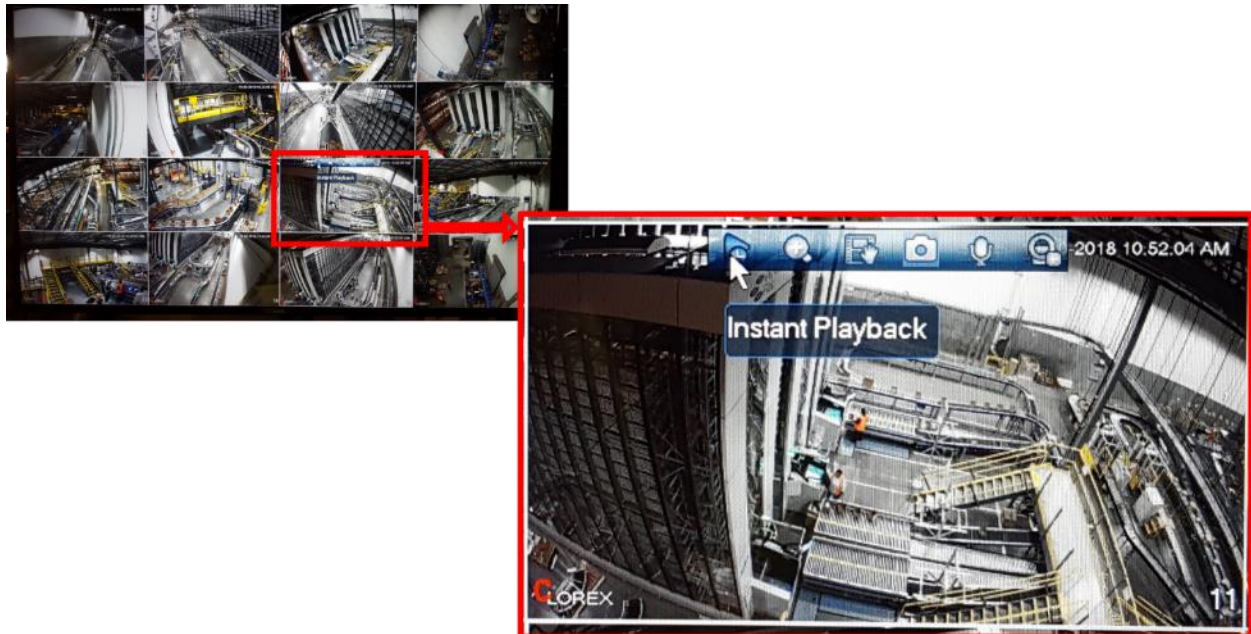

Figure 22 - Instant Video Playback

Synchronized Playback
Use the hover menu toward the bottom of the screen to access the quick playback menu.
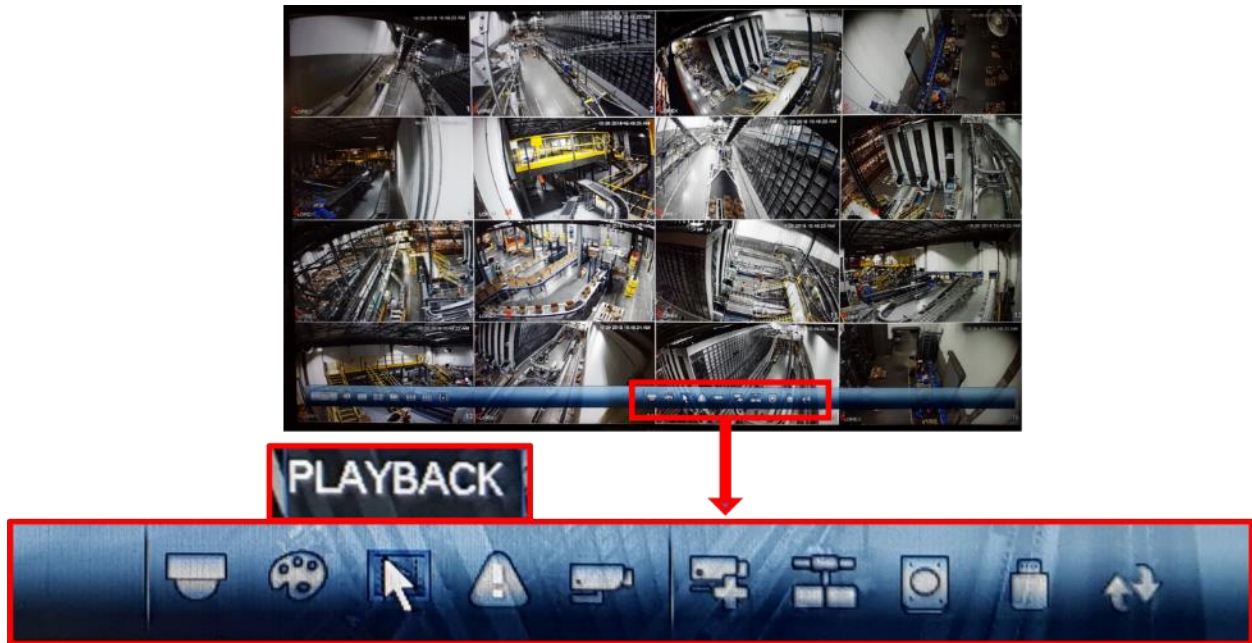

Figure 23 - Synchronized Video Playback

Right Click on Screen

Right click anywhere on the screen from the live feed view and select playback from the popup menu.
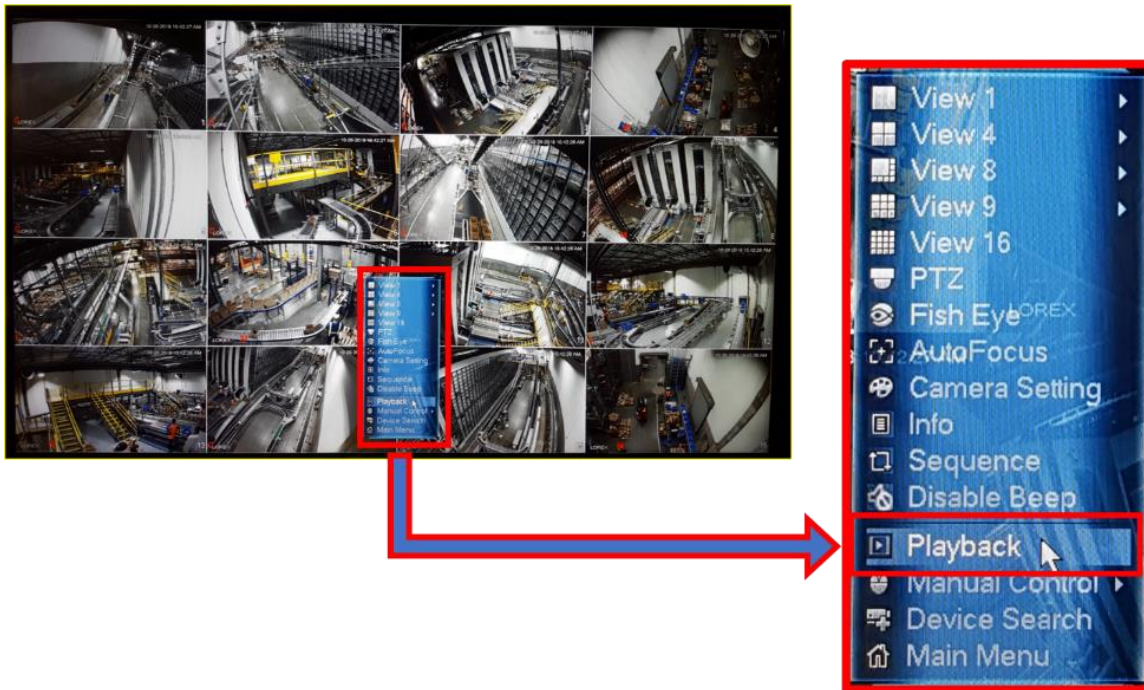

Figure 24 - Right Click for Video Playback Menu

Once the playback screen is displayed, users have the following options available:

- Date – select which date to view the recorded data. Depending on the size of hard disk and recording parameters, more or less days may be available for review
- Number of cameras – select which cameras to view
- Duration – changes the sensitivity of the scroll bar. Select between scrolling through 24hrs, 2hrs, 1hr and 30min
- Select Play to start viewing the recorded feed
- Select fast FWD to increase playback speed to 150%. Pressing fast FWD twice will increase the playback speed to 200%. Pressing it a third time will drop playback speed to 150%.
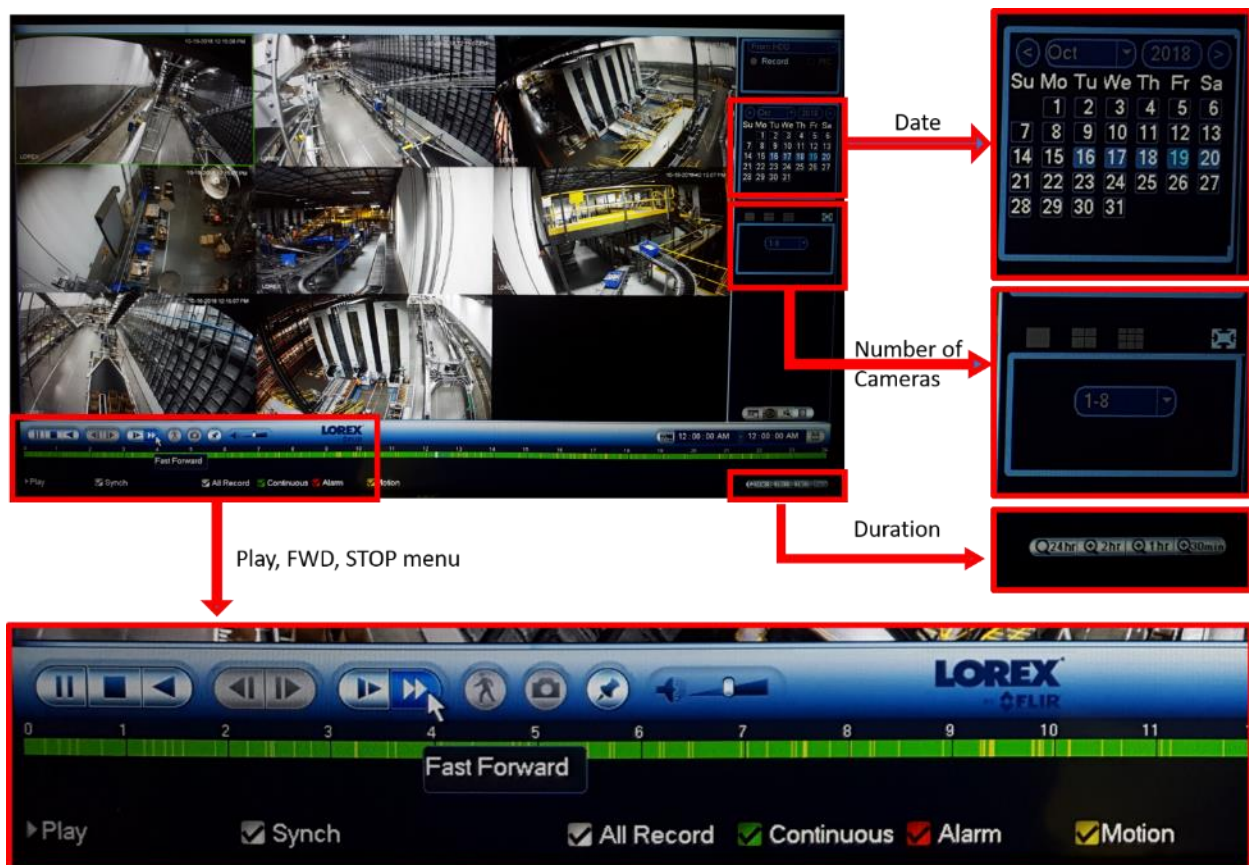- In this playback mode, all the selected camera playback will be synchronized

Figure 25 - Video Playback Options

7   Q&A – Troubleshooting Your System and HMI

Q: How do you start the whole system at the HMI?

A: Click on the "Open Systems" button and hold down the "All Start" button, in the pop-up window, for at least 5 seconds. *See Page 10* – Figure 8 - HMI Main Window Example *(Detail 4)*

Q: How do you start individual areas of the system?

A: Click on the "Open Systems" button and hold down the associated "Start System" button, in the pop-up window, for at least 5 seconds. *See Page 10* – Figure 8 - HMI Main Window Example *(Detail 4)*

Q: How do you stop the whole system?

A: Click on the "Open Systems" button and click on the "All Stop" button, in the pop-up window. *See Page 10* – Figure 8 - HMI Main Window Example *(Detail 4)*

Q: How do you navigate to different areas of the system to see more detail?

A: Click on the area selector buttons on the side bar, on the right side of the HMI screen. *See Page 10* – Figure 8 - HMI Main Window Example *(Detail 2)*

Q: How do you know where a fault condition exists in the system?

A: There are several ways to locate a fault condition:
- The area selector buttons on the side bar will change colors to indicate different conditions for the associated area, including faults.
- View the list of faults in the system at the bottom of the HMI page.
- On any area page, look for the conveyor colored to match fault locations.
- Look around the system for any stack lights showing their section of conveyor is at fault.

See Page 10 – Figure 8 - HMI Main Window Example *(Details 2, 3, 4 and 4a)*

Q: How do you see a list of past alarms?

A: Click on the "All Alarms" button on the bottom bar to display the full list of past alarms, as well as current alarms. *See Page 10* – Figure 8 - HMI Main Window Example *(Detail 6)*

Q: How do I know where a specific conveyor is located?

A: Use the Tooltip and the area name on top of the screen. *See Page 15* – Conveyor Names/Identification *and* Figure 13 - Tooltip Conveyor ID Example

Q: How do I see details of a particular alarm?

A: Go to the main alarm screen, choose a specific alarm in the list and the system will automatically populate the details area. *See Page 10* – Figure 8 - HMI Main Window Example *(Detail 3). See* Alarms – How to interpret the messages *and* Figure 15 - Alarm Messages Display

Q: How do I know if Estop has been reset and it is OK to start the system?

A: When an estop is tripped a graphic will show up and the side bar will indicate in red. After the Estop is reset, all the indicators will be cleared. The operator will need to reset the estop using the reset button located on the motor control panel, then restart the system. *See* Interpreting the Graphics *and* Figure 11 - E-Stop Flag Example

Q: How do I know what each color means?

A: Color codes are identified in the Legend. *See Page 17* – Figure 15 - Alarm Messages Display

Q: What is an AOR heartbeat.

A: It is a communication interlock between AOR and the PLC to make sure the communication channel is up and running.

Q: When a graphic shows an X instead of its intended color, what does that mean?

A: It could be a communication error. Please re-establish communication by rebooting the PC, and/or checking network connections and configuration. Updating the PLC logic without updating the HMI may cause this as well. Please make sure you have the latest HMI file running.

Q: Why is the HMI running slowly?

A: The PC may be running low on Memory. Please check the task monitor. Try stopping unused services or restart the PC.

Q: What do I do when a pop-up window displays "License Not Found"?

A: It's possible that more than one client is open, try shutting down one client. It's also possible that the license dongle is disconnected. If you are unable to resolve the issue, please contact us via email at controlssupport@bastiansolutions.com, or call Customer Support at 1-844-BASTIAN (227-8426).

Q: What do I do when a pop-up window displays "Server Not Found"?

A: To resolve:
- Check Ethernet communications.
- Check if HMI server is running.
- If more than one HMI client PC is available, check another client. If that is working correctly, restart the PC which is not working.

Q: What is "Scanner No Data?

A: This usually means that a scanner is not sending data or is sending data late. To resolve, reboot the scanner.

Q: Why do some conveyors show up in Manual run and some do not?

A: This function is only available for certain conveyor types.

Q: What do I do if I can't open the client on a Client/Server setup, if one or more of the computers are communicating with each other?

A: Check to ensure your firewall settings are turned OFF. This setting can get turned back ON during a Windows or an Adobe software update.

8   Glossary of Terms and Acronyms

CCS   **Conveyor Control System**
Custom hardware and software components that provide control of the Carton conveyor system components. Interfaces with the WCS for routing and confirmation data.

WCS   **Warehouse Control System**
A custom software package by Bastian Solutions that acts as the interface between the warehouse management software (WMS) and the conveyor controls system (CCS).

AOR   **Automated Order Routing**
AOR is a custom software provide by BSS to interface between WCS and the CCS. AOR provides all the routing instructions directly to tags in the PLCS of the CCS via an OPC server.

E-STOP   **Emergency Stop**
A condition initiated by pushing any of the E-STOP pushbuttons or pulling any E-STOP pull cord in the system. (See Emergency Stop section for zoning). An E-STOP will kill electrical power in the area of the switch that was activated.

HMI   **Human-Machine Interface**
Also known as a graphical user interface (GUI). The HMI is a set of custom screens designed to display conveyor status, faults, production counts, etc., as well as provide a means to start and stop the system and clear faults.

LPN   **License Plate Number**
Allows the WMS to obtain details about the contents or the carton, tote, or pallet

MCP   **Motor Control Panel**
A large control panel that includes motor starters overload relays, circuit breakers, transformers, and I/O devices required to start and stop the motors near the panel.

PLC   **Programmable Logic Controllers**
PLC Based Control Development software by Siemens.

AOI   **Add-On Instruction**
Instruction used in the AB RSLogix PLC programming environment. Allows the same code to be used in multiple locations in the code as separate instances.

PC   **Personal Computer**
A standard, IBM-compatible computer. PCs are used for the Human Machine Interfaces and Automated Order Routing Database.

PLd   **Performance Level**
Category 3 rated performance level.

Ethernet IP   **Industrial Ethernet**
A standard for Ethernet field bus communication protocol in automation technology. This is used for networking of multiple controllers to one another.

SP   **Scan Point**

UPS   **Uninterruptible Power Supply**
Also known as a battery backup. Provides up to 15 minutes of reserve power in the event the AC power feeding the outlet for the PC fails.

VFD   **Variable Frequency Drive**
An electric device that controls the speed of a motor by varying the frequency of the electrical supply power.

Validation   Services to ensure compliance with applicable federal government regulations for computer and software validation for medical device industries.

Tray   Formed by tray forming machine with no flaps.

Tote　　　　　A plastic container to hold product that is reused.

Box / Carton　Formed by box erector and has flaps.

ZPA　　　　　Zero Pressure Accumulation

Container　　A Tote or carton placed on the conveyor that can hold product inside

MDR　　　　　Motorized Drive Roller – 24VDC motors found on conveyors

Bastian Solutions Human Machine Interface Owner's Guide
Bastian Solutions HMI Owner's Guide

Bastian Solutions
10585 N. Meridian St.
3rd Floor
Indianapolis, IN 46290 USA

First Edition 2018
Second Edition 2019