Customised Solutions
Toll Global Logistics Division

Toll Enterprise

Materials Handling System for the Sydney Fashion Distribution Centre

Conveyor Functional Specification

34 Yarrunga Street, Prestons, NSW

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Referenced Documents

Ref	Document Reference	Rev	Source	Document Name
1.	P06418_SE_SS	A	Dematic	System Specification
2.	P06418_CE_FS2	A1	Dematic	DirectorView Functional Specification
3.	P06418_WCS-PLC A1	A1	Dematic	WCS-PLC Interface Specification
4.	P6418 Toll Fashion CC51 Rev A5	A5	Dematic	Conveyor Electrical Drawings CC51
5.	P6418 Toll Fashion CC52 Rev A5	A5	Dematic	Conveyor Electrical Drawings CC52
6.	P6418 Toll Fashion CC53 Rev A5	A5	Dematic	Conveyor Electrical Drawings CC53
7.	P6418 Toll Fashion CC54 Rev A5	A5	Dematic	Conveyor Electrical Drawings CC54
8.	P6418 Toll Fashion CC61 Rev A5	A5	Dematic	Conveyor Electrical Drawings CC61
9.	P6418 Toll Fashion CC62 Rev A5	A5	Dematic	Conveyor Electrical Drawings CC62
10.	P6418 Toll Fashion CC63 Rev A5	A5	Dematic	Conveyor Electrical Drawings CC63

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Contents

1 Introduction

1.1 Scope

This document describes the functional requirements of the conveyor system installed at the Toll Project Enterprise Warehouse 5, Prestons, New South Wales site.

It covers the following issues:

- Design of the conveyor control system
- Conveyor control system hierarchy
- Conveyor control system operation

Items excluded in the documentation are details of peripheral equipment such as the:

- Compressed Air system (by Dematic),
- Trash compactor (by Toll).

1.2 Intended Readers

The intended readers of this document are:

- Dematic project management
- Dematic controls engineering
- Toll project team

2 Abbreviations and Definitions

2.1 Abbreviations

Abbreviation	Meaning
CC	Control Cabinet
LAN	Local Area Network
PC	Personal Computer
PE	Photo-Electric sensor
PLC	Programmable Logic Controller
PPI	Pulse Position Indicator sensor
RC	Remote Cabinet
MCM	Mixed Case Module
HMI	Human Machine Interface
OFS	Order Fulfilment System
WCS	Warehouse Control System
MFC	Material Flow Controller

2.2 Definitions

Carrier
Any container such as a carton or tote that moves on the conveying system to transport the contents of an order, and which can be identified.

Operational Fault
Any fault, which can be rectified by an operator. Examples are:

- Tripped emergency stop
- Pressed stop button
- Jam fault
- Transfer time out
- Photocell misaligned
- Safety guard open
- Carton rejected

Maintenance Fault
Any fault, which usually requires a maintenance person to clear. Examples are:

- Motor overload
- Circuit breaker tripped
- Low air pressure
- Inverter fault
- Sensor fault
- PPI encoder fault

3 System Overview

3.1 System Description and Conveyable Specifications

Please refer to the System Specification for details.

4 System Components

4.1 Main Control Cabinet

The main control cabinets will supply power to the conveyor and multishuttle systems. Each Main Control Cabinet has a Programmable Logic Controller (PLC) which controls its designated area. The Main Control Cabinets have either a touch screen embedded in them, or a Mobile Panel Connection Point for operating system. More information on the control cabinets is specified below.

4.2 Label Printer Applicator

Label Print Applicators are label printers that automatically print, and apply labels on cartons that are either stationary or moving on a conveyor bed. Labels can be applied on the side of a carton or on the top. The automatic label print applicator interfaces to the WCS via Ethernet, and PLC via voltage free contacts. The WCS provides label data to the applicator when the PLC notifies the WCS that a carton is available for a label. The triggering of the print and apply label is controlled by the applicator.

4.3 Barcode reader(s)

Laser scanner(s) will be mounted throughout the system. Typically, they shall be located at; decisions point such as divert points; verification points such as label application; and confirmation points such as at the Pick Station of a multishuttle, rapid picks stations, and document insertion areas.

4.4 Conveyors

4.4.1 Transport Conveyors

These are powered conveyors that transport product from the charge end of the conveyor to the discharge end of the conveyor without any form of accumulation. Naturally, many boxes may be on these conveyors at any one time, but as soon as the downstream conveyor stops running and the end photoeye is blocked (if there is one), these conveyors stop.

4.4.2 Accumulation Conveyors

Accumulation conveyors transport product from the charge end of the conveyor to the discharge end of the conveyor in a similar fashion as the transport conveyor. Accumulation conveyors however, have the ability to accumulate product whenever the conveyor downstream of the accumulator is not able to accept product.

4.4.3 Rack Conveyors

Rack conveyors are two zone accumulation conveyors that interface product from the multishuttle to the elevators. Shuttles can pick up from the most downstream zone of the infeed rack conveyors, and drop to the most upstream zone of the outfeed rack conveyors.

4.4.4 Weighing Conveyor

Weighing conveyors are belt conveyors that is fitted with photoelectric sensors and strain gauges to measure the weight of a moving carrier. Typically the belt conveyor is long enough to fit one carrier and is driven by a variable speed drive. The sensors and strain gauge are connected to a logic unit that measures and calculates the weight and provides the data to a PLC via profibus.

4.5 Document Inserters

The document inserter, prints paper documents such as invoices, pick slips or return slips. The machine has the ability to fold the printed sheets prior to automatically dispensing them inside associated cartons that are travelling on the conveyor. The document inserter shall receive document information for printing from the WCS via a shared file location. For carton control and barcode data the document inserter shall interface with the PLC by voltage free contacts and TCPIP socket.

4.6 DirectorVIEW (SCADA System)

The visualization system provides supervisory control and data acquisition (SCADA) for the operation of the conveyor and multishuttle systems.

Operation and control of the visualization is described in a separate operating manual.

The Visualization PC provides the following functions:

- Overall conveyor start/stop control
- Control cabinet status
- Conveyor equipment status and fault condition details
- Multishuttle equipment status
- Data logging of alarms and acknowledgments

4.7 Divert Points

The system contains divert points. Divert points are used to route cartons through the conveyor system.

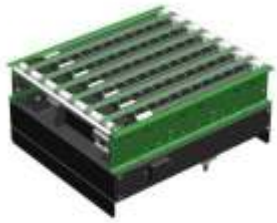
4.7.1 Standard RAPT Divert

The STD RAPT mechanism is used to move a carrier at 90 degrees from one conveyor to another. 24V roller is used to transfer product from the charge to the discharge ends. The 90 degree transfer is a 400V powered set of bands.

Each RAPT is controlled by a spring return, single solenoid valve which, when energised, raises the RAT. The RAT diverts will be down in maintenance mode.

4.7.2 High Speed RAT Divert

The HS RAT mechanism is used to move a carrier at 90 degrees from one conveyor to another at high speed. Transportation strip belts slaved to the main line transport the carrier from charge to discharge ends of the RAT. Because these belts are slaved the speed is matched to that of the main line. The 90 degree transfer is a 48V powered roller.



Each RAT is controlled by a spring return, single solenoid valve which, when energised, raises the RAT. The RAT diverts will be down in maintenance mode.

4.7.3 Steerable Wheel Divert (SWD)

The Steerable wheel divert mechanism is used to move a carrier from one conveyor to another at an angle of 30 degrees. A Steerable wheel divert can either divert a carrier or allow it to continue straight.

Each Steerable wheel divert is controlled by a motor, when energised, turns the Steerable wheel.

4.8 Carton Erector

The carton erector shall automate the forming of two different sized cardboard cartons and inject them into the conveying system. The carton erector shall electrically interlock with the PLC, which shall provide the signals to create the different sized cartons and also signal the machine when the conveyors are ready to receive them.

4.8.1 Carton Height Reducing Lid Applicator

The carton height reducing lid applicator is a dual cartridge carton lidding machine that measures, scores, folds down, glues, and lids, fulfilled order cartons. The carton lidding machine has a two lid option which can be selected by the PLC. A finished order carton is singulated through four stages of the lidder machine. The first stage measures the carton and the height of the contents. The carton then moves on to next stage where the outside of the carton is scored to the measure height. The third stage folds down the carton at the scored lines. And the final stage a selected lid placed and secured by glue. The machine is electrically interfaced with the PLC for lid selection and conveyor downstream permits.

4.9 Lifts

Used for lifting product from the pick station to multishuttle levels and back to the drop station. The lifts installed are the Generation II Multishuttle lifts, using SEW motors and inverters, as well as a barcode positioning system on the mast to finely position the lifting carriage. The lifts can travel at up to 4m/s.

4.10 Merge Points

A merge point is an intersection of one or more feeder lines onto a main line. PLC tracking logic is used to determine optimal merge parameters.

4.10.1 Wedge Merge

The system contains wedged conveyors to merge cartons to the main line. Cartons will be tracked along the main line conveyor and when a suitable gap is detected, the carrier will be injected into the main line.

4.10.2 SBOR Injection Belt Merge

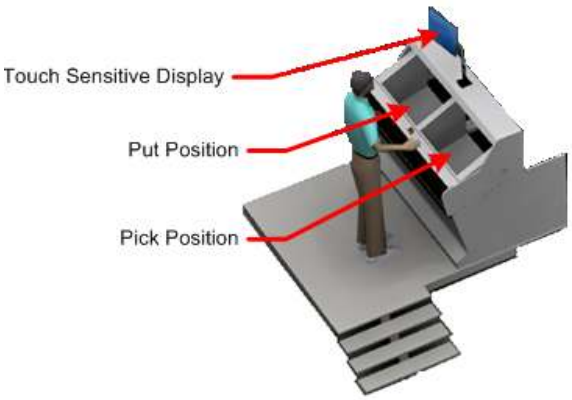
The system contains SBOR injection belts to merge cartons. The SBOR injection belt is positioned perpendicular to the main line. Cartons are tracked along the main line conveyor and when a suitable gap is detected, the carton waiting on the injection belt will be merged into the main line gap.

4.11 Multishuttle

Multishuttles carry transport cartons into the rack. There shall be two types installed at Toll, FLEX MultiShuttle and Standard MultiShuttle. Generally the multishuttles pick up cartons one at a time using telescoping extending arms and fingers that can raise/lower to pull a carton onboard. It then drives to its destination location in the rack and drops the carton there for retrieval later. The FLEX Multishuttle also has the ability to adjust itself to accommodate different widths cartons. The multishuttle shall be Dematic's Gen II shuttle, which can reach speeds of 4m/s.

4.12 Rapid Pick Station

A Rapid Pick station is a high speed operator workstation. It presents both the order carton and donor tote to the operator alongside each other at the same time. This allows the operator to easily and quickly pick and transfer the required order from donor tote to order carton.



Note: 1:1 - The first number defines the amount of positions in front of the picker which provide a “product-bearing donor tote”. The second number defines the amount of positions in front of the picker which provides (or supports) an “order tote/carton”.

Prior to using the Rapid Pick workstation the operator is able to raise / lower the operator platform, via a foot pedal, such that the pick workstation is positioned at an ergonomic height for the pick operation.

4.13 Verification Stations

4.13.1 Barcode and Height Check

A two sided barcode and height check is performed at carton induction after the application of the licence plate label. The height of the carton is detected by a height photoelectric sensor and two scanners are positioned to scan both sides of the carton where the barcodes are scanned and compared by the PLC. If both barcodes are present and the same the height and barcode data is forwarded to the WCS. If the barcode compare process fails or if the WCS confirms a failure, the carton shall stop at the verification photoelectric sensor and a blue annunciator shall flash.

4.13.2 Scan Weight and Profile Check

A scan, weight and profile check is used to check the integrity of carriers and ensure that the licence plate barcodes are identical, the weight of the unit load is within tolerance and check for any contents above the height of the carrier. The PLC shall perform these checks with two barcode scanners, a check weight conveyor and photoelectric sensor. Should any items fail the WCS is notified and it shall redirect the carrier to a quality assurance station.

4.13.3 Height Check

A height check station ensure that a carrier or contents within the carrier has not protruded above the maximum specified height of the system. A height check shall use a photoelectric sensor to scan above a moving carrier. If the carrier fails the check the carrier is either sent to a quality assurance station or stopped at a verification check point.

5 Controls Devices, Signals and Indicators

This section describes the electrical control equipment of the conveyor system. Unless specified otherwise, all conveyor controls are designed to operate in an ambient temperature range from 4°C to 40°C at a maximum relative humidity of 90% non-condensing. All electrical installation work is carried out to comply with Australian Standards AS3000 and AS3008. The system design will also take into consideration the requirements of AS1755 where applicable.

Voltages used are 400 V, 3-phase, 50 Hz for conveyor motors, 240V AC and 24V DC for motor contactor coils and typically 24V DC for control devices.

5.1 Conveyor Main Control Cabinet

5.1.1 Control Cabinet Specification

Components mounted within control cabinets are fitted with a printed identification label indicating the device reference as used in the electrical schematics.

All control cabinets are rated for a minimum Ingress Protection (IP) rating of IP54; this provides satisfactory protection for water and dust protection for the environment that they will be installed in.

The design of the control cabinets is based upon the heat dissipation of the control equipment mounted in each panel. Cooling/Heating requirements are met by equipment fitted to these cabinets for operation in an environment with a maximum external ambient temperature of 40°C and a minimum ambient temperature of -1 °C. If the external ambient temperature exceeds the maximum designed temperature permanent damage to the control equipment may occur.

All equipment mounted inside the control cabinets will be protected to IP20 rating to provide protection against the risk of electric shock from direct contact with electrically live parts.

The design of the control system conforms to standards for Electro-Magnetic Compatibility (EMC). Where required, the use of line filters, suppression devices, shielding and other techniques for EMC immunity and limitation of EMC emissions are employed.

5.1.2 Power Supply for Main Cabinets

The main cabinet requires an electrical supply of 400V, 3-phase, 50Hz, including neutral and earth conductors. The maximum demand (not operating current) for the cabinet:

Area	Cabinet	Full Load Current Requirement
Multishuttle	+1E1,+2E1,+3E1,+4E1,+5E1,+6E1, +7E1,+8E1,+9E1,+10E1,+11E1,+12E1, +13E1,+14E1,+15E1,+16E1,+17E1, +18E1,+19E1,+20E1,+21E1,+22E1, +23E1,+24E1,+25E1,+26E1,+27E1, +28E1,+29E1,+30E1,+31E1, & +32E1	63A
Conveyor	CC51	84.8A
Conveyor	CC52	84.8A
Conveyor	CC53	86.3A
Conveyor	CC54	50.0A
Conveyor	CC61	75.4A
Conveyor	CC62	43.4A
Conveyor	CC63	66.9A

The termination points provided for the incoming power is sized on the basis that the incoming cable is the minimum necessary to achieve a maximum 2.5% voltage drop. Excessively large incoming cable may necessitate a variation for oversize termination points or bus work. The maximum prospective fault current of the supply should be less than 50 kA. The supply frequency variation should not exceed +/- 1%.

This supply (400V, 3-phase, 50Hz, including neutral and earth conductors) is to be provided, installed and terminated by the customer. This supply installation includes the manufacture, installation and cabinet modification to mount suitable non-ferrous gland plates if the incoming supply is run in single core cables.

5.1.3 Colour

All cabinets shall have the color as RAL7035.

5.1.4 Cabinet Controls Contents

The main control cabinet contains a mains disconnect switch, thermal magnetic motor over-current protection, and power surge protection. The cabinets also contain a Programmable Logic Controller (PLC) which provides the logical control of equipment. The cabinets also contain Safety Rated Programmable Logic Controllers (PLC's) which provide the logical control of equipment and emergency stop requirements. Pre-wired terminal strips are provided for connection of field equipment.

The door of the main control cabinet is equipped with the following controls:

5.1.4.1 Main Disconnect Switch

The main disconnect switch isolates the entire cabinet from the incoming main supply. This switch is mechanically interlocked to the cabinet door and is pad-lockable in the OFF position. The padlocks for securing in the off position are not supplied by Dematic.

5.1.4.2 Emergency Stop Push Button

A red latching mushroom head button immediately stops all devices controlled from the cabinet when pressed. Twisting to release the button resets it from the latched position.

5.1.4.3 System Start Push Button

A white, illuminated SYSTEM START push button starts the associated system when momentarily pressed. This button is illuminated steady when any part of the system is operational.

5.1.4.4 System Stop Push Button

A black, non-illuminated SYSTEM STOP push button stops the associated system when pressed. Certain conveyors may continue to run following actuation of the SYSTEM STOP button in order to complete product transfers.

5.1.4.5 Colour LCD Touch Panel

A LCD touch panel shall be mounted on the conveyor control cabinet door.

Some of the features provided by the touch panel:

5.1.4.5.1 Cabinet Mode Selection

A cabinet mode selection menu on screen allows one of the following cabinet modes to be selected:

OFF this mode disables all cabinet and field mounted controls.

AUTOMATIC this mode allows normal operation of the conveyors in response to the automatic controls and local operator control stations.

MAINTENANCE this mode allows the conveyors to operate only in response to associated start/stop push buttons and Emergency Stop controls. Interlocks and automatic controls are disabled.

In maintenance mode all conveyors operate continuously without sensor interlocks, i.e. jam and line full conditions are not functional. This mode is designed to check equipment operation.

Only qualified maintenance personnel should use this mode for maintenance purposes **ONLY**, and **NOT** to convey product.

MANUAL this mode allows individual conveyors to be run for maintenance purposes.

5.1.4.5.2 Lamp Test

When enabled, the LAMP TEST function tests all lamps controlled from the control cabinet. Maintenance personnel should test the operation of these devices periodically and replace any components found defective.

The lamps are pulsed in the sequence amber, green, blue, siren and then amber again. All annunciator stations are pulsed simultaneously.

5.1.4.5.3 Alarms / Events Screen

This screen advises operators of any faults which are active in the conveyor system. This includes:

- emergency stop devices activated,
- stop buttons pressed,
- jam faults,
- air pressure faults,
- communication faults to/from the host system (Route Director),
- encoder faults,
- motor circuit breaker faults,
- fire alarm.

5.1.5 Fire Alarm signal

The fire alarm system can be interfaced with the conveyor control system to perform a controlled shutdown of the conveyor system in the event of a fire in the building.

Depending on the system, a minimum number of seconds is required after the fire signal is activated, before power can be removed from each Control Cabinet to prevent damage to the conveyor system.

Dematic shall provide terminals within the conveyor control cabinet for the building services to connect to.

The fire alarm system must provide a potential free Normally Closed (NC) VFC contact that changes over to the Open state when a fire condition exists.

Provision for the electrical wiring / installation, setup of the building services fire signal and supply of a voltage free contact is **NOT** in the scope of supply of Dematic.

5.2 Common Field Controls

Several types of field mounted devices are used to control and indicate the status of the conveyor system. These are described below. Field equipment for the conveyor system will be installed to Australian Standards AS3000 and AS3008.

5.2.1 Emergency Stop Controls

Emergency stop devices are provided throughout the conveyor system. These devices are **not** intended for stopping conveyors under normal circumstances and should **only be used in the event of an emergency**.

Before the affected conveyors can be restarted, the appropriate emergency stop must be located and manually reset. For the carrier conveyor system it is preferable that all affected transfer points and diverts first be cleared to prevent the possibility of jams when the conveyors are restarted.

There are two main types of emergency stop devices located around the conveyor system:

Emergency Stop Push Buttons	Emergency stop push buttons are provided adjacent to conveyors, and may also be provided at local control stations. Actuators are of the mushroom head twist to release style, colored red with a yellow background.
Emergency Stop Pull Cord	Emergency stop pull cords (Lanyards) are provided in certain locations. The pull cord switch is actuated by pulling the cord or if the cord becomes slack. A pull cord may span more than one conveyor.

5.2.2 Start/Stop Control Stations

Control stations are located in areas frequented by operational personnel for the purpose of conveyor control.

Start/Stop stations feature a momentary START push button and a momentary STOP push button.

5.2.3 Annunciator Stations

Annunciator lamps and sirens are placed around the conveyor system to inform personnel of cabinet and conveyor status. Each annunciator provides the status for the conveyors in its immediate vicinity. When active, the various annunciator lamps/sirens have the meanings described below.

Green indicates system status:

Fast Flash	Conveyor start-up warning.
Slow Flash	Conveyor are stopped in sleep mode. The conveyors will restart when product are sensed at the upstream conveyor or the start push button is pressed.
Steady	System running (conveyors may restart at any time without further warning)

Amber indicates the following:

Fast Flash	Operational fault occurred on local conveyor (e.g. transfer fault, photocell misalignment or jam.
Slow Flash	Emergency Stop or stop button actuated and latched in the local area. Safety guard open, or safety circuit no reset. The signal turn off as soon as the stops are reset.
Steady	Maintenance fault has occurred on a local conveyor. This requires a qualified maintenance person to reset. A typical example is a thermal overload condition. After a fault is cleared an applicable start push button must be actuated.

White indicates the following:

Slow Flash:	30 second indication of a carrier passing through to the overshoot lane.
Steady	A sort lane has reached a full status.

Flash Rates Fast = 2 per second

Slow = 1 per second

Sirens These sound for a period of five seconds prior to conveyor start-up, but typically do not sound when conveyors restart automatically. The sirens operate at a sound level of 85dBA.

5.2.3.1 Blue

indicates the following:

Steady: Carrier requires attention due to a failed process.

5.2.4 Motor Isolating Switches

Motor Isolating Switches are provided adjacent to each drive, or in groups. These are for maintenance purposes only and are capable of being padlocked in the OFF position. The affected conveyor may start without warning when the switch is returned to the ON position. **Before working on any conveyor the equipment must be correctly isolated in accordance with the safe working procedures.** In general this will mean isolating the motor(s) at the respective switch disconnector(s) as a minimum precaution.

5.2.5 Pneumatic Pressure Switch

A pressure switch is provided to monitor the level of air pressure in the compressed air line. A minimum pressure is required for some devices in the system to operate correctly. Air pressure faults are indicated by a fault message on the LCD panel on the control cabinet door.

5.2.6 Photo-electric Sensors

Photo-electric sensors (PEs) are used for the detection of product at various locations throughout the conveyor system. The PEs are usually of the retro-reflective type, and are typically set to a “light-on” mode of operation where a device output signal is generated when the beam is not obscured. Diffuse type sensors may be used in operator areas.

5.2.7 Encoders

Encoders or Pulse Position Indicators (PPI) are located on the sort conveyors, divert and merge collector belts as well as conveyors associated with the scanner and carton measuring and tracking. These are driven directly from the conveyor motor and generate pulses at a rate directly proportional to the speed of the conveyor. Each pulse is equivalent to a certain linear distance of conveyor travel.

6 Conveyor System Logical Design

6.1 Emergency Stop Zones

Emergency stop devices installed within the conveyor system are grouped into emergency stop zones. When an emergency stop device in a zone is actuated, all equipment in that zone will stop.

The emergency stops zones and location of emergency stop devices are listed in the following table.

Area	Control Cabinet	Emergency Stop Area	Location of Emergency Stop Actuators
Order Carton Conveyor	CC51	EZ01A	P1301, P3001
Order Carton Conveyor	CC51	EZ01C	RP01, P3001, P1101
Order Carton Conveyor	CC51	EZ02A	P1302, P3002
Order Carton Conveyor	CC51	EZ02C	RP02, P3002, P1102
Order Carton Conveyor	CC51	EZ03A	P1303, P3003
Order Carton Conveyor	CC51	EZ03C	RP03, P3003, P1103
Order Carton Conveyor	CC51	EZ04A	P1304, P3004
Order Carton Conveyor	CC51	EZ04C	RP04, P3004, P1104
Order Carton Conveyor	CC51	EZ05A	P1305, P3005
Order Carton Conveyor	CC51	EZ05C	RP05, P3005, P1105, P1105
Order Carton Conveyor	CC51	EZ06A	P1306, P3006
Order Carton Conveyor	CC51	EZ06C	RP06, P3006, P1106
Order Carton Conveyor	CC51	EZ07A	P1307, P3007
Order Carton Conveyor	CC51	EZ07C	RP07, P3007, P1107

Area	Control Cabinet	Emergency Stop Area	Location of Emergency Stop Actuators
Order Carton Conveyor	CC51	EZ08A	P1308, P3008
Order Carton Conveyor	CC51	EZ08C	RP08, P3008, P1108
Order Carton Conveyor	CC52	EZ09A	P1309, P3009
Order Carton Conveyor	CC52	EZ09C	RP09, P3009, P1109
Order Carton Conveyor	CC52	EZ10A	P1310, P3010
Order Carton Conveyor	CC52	EZ10C	RP10, P3010, P1110
Order Carton Conveyor	CC52	EZ11A	P1311, P3011
Order Carton Conveyor	CC52	EZ11C	RP11, P3011, P1111
Order Carton Conveyor	CC52	EZ12A	P1312, P3012
Order Carton Conveyor	CC52	EZ12C	RP12, P3012, P1112
Order Carton Conveyor	CC52	EZ13A	P1313, P3013
Order Carton Conveyor	CC52	EZ13C	RP13, P3013, P1113, P1313
Order Carton Conveyor	CC52	EZ14A	P1314, P3014
Order Carton Conveyor	CC52	EZ14C	RP14, P3014, P1114
Order Carton Conveyor	CC52	EZ15A	P1315, P3015
Order Carton Conveyor	CC52	EZ15C	RP15, P3015, P1115
Order Carton Conveyor	CC52	EZ16A	P1316, P3016
Order Carton Conveyor	CC52	EZ16C	RP16, P3016, P1116
Order Carton Conveyor	CC52	EZ17A	P1317, P3017
Order Carton Conveyor	CC52	EZ17C	RP17, P3017, P1117
Order Carton Conveyor	CC53	EZ18A	P1318, P3018

Area	Control Cabinet	Emergency Stop Area	Location of Emergency Stop Actuators
Order Carton Conveyor	CC53	EZ18C	RP18, P3018, P1118
Order Carton Conveyor	CC53	EZ19A	P1319, P3019
Order Carton Conveyor	CC53	EZ19C	RP19, P3019, P1119
Order Carton Conveyor	CC53	EZ20A	P1320, P3020
Order Carton Conveyor	CC53	EZ20C	RP20, P3020, P1120
Order Carton Conveyor	CC53	EZ21A	P1321, P3021
Order Carton Conveyor	CC53	EZ21C	RP21, P3021, P1121, P1321
Order Carton Conveyor	CC53	EZ22A	P1322, P3022
Order Carton Conveyor	CC53	EZ22C	RP22, P3022, P1122
Order Carton Conveyor	CC53	EZ23A	P1323, P3023
Order Carton Conveyor	CC53	EZ23C	RP23, P3023, P1123
Order Carton Conveyor	CC53	EZ24A	P1324, P3024
Order Carton Conveyor	CC53	EZ24C	RP24, P3024, P1124
Order Carton Conveyor	CC54	EZ51	P1051, P1151, P3051, P2051, P1027, P1028, P2051
Order Carton Conveyor	CC54	EZ52	P1052, P1152, P3052, P2052, P1029, P1030, P2052, P2252
Order Carton Conveyor	CC54	EZ53	P1053, P1153, P3053, P2053, P1031, P1032, P2053, P2253, P3053
Order Carton Conveyor	CC54	EZ54	P2554, P2654, P1154, P1254, P1454, P1654, P2354, P6154, P3254, P4054, P4254, P3454, P3554, P4454, P3554, P1754, P3754
Order Finishing Conveyor	CC61	EZ61	P1061, P3754
Packing Conveyor	CC61	EZ71	P5861, P1361, P7171, P1471, P2071, P2671, P3271, P3871, P4471, P5071, P5671, P6271, P7371, P9371, P7671, P6771, P2871, P3071, P3471, P3671, P4071, P4271, P4671, P4871, P5271, P5471, P5871, P6071

Area	Control Cabinet	Emergency Stop Area	Location of Emergency Stop Actuators
Order Finishing Conveyor	CC61	EZ73	P1273, P1573, P1773, P1873, P2073, P2373, P2573, P3273, P3373, P4573, P3673, P4573, P4773, P4973, P5373, P5473, P5673, P6073, P6673, P7373, P8073, P3154, P1162
Outbound Conveyor	CC62	EZ62	P1025, P1026, P2162, P1062, P3262, P3662, P3662, P3762, P3862, P4162, P3962, P8162, P7162, P6162, P5162, P8061, P3362
Product Tote Conveyor	CC63	EZ63	P1963, P2463, P1963, P3863, P4063, P8963, P1363, P1463, P1663, P2063, P2263, P1763, 1OP, 2OP, 3OP, 4OP, 5OP, 6OP, 7OP, 8OP, 9OP, 10OP, 11OP, 12OP, 13OP, 14OP, 15OP, 16OP, 17OP, 18OP, 19OP, 20OP, 21OP, 22OP, 23OP, 24OP
Trash Conveyor	CC63	EZ6A	P9763, P9863, P9963

Table 6.1-1 Emergency Stop Devices

6.2 Three Phase (3P) Motor Groups

Conveyors are grouped into three phase (3P) motor groups. The 3P motor groups are used to control the three phase supply to the conveying equipment as part of the emergency safe stop requirements.

Emergency stop devices are defined into emergency stop zones. When an emergency stop devices is activated, the motor group configured to the zone shall perform the correct safe stop requirements.

The motor groups and emergency stop zone relationships are defined below:

Area	Control Cabinet	Emergency Stop Zones	3P Group	Associated Conveyors
Order Carton (GTP)	CC51	EZ51,EZ52, EZ54	3P1	P1004, P1104, P1204, P1003, P1103, P1203, P5651, P5051, P5151, P5251, P5351, P5451, P5551, P5751, P5851, P5951, P6051, P6151, P1002, P1102, P1202, P1001, P1101, P1201
Order Carton Conveyor	CC51	EZ51,EZ52, EZ54	3P2	P2251, P2351, P4051, P4151, P4251, P1005, P1105, P1205, P1006, P1106, P1206
Order Carton Conveyor	CC51	EZ51,EZ52, EZ54	3P3	P7651, P7051, P7151, P7251, P7351, P7451, P7551, P7751, P7851, P7951, P8051, P8151, P1007, P1107, P1207, P1008, P1108, P1208
Order Carton Conveyor	CC51	EZ51,EZ52, EZ54	3P4	P9251, P9051, P9151, P9351, P2027, P2028, P2051, P2151, P3051, P1651, P1751, P1851, P1951, P3151, P1127, P1027, P1028, P1128, P1151, P1451, P1551
Order Carton Conveyor	CC51	EZ51,EZ54, EZ01A,EZ01C	3P101	P1301, P2001, P3001, P4001, P4101, P4201

Area	Control Cabinet	Emergency Stop Zones	3P Group	Associated Conveyors
Order Carton Conveyor	CC51	EZ51,EZ54, EZ02A,EZ02C	3P102	P1302, P2002, P3002, P4002, P4102, P4202
Order Carton Conveyor	CC51	EZ51,EZ54, EZ03A,EZ03C	3P103	P1303, P2003, P3003, P4003, P4103, P4203
Order Carton Conveyor	CC51	EZ51,EZ54, EZ04A,EZ04C	3P104	P1304, P2004, P3004, P4004, P4104, P4204
Order Carton Conveyor	CC51	EZ51,EZ54, EZ05A,EZ05C	3P205	P1305, P2005, P3005, P4005, P4105, P4205
Order Carton Conveyor	CC51	EZ51,EZ54, EZ06A,EZ06C	3P206	P1306, P2006, P3006, P4006, P4106, P4206
Order Carton Conveyor	CC51	EZ51,EZ52, EZ54, EZ07A, EZ07C	3P307	P1307, P2007, P3007, P4007, P4107, P4207
Order Carton Conveyor	CC51	EZ51,EZ52, EZ54, EZ08A, EZ08C	3P308	P1308, P2008, P3008, P4008, P4108, P4208
Order Carton Conveyor	CC52	EZ51,EZ52, EZ53, EZ54	3P1	P1009, P1109, P1209, P1010, P1110, P1210, P1011, P1111, P1211, P5652, P5052, P5152, P5252, P5352, P5452, P5552, P5752, P5852, P5952, P6052, P6152, P1012, P1112, P1212
Order Carton Conveyor	CC52	EZ51,EZ52, EZ53, EZ54	3P2	P2252, P2352, P2452, P4052, P4152, P4252, P1013, P1113, P1213
Order Carton Conveyor	CC52	EZ51,EZ52, EZ53, EZ54	3P3	P7652, P7052, P7152, P7252, P7352, P7452, P7552, P7752, P7852, P7952, P8052, P8152, P1014, P1114, P1214, P1015, P1115, P1215, P1016, P1116, P1216
Order Carton Conveyor	CC52	EZ51,EZ52, EZ53, EZ54	3P4	P2052, P2152, P3052, P1652, P1752, P1852, P1952, P3152, P1029, P1129, P1030, P1130, P1152, P1452, P1552, P9252, P9052, P9152, P9352, P2029, P2031
Order Carton Conveyor	CC52	EZ52, EZ54, EZ09A,EZ09C	3P109	P1309, P2009, P3009, P4009, P4109, P4209
Order Carton Conveyor	CC52	EZ52, EZ54, EZ10A,EZ10C	3P110	P1310, P2010, P3010, P4010, P4110, P4210
Order Carton Conveyor	CC52	EZ52, EZ54, EZ11A,EZ11C	3P111	P1311, P2011, P3011, P4011, P4111, P4211
Order Carton Conveyor	CC52	EZ52, EZ54, EZ12A,EZ12C	3P112	P1312, P2012, P3012, P4012, P4112, P4212
Order Carton Conveyor	CC52	EZ52, EZ54, EZ13A,EZ13C	3P213	P1313, P2013, P3013, P4013, P4113, P4213
Order Carton Conveyor	CC52	EZ52, EZ54, EZ14A,EZ14C	3P214	P1314, P2014, P3014, P4014, P4114, P4214

Area	Control Cabinet	Emergency Stop Zones	3P Group	Associated Conveyors
Order Carton Conveyor	CC52	EZ52, EZ54, EZ15A,EZ15C	3P315	P1315, P2015, P3015, P4015, P4115, P4215
Order Carton Conveyor	CC52	EZ52, EZ54, EZ16A,EZ16C	3P316	P1316, P2016, P3016, P4016, P4116, P4216
Order Carton Conveyor	CC53	EZ52,EZ53, EZ54	3P1	P1020, P1120, P1220, P1019, P1119, P1219, P5653, P5053, P5153, P5253, P5353, P5453, P5553, P5753, P5853, P5953, P6053, P6153, P1018, P1118, P1218, P1017, P1117, P1217
Order Carton Conveyor	CC53	EZ52,EZ53, EZ54	3P2	P2353, P2253, P4053, P4153, P4253, P1021, P1121, P1221, P1022, P1122, P1222
Order Carton Conveyor	CC53	EZ52,EZ53, EZ54	3P3	P7653, P7053, P7153, P7253, P7353, P7453, P7553, P7753, P7853, P7953, P8053, P8153, P1023, P1123, P1223, P1024, P1124, P1224
Order Carton Conveyor	CC53	EZ52,EZ53, EZ54	3P4	P9253, P9053, P9153, P9353, P2032, P2031, P9553, P9653, P2053, P2153, P3053, P1653, P1753, P1853, P1953, P3153, P1131, P1031, P1032, P1132, P1153, P1453, P1553
Order Carton Conveyor	CC53	EZ53, EZ54, EZ17A,EZ17C	3P117	P1317, P2017, P3017, P4017, P4117, P4217
Order Carton Conveyor	CC53	EZ53, EZ54, EZ18A,EZ18C	3P118	P1318, P2018, P3018, P4018, P4118, P4218
Order Carton Conveyor	CC53	EZ53, EZ54, EZ19A,EZ19C	3P119	P1319, P2019, P3019, P4019, P4119, P4219
Order Carton Conveyor	CC53	EZ53, EZ54, EZ20A,EZ20C	3P120	P1320, P2020, P3020, P4020, P4120, P4220
Order Carton Conveyor	CC53	EZ53, EZ54, EZ21A,EZ21C	3P221	P1321, P2021, P3021, P4021, P4121, P4221
Order Carton Conveyor	CC53	EZ53, EZ54, EZ22A,EZ22C	3P221	P1322, P2022, P3022, P4022, P4122, P4222
Order Carton Conveyor	CC53	EZ53, EZ54, EZ23A,EZ23C	3P323	P1323, P2023, P3023, P4023, P4123, P4223
Order Carton Conveyor	CC53	EZ53, EZ54, EZ24A,EZ24C	3P324	P1324, P2024, P3024, P4024, P4124, P4224
Order Carton Conveyor	CC54	EZ54	3P1	P5154, P1154, P1054, P2654, P5054, P2554, P1254, P1354, P5254, P5354, P1454
Order Carton Conveyor	CC54	EZ54	3P2	P1854, P2054, P1954, P2154, P2254, P2354, P2454, P1754, P1654, P1554
Order Carton Conveyor	CC54	EZ54	3P3	P3054, P3154, P3254, P3354, P3454, P3554, P4454, P4054, P4154, P4254
Order Carton Conveyor	CC54	EZ54	3P4	P3654, P3754

Area	Control Cabinet	Emergency Stop Zones	3P Group	Associated Conveyors
Order Carton Conveyor	CC54	EZ54, EZ73	3P5	P6154, P6054
Order Finishing Conveyor	CC61	EZ61,EZ71,EZ73	3P1	P1173, P1073, P9061, P1061, P1161, P1261
Packing Conveyor	CC61	EZ71	3P2	P1361, P5761, P5861, P6371, P1761, P1461, P1561, P1661, P1861, P1961, P2061, P2161, P5271, P5371, P5471, P5571, P5671, P5871, P5971, P6071, P6171, P6271, P5771, P5171, P2561, P2261, P2361, P2461, P2661, P2761, P2861, P2961, P4071, P4171, P4271, P4371, P4471, P4671, P4771, P4871, P4971, P5071, P4571, P3971
Packing Conveyor	CC61	EZ71	3P3	P2771, P3371, P3361, P3061, P3161, P3261, P3461, P3561, P3661, P3761, P2871, P2971, P3071, P3171, P3271, P3471, P3571, P3671, P3771, P3871, P4161, P3861, P3961, P4061, P4261, P4361, P4461, P5061, P1671, P1771, P1871, P1971, P2071, P2271, P2371, P2471, P2571, P2671, P2171, P1571, P5461, P5161, P5261, P5361, P5561, P1071, P1171, P1271, P1371, P1471, P5661
Packing Conveyor	CC61	EZ71	3P4	P7771, P7571, P9271, P7371, P7171, P7271, P7471, P7671, P9171
Order Finishing Conveyor	CC61	EZ71,EZ73	3P5	P6471, P6571, P6671, P6771, P7071
Order Finishing Conveyor	CC61	EZ73	3P6	P1473, P1573, P1773, P1873, P9371, P9471, P1273, P1373, P2173, P2473, P2073, P2273, P2373, P2573, P4573, P3073, P3173, P3273, P3473, P3573, P3673, P5473, P5573, P5773, P5873, P5973, P6073, P6173, P4673, P4773, P4873, P5073, P5173, P5273, P5373, P8073, P6273, P6373, P6673, P7073, P7373
Order Finishing Conveyor	CC61	EZ73	3P7	P8173, P8273, P8373, P8071, P7971
Outbound Conveyor	CC62	EZ62, EZ73	3P1	P2062, P2025, P2026, P2162, P2262, P3062, P1062, P1162, P1562, P1762, P1662, P1862, P1025, P1026
Outbound Conveyor	CC62	EZ62	3P2	P5162, P6162, P3662, P3162, P3262, P3362, P3462, P7062, P5062, P6062, P8062, P7362, P5362, P6362, P8362, P7162, P8162, P9362, P9062, P9162, P9262, P9462, P9562, P8762, P8462, P8562, P8662, P8862, P8962, P3762, P3862
Outbound Conveyor	CC62	EZ62	3P3	P3962, P4362, P4262, P4162

Area	Control Cabinet	Emergency Stop Zones	3P Group	Associated Conveyors
Product Tote Conveyor	CC63	EZ63	3P1	P1963, P1763, P1663, P1263, P1463, P1563, P1863, P2163, P2263, P2063, P2363, P2463, P1363, P5002, P5001, P5003, P5004, P6001, P6002, P6003, P6004, P5006, P5005, P5007, P5008, P6005, P6006, P6007, P6008, P5010, P5009, P5011, P5012, P6009, P6010, P6011, P6012, P1163, P5014, P5013, P5015, P5016, P6013, P6014, P6015, P6016, P5018, P5017, P5019, P5020, P6017, P6018, P6019, P6020, P5022, P5021, P5023, P5024, P6021, P6022, P6023, P6024, P1063
Product Tote Conveyor	CC63	EZ63	3P2	P2563, P3163, P2663, P2763, P3063, P3263, P9263, P3363, P2963, P2863, P3463, P3663, P3763, P3863, P3963, P3563
Product Tote Conveyor	CC63	EZ63	3P3	P8463, P8163, P8263, P8363, P8563, P8663, P8763, P8863, P8963, P9063, P9163, P7663, P7363, P7463, P7563, P7763, P7863, P7963, P8063, P6863, P6563, P6663, P6763, P6963, P7063, P7163, P7263, P6063, P5763, P5863, P5963, P6163, P6263, P6363, P6463, P5263, P4963, P5063, P5163, P5363, P5463, P5563, P5663, P4463, P4063, P4163, P4263, P4363, P4563, P4663, P4763, P4863
Trash Conveyor	CC63	EZ63, EZ63A	3P4	P9563, P9663, P9763, P9863, P9963

Table 6.2-1 Three Phase Motor Groups

6.3 Start/Stop Areas

Conveyors are grouped into functional groups for starting and stopping controls. Local control stations are provided for operators to start/stop the conveyors in the area of operation. In addition, operators have the use of the control cabinet start/stop controls, and also an overall system start/stop control function. All controls (local and higher level) are also replicated on the DirectorVIEW system.

The relationships between start/stop controls and the equipment controlled are given in the following tables.

Area	Control Cabinet	Start or Start/ Stop Station	Equipment Started	Equipment Stopped
Order Carton Conveyor	CC51	ST11511, ST11512	All Conveyors in CC51, CC54, CC61, and CC62	All Conveyors in CC51
Order Carton Conveyor	CC51	ST13011	All Conveyors in CC51, and CC54	NA
Order Carton Conveyor	CC51	ST13021	All Conveyors in CC51, and CC54	NA
Order Carton Conveyor	CC51	ST13031	All Conveyors in CC51, and CC54	NA
Order Carton Conveyor	CC51	ST13041	All Conveyors in CC51, and CC54	NA
Order Carton Conveyor	CC51	ST13051	All Conveyors in CC51, and CC54	NA
Order Carton Conveyor	CC51	ST13061	All Conveyors in CC51, and CC54	NA
Order Carton Conveyor	CC51	ST13071	All Conveyors in CC51, and CC54	NA
Order Carton Conveyor	CC51	ST13081	All Conveyors in CC51, and CC54	NA
Order Carton Conveyor	CC52	ST11521, ST11522	All Conveyors in CC52,CC54, CC61 and CC62	All Conveyors in CC52
Order Carton Conveyor	CC52	ST13091	All Conveyors in CC52, and CC54	NA
Order Carton Conveyor	CC52	ST13101	All Conveyors in CC52, and CC54	NA
Order Carton Conveyor	CC52	ST13111	All Conveyors in CC52, and CC54	NA
Order Carton Conveyor	CC52	ST13121	All Conveyors in CC52, and CC54	NA
Order Carton Conveyor	CC52	ST13131	All Conveyors in CC52, and CC54	NA
Order Carton Conveyor	CC52	ST13141	All Conveyors in CC52, and CC54	NA

Area	Control Cabinet	Start or Start/ Stop Station	Equipment Started	Equipment Stopped
Order Carton Conveyor	CC52	ST13151	All Conveyors in CC52, and CC54	NA
Order Carton Conveyor	CC52	ST13161	All Conveyors in CC52, and CC54	NA
Order Carton Conveyor	CC53	ST11531, ST11532	All Conveyors in CC53, CC54 CC61, and CC62	All Conveyors in CC53
Order Carton Conveyor	CC53	ST13171	All Conveyors in CC53 and CC54	NA
Order Carton Conveyor	CC53	ST13181	All Conveyors in CC53 and CC54	NA
Order Carton Conveyor	CC53	ST13191	All Conveyors in CC53 and CC54	NA
Order Carton Conveyor	CC53	ST13201	All Conveyors in CC53 and CC54	NA
Order Carton Conveyor	CC53	ST13211	All Conveyors in CC53 and CC54	NA
Order Carton Conveyor	CC53	ST13221	All Conveyors in CC53 and CC54	NA
Order Carton Conveyor	CC53	ST13231	All Conveyors in CC53 and CC54	NA
Order Carton Conveyor	CC53	ST13241	All Conveyors in CC53 and CC54	NA
Order Carton Conveyor	CC54	ST43541	All Conveyors in CC54	All Conveyors in CC54

Area	Control Cabinet	Start or Start/ Stop Station	Equipment Started	Equipment Stopped
Packing Conveyor	CC61	ST50711, ST26711, ST67711	P9061, P1061, P1161, P1261, P1361, P5761, P5861, P6371, P1761, P1461, P1561, P1661, P1861, P1961, P2061, P2161, P5271, P5371, P5471, P5571, P5671, P5871, P5971, P6071, P6171, P6271, P5771, P5171, P2561, P2261, P2361, P2461, P2661, P2761, P2861, P2961, P4071, P4171, P4271, P4371, P4471, P4671, P4771, P4871, P4971, P5071, P4571, P3971, P2771, P3371, P3361, P3061, P3161, P3261, P3461, P3561, P3661, P3761, P2871, P2971, P3071, P3171, P3271, P3471, P3571, P3671, P3771, P3871, P4161, P3861, P3961, P4061, P4261, P4361, P4461, P5061, P1671, P1771, P1871, P1971, P2071, P2271, P2371, P2471, P2571, P2671, P2171, P1571, P5461, P5161, P5261, P5361, P5561, P1071, P1171, P1271, P1371, P1471, P5661, P7771, P7571, P9271, P7371, P7171, P7271, P7471, P7671, P9171 ,P6471, P6571, P6671,P6771, P7071, All Conveyors in CC62	P5761, P5861, P6371, P1761, P1461, P1561, P1661, P1861, P1961, P2061, P2161, P5271, P5371, P5471, P5571, P5671, P5871, P5971, P6071, P6171, P6271, P5771, P5171, P2561, P2261, P2361, P2461, P2661, P2761, P2861, P2961, P4071, P4171, P4271, P4371, P4471, P4671, P4771, P4871, P4971, P5071, P4571, P3971, P2771, P3371, P3361, P3061, P3161, P3261, P3461, P3561, P3661, P3761, P2871, P2971, P3071, P3171, P3271, P3471, P3571, P3671, P3771, P3871, P4161, P3861, P3961, P4061, P4261, P4361, P4461, P5061, P1671, P1771, P1871, P1971, P2071, P2271, P2371, P2471, P2571, P2671, P2171, P1571, P5461, P5161, P5261, P5361, P5561, P1071, P1171, P1271, P1371, P1471, P5661, P7771, P7571, P9271, P7371, P7171, P7271, P7471, P7671, P9171, P6471, P6571, P6671,P6771, P7071
Order Finishing Conveyor	CC61	ST25731, ST35731, ST63731, ST70731	P1061, P1161, P1173, P1073, P7771, P7571, P9271, P7371, P7171, P7271, P7471, P7671, P9171, P6471, P6571, P6671, P6771, P7071, P1473, P1573, P1773, P1873, P9371, P9471, P1273, P1373, P2173, P2473, P2073, P2273, P2373, P2573, P4573, P3073, P3173, P3273, P3473, P3573, P3673, P5473, P5573, P5773, P5873, P5973, P6073, P6173, P4673, P4773, P4873, P5073, P5173, P5273, P5373, P8073, P6273, P6373, P6673, P7073, P7373, P8173, P8273, P8373, P8071, P7971	P1161, P1173, P1073, P7771, P7571, P9271, P7371, P7171, P7271, P7471, P7671, P9171, P6471, P6571, P6671, P6771, P7071, P1473, P1573, P1773, P1873, P9371, P9471, P1273, P1373, P2173, P2473, P2073, P2273, P2373, P2573, P4573, P3073, P3173, P3273, P3473, P3573, P3673, P5473, P5573, P5773, P5873, P5973, P6073, P6173, P4673, P4773, P4873, P5073, P5173, P5273, P5373, P8073, P6273, P6373, P6673, P7073, P7373, P8173, P8273, P8373, P8071, and P7971.
Outbound Conveyor	CC62	ST41621	All Conveyors in CC62	All Conveyors in CC62

Area	Control Cabinet	Start or Start/ Stop Station	Equipment Started	Equipment Stopped
Outbound Conveyor	CC62	ST10621	All Conveyors in CC62	All Conveyors in CC62
Outbound Conveyor	CC62	ST33621	All Conveyors in CC62	All Conveyors in CC62
Outbound Conveyor	CC62	ST36621	All Conveyors in CC62	All Conveyors in CC62
Outbound Conveyor	CC62	ST36622	All Conveyors in CC62	All Conveyors in CC62
Outbound Conveyor	CC62	ST36623	All Conveyors in CC62	All Conveyors in CC62
Outbound Conveyor	CC62	ST17621	All Conveyors in CC62	All Conveyors in CC62
Product Tote Conveyor	CC63	ST24631	All Conveyors in CC63	All Conveyors in CC63
Product Tote Conveyor	CC63	ST25631	All Conveyors in CC63	All Conveyors in CC63
Product Tote Conveyor	CC63	ST29631	All Conveyors in CC63	All Conveyors in CC63
Product Tote Conveyor	CC63	ST28631	All Conveyors in CC63	All Conveyors in CC63
Trash Conveyor	CC63	ST97631	P9563, P9663, P9763, P9863, P9963	P9563, P9663, P9763, P9863, P9963
Trash Conveyor	CC63	ST99631	P9563, P9663, P9763, P9863, P9963	P9563, P9663, P9763, P9863, P9963

Table 6.3-1 Start/Stop Control Areas

6.4 Annunciators

Annunciator lamps and sirens are located throughout the conveyor system. At least one annunciator can be seen from any point along the conveyor system.

General system annunciators consist of an Amber light, a Green light and a Siren (AGS). The sorter annunciator consists of an Amber light, a Green light, a White light and a Siren (AGWS).

The table below describes the annunciators in the system and the conveyors associated with them.

Area	Control Cabinet	Annunciator	Type	Equipment Associated
Order Carton Conveyor	CC51	HP30511	AGS	P1151, P1451, P1551, P1651, P1751, P1851, P1951, P2051, P2151, P3051, P3151, P9051, P9151, P9351, P1127, P1027, P1028, P1128, P2027, P2028
Order Carton Conveyor	CC51	HP11511	Blue	P1151
Order Carton Conveyor	CC51	HP41511	AGS	P4051, P4151, P4251, P5051, P5151, P5251, P5351, P5451, P5551, P5651, P5751, P5851, P5951, P6051, P6151, P7051, P7151, P7251, P7351, P7451, P7551, P7751, P7851, P7951, P8051, P8151
Order Carton Conveyor	CC51	HP13011	AGS	P1001, P1101, P1201, P1301, P2001, P3004, P4001, P4101, P4201
Order Carton Conveyor	CC51	HP13021	AGS	P1002, P1102, P1202, P1302, P2002, P3005, P4002, P4102, P4202
Order Carton Conveyor	CC51	HP13031	AGS	P1003, P1103, P1203, P1303, P2003, P3006, P4003, P4103, P4203
Order Carton Conveyor	CC51	HP13041	AGS	P1004, P1104, P1204, P1304, P2004, P3007, P4004, P4104, P4204
Order Carton Conveyor	CC51	HP13051	AGS	P1005, P1105, P1205, P1305, P2005, P3008, P4005, P4105, P4205
Order Carton Conveyor	CC51	HP13061	AGS	P1006, P1106, P1206, P1306, P2006, P3009, P4006, P4106, P4206
Order Carton Conveyor	CC51	HP13071	AGS	P1007, P1107, P1207, P1307, P2007, P3010, P4007, P4107, P4207
Order Carton Conveyor	CC51	HP13081	AGS	P1008, P1108, P1208, P1308, P2008, P3011, P4008, P4108, P4208
Order Carton Conveyor	CC52	HP30521	AGS	P1152, P1452, P1552, P1652, P1752, P1852, P1952, P2052, P2152, P2252, P2352, P2452, P3052, P3152, P9252, P9052, P9152, P9352, P1029, P1129, P1030, P1130, P2029, P2030

Area	Control Cabinet	Annunciator	Type	Equipment Associated
Order Carton Conveyor	CC52	HP11521	Blue	P1152
Order Carton Conveyor	CC52	HP41521	AGS	P4052, P4152, P4252, P5052, P5152, P5252, P5352, P5452, P5552, P5652, P5752, P5852, P5952, P6052, P6152, P7052, P7152, P7252, P7352, P7452, P7552, P7652, P7752, P7852, P7952, P8052, P8152
Order Carton Conveyor	CC52	HP13091	AGS	P1009, P1109, P1209, P1309, P2009, P3009, P4009, P4109, P4209
Order Carton Conveyor	CC52	HP13101	AGS	P1010, P1110, P1210, P1310, P2010, P3010, P4010, P4110, P4210
Order Carton Conveyor	CC52	HP13111	AGS	P1011, P1111, P1211, P1311, P2011, P3011, P4011, P4111, P4211
Order Carton Conveyor	CC52	HP13121	AGS	P1012, P1112, P1212, P1312, P2012, P3012, P4012, P4112, P4212
Order Carton Conveyor	CC52	HP13131	AGS	P1013, P1113, P1213, P1313, P2013, P3013, P4013, P4113, P4213
Order Carton Conveyor	CC52	HP13141	AGS	P1014, P1114, P1214, P1314, P2014, P3014, P4014, P4114, P4214
Order Carton Conveyor	CC52	HP13151	AGS	P1015, P1115, P1215, P1315, P2015, P3015, P4015, P4115, P4215
Order Carton Conveyor	CC52	HP13161	AGS	P1016, P1116, P1216, P1316, P2016, P3016, P4016, P4116, P4216
Order Carton Conveyor	CC53	HP30531	AGS	P1153, P1453, P1553, P1653, P1753, P1853, P1953, P2053, P2153, P2253, P2353, P3053, P3153, P9053, P9153, P9253, P9353, P9553, P9653, P1031, P1032, P1131, P1132, P2031, P2032
Order Carton Conveyor	CC53	HP11531	Blue	P1153
Order Carton Conveyor	CC53	HP41531	AGS	P4053, P4153, P4253, P5053, P5153, P5253, P5353, P5453, P5553, P5653, P5753, P5853, P5953, P6053, P6153, P7053, P7153, P7253, P7353, P7453, P7553, P7653, P7753, P7853, P7953, P8053, P8153
Order Carton Conveyor	CC53	HP13171	AGS	P1017, P1117, P1217, P1317, P2017, P3017, P4017, P4117, P4217
Order Carton Conveyor	CC53	HP13181	AGS	P1018, P1118, P1218, P1318, P2018, P3018, P4018, P4118, P4218
Order Carton Conveyor	CC53	HP13191	AGS	P1019, P1119, P1219, P1319, P2019, P3019, P4019, P4119, P4219
Order Carton Conveyor	CC53	HP13201	AGS	P1020, P1120, P1220, P1320, P2020, P3020, P4020, P4120, P4220

Area	Control Cabinet	Annunciator	Type	Equipment Associated
Order Carton Conveyor	CC53	HP13211	AGS	P1021, P1121, P1221, P1321, P2021, P3021, P4021, P4121, P4221
Order Carton Conveyor	CC53	HP13221	AGS	P1022, P1122, P1222, P1322, P2022, P3022, P4022, P4122, P4222
Order Carton Conveyor	CC53	HP13231	AGS	P1023, P1123, P1223, P1323, P2023, P3023, P4023, P4123, P4223
Order Carton Conveyor	CC53	HP13241	AGS	P1024, P1124, P1224, P1324, P2024, P3024, P4024, P4124, P4224
Order Carton Conveyor	CC54	HP11541	AGS	P1054, P1154, P5154, P6054, P6154
Order Carton Conveyor	CC54	HP12541	AGS	P1254, P1354, P5254, P5354
Order Carton Conveyor	CC54	HP15541	AGS	P1454, P1554, P1654, P1754
Order Carton Conveyor	CC54	HP23541	AGS	P1854, P1954, P2054, P2154, P2254, P2354, P2454, P2554, P2654, P5054
Order Carton Conveyor	CC54	HP44541	AGS	P3054, P3154, P3254, P3354, P3454, P3554, P3654, P3754, P4454, P4054, P4154, P4254
Order Finishing Conveyor	CC61	HP10611	AGS	P1061, P9061, P1073, P1161
Pack Conveyor	CC61	HP64711	AGS	P6471, P3661, P3761, P3861, P3961, P4061, P4161, P4261, P4361, P4461, P5061, P5161, P5261, P5361, P5461, P5561, P5661, P1071, P1171, P1271, P1371, P1471, P1571, P1671, P1771, P1871, P1971, P2071, P2171, P2271, P2371, P2471
Pack Conveyor	CC61	HP64712	AGS	P6471, P2561, P2661, P2761, P2861, P2961, P3061, P3161, P3261, P3361, P3461, P3561, P2571, P2671, P2771, P2871, P2971, P3071, P3171, P3271, P3371, P3471, P3571, P3671, P3771, P3871, P3971, P4071, P4171, P4271, P4371, P4471, P4571
Pack Conveyor	CC61	HP64713	AGS	P6471, P1261, P1361, P1461, P1561, P1661, P1761, P1861, P1961, P2061, P2161, P2261, P2361, P2461, P5761, P5861, P4671, P4771, P4871, P4971, P5071, P5171, P5271, P5371, P5471, P5571, P5671, P5771, P5871, P5971, P6071, P6171, P6271, P6371
Pack Conveyor	CC61	HP67711	AGS	P6471, P6571, P6671, P6771
Pack Conveyor	CC61	HP73711	AGS	P7071, P7171, P7271, P7371, P7471, P7571, P7671, P9171, P9271, P9371, P9471
Order Finishing Conveyor	CC61	HP14731	AGS	P1173, P1273, P1373, P1473, P1573, P1773, P1873, P2073, P2173, P2273, P2373, P2473, P2573

Area	Control Cabinet	Annunciator	Type	Equipment Associated
Order Finishing Conveyor	CC61	HP45731	AGS	P3073, P3173, P3273, P3473, P3573, P3673, P4573, P4673, P4773, P4873, P5473, P5573
Order Finishing Conveyor	CC61	HP61731	AGS	P5073, P5173, P5273, P5373, P5773, P5873, P5973, P6073, P6173, P6273, P6373, P6673, P7073, P7373, P8073, P8173, P8273, P8373, P7771, P7971, P8071
Order Finishing Conveyor	CC61	HP34731	Blue	P3473
Order Finishing Conveyor	CC61	HP50731	Blue	P5073
Order Finishing Conveyor	CC61	HP57731	Blue	P5773
Order Finishing Conveyor	CC61	HP63731	Blue	P6373
Order Finishing Conveyor	CC61	HP70731	Blue	P7073
Outbound Conveyor	CC62	HP10621	AGS	P1062, P1162, P1562, P2262, P3062, P3162, P3262
Outbound Conveyor	CC62	HP17621	AGS	P1762, P1662, P1862, P1025, P1026, P2025, P2026, P2062, P2162
Outbound Conveyor	CC62	HP33621	AGSW	P3662, P3762, P3862, P5062, P5162, P5362, P6062, P6162, P6362
Outbound Conveyor	CC62	HP33622	AGSW	P3662, P3762, P3862, P7062, P7162, P7362, P8062, P8162, P8362
Outbound Conveyor	CC62	HP33623	AGSW	P3662, P3762, P3862, P8462, P8562, P8662, P8762, P8862, P8962, P9062, P9162, P9262, P9362, P9462, P9562
Outbound Conveyor	CC62	HP41621	AGS	P3362, P3462, P3962, P4162, P4262, P4362
Product Tote Conveyor	CC63	HP19631	AGS	P1263, P1363, P1463, P1563, P1663, P1763, P1863, P1963, P2063, P2163, P2263, P2363, P2463, P9063, P9163
Product Tote Conveyor	CC63	HP27631	AGS	P2563, P2663, P2763, P3063, P3163, P3263, P3363, P9263, P9563
Product Tote Conveyor	CC63	HP28631	AGS	P2963, P2863, P3463, P3563, P3663, P3763, P3863, P3963, P9663
Product Tote Conveyor	CC63	HP11631	AGS	P1063, P5014, P5013, P5015, P5016, P6013, P6014, P6015, P6016, P5018, P5017, P5019, P5020, P5022, P5021, P5023, P5024, P6013, P6014, P6015, P6016, P6017, P6018, P6019, P6020, P6021, P6022, P6023, P6024, P4063, P4163, P4263, P4363, P4463, P4563, P4663, P4763, P4863, P4963, P5063, P5163, P5263, P5363, P5463, P5563, P5663, P5763, P5863, P5963, P6063, P6163, P6263, P6363, P6463

Area	Control Cabinet	Annunciator	Type	Equipment Associated
Product Tote Conveyor	CC63	HP10631	AGS	P1163, P5001, P5002, P5003, P5004, P5006, P5005, P5007, P5008, P5009, P5010, P5011, P5012, P6001, P6002, P6003, P6004, P6005, P6006, P6007, P6008, P6009, P6010, P6011, P6012, P6563, P6663, P6763, P6863, P6963, P7063, P7163, P7263, P7363, P7463, P7563, P7663, P7763, P7863, P7963, P8063, P8163, P8263, P8363, P8463, P8563, P8663, P8763, P8863, P8963
Trash Conveyor	CC63	HP98631	AGS	P9763, P9863, P9963

Table 6.4-1 **Annunciator Stations & Associated Conveyor**

6.5 Control Interlocks

6.5.1 Carton Erectors

The following interlock signals are available for the electrical interfacing of the Carton Erector and PLC.

Area	Control Cabinet	Interlock	Description	Device	PLC
Order Carton Conveyor	CC51	INT105	Emergency Stop From Device to PLC	Estop Button VFC	Safety Digital input
			Emergency From PLC to Device	Safety Relay	Safety Relay VFC
			Down-stream Wake Up	VFC	Digital input
			Machine Ready	VFC	Digital input
			Blank magazine empty	VFC	Digital input
			Select Case A or B	VFC	Digital input
			Remote Start	Digital input	VFC
			Remote Stop	Digital input	VFC
Order Carton Conveyor	CC52	INT105	Emergency Stop From Device to PLC	VFC	Safety Digital input
			Emergency From PLC to Device	Safety Relay	Safety Relay VFC
			Down-stream Wake Up	VFC	Digital input
			Machine Ready	VFC	Digital input
			Blank magazine empty	VFC	Digital input
			Select Case A or B	VFC	Digital input
			Remote Start	Digital input	VFC
Order Carton Conveyor	CC53	INT105	Emergency Stop From Device to PLC	VFC	Safety Digital input
			Emergency From PLC to Device	Safety Relay	Safety Relay VFC
			Down-stream Wake Up	VFC	Digital input
			Machine Ready	VFC	Digital input
			Blank magazine empty	VFC	Digital input
			Select Case A or B	VFC	Digital input
			Remote Start	Digital input	VFC
			Remote Stop	Digital input	VFC

Table 6.5-1 Carton Erector Interlock

6.5.2 Label Print Applicator

The following interlock signals are available for the electrical interfacing of the Label Print Applicator and PLC.

Area	Control Cabinet	Interlock	Description	Device	PLC
Order Carton Conveyor	CC51	INT125	LPA Ready	VFC	Digital input
			LPA Fault	VFC	Digital input
			LPA Warning	VFC	Digital input
			LPA Trigger	Digital input	VFC
Order Carton Conveyor	CC51	INT135	LPA Ready	VFC	Digital input
			LPA Fault	VFC	Digital input
			LPA Warning	VFC	Digital input
			LPA Trigger	Digital input	VFC
Order Carton Conveyor	CC52	INT125	LPA Ready	VFC	Digital input
			LPA Fault	VFC	Digital input
			LPA Warning	VFC	Digital input
			LPA Trigger	Digital input	VFC
Order Carton Conveyor	CC52	INT135	LPA Ready	VFC	Digital input
			LPA Fault	VFC	Digital input
			LPA Warning	VFC	Digital input
			LPA Trigger	Digital input	VFC
Order Carton Conveyor	CC53	INT125	LPA Ready	VFC	Digital input
			LPA Fault	VFC	Digital input
			LPA Warning	VFC	Digital input
			LPA Trigger	Digital input	VFC
Order Carton Conveyor	CC53	INT135	LPA Ready	VFC	Digital input
			LPA Fault	VFC	Digital input
			LPA Warning	VFC	Digital input
			LPA Trigger	Digital input	VFC
Order Finishing Conveyor	CC61	INT657A	LPA Ready	VFC	Digital input
			LPA Fault	VFC	Digital input
			LPA Warning	VFC	Digital input
			LPA Trigger	Digital input	VFC
Order Finishing Conveyor	CC61	INT727A	LPA Ready	VFC	Digital input
			LPA Fault	VFC	Digital input
			LPA Warning	VFC	Digital input
			LPA Trigger	Digital input	VFC

Area	Control Cabinet	Interlock	Description	Device	PLC
Order Finishing Conveyor	CC61	INT647A	LPA Ready	VFC	Digital input
			LPA Fault	VFC	Digital input
			LPA Warning	VFC	Digital input
			LPA Trigger	Digital input	VFC
Order Finishing Conveyor	CC61	INT717A	LPA Ready	VFC	Digital input
			LPA Fault	VFC	Digital input
			LPA Warning	VFC	Digital input
			LPA Trigger	Digital input	VFC

Table 6.5-2 Automatic Label Applicator Interlock

6.5.3 Document Inserters

The following interlock signals are available for the electrical interfacing of the Document Inserter and PLC.

Area	Control Cabinet	Interlock	Description	Device	PLC
Order Carton Conveyor	CC54	INT605A	System Ready	VFC	Digital input
			Cycle Complete	VFC	Digital input
			Reject Box	VFC	Digital input
			Box Present	Digital input	VFC
			Barcode Scanner 1	TCP/IP	TCP/IP
			Barcode Scanner 2	TCP/IP	TCP/IP
Order Carton Conveyor	CC54	INT615A	System Ready	VFC	Digital input
			Cycle Complete	VFC	Digital input
			Reject Box	VFC	Digital input
			Box Present	Digital input	VFC
			Barcode Scanner 1	TCP/IP	TCP/IP
			Barcode Scanner 2	TCP/IP	TCP/IP
Order Finishing Conveyor	CC61	INT167A	System Ready	VFC	Digital input
			Cycle Complete	VFC	Digital input
			Reject Box	VFC	Digital input
			Box Present	Digital input	VFC
			Barcode Scanner 1	TCP/IP	TCP/IP
			Barcode Scanner 2	TCP/IP	TCP/IP

Area	Control Cabinet	Interlock	Description	Device	PLC
Order Finishing Conveyor	CC61	INT197A	System Ready	VFC	Digital input
			Cycle Complete	VFC	Digital input
			Reject Box	VFC	Digital input
			Box Present	Digital input	VFC
			Barcode Scanner 1	TCP/IP	TCP/IP
			Barcode Scanner 2	TCP/IP	TCP/IP

Table 6.5-3 Document Inserter Interlock

6.5.4 Satchel Bagging Machine

The following interlock signals are available for the electrical interfacing of the Satchel Bagging Machine and PLC.

Area	Control Cabinet	Interlock	Description	Device	PLC
Packing Conveyor	CC61	INT287A	Emergency Stop From Device to PLC	Estop Button VFC	Safety Digital input
			Emergency From PLC to Device	Safety Relay	Safety Relay VFC
			Bagger Ready	VFC	Digital input
			Bagger Cycle	VFC	Digital input
			Downstream Ready to Receive	Digital input	VFC
Packing Conveyor	CC61	INT307A	Emergency Stop From Device to PLC	Estop Button VFC	Safety Digital input
			Emergency From PLC to Device	Safety Relay	Safety Relay VFC
			Bagger Ready	VFC	Digital input
			Bagger Cycle	VFC	Digital input
			Downstream Ready to Receive	Digital input	VFC
Packing Conveyor	CC61	INT347A	Emergency Stop From Device to PLC	Estop Button VFC	Safety Digital input
			Emergency From PLC to Device	Safety Relay	Safety Relay VFC
			Bagger Ready	VFC	Digital input
			Bagger Cycle	VFC	Digital input
			Downstream Ready to Receive	Digital input	VFC

Area	Control Cabinet	Interlock	Description	Device	PLC
Packing Conveyor	CC61	INT367A	Emergency Stop From Device to PLC	Estop Button VFC	Safety Digital input
			Emergency From PLC to Device	Safety Relay	Safety Relay VFC
			Bagger Ready	VFC	Digital input
			Bagger Cycle	VFC	Digital input
			Downstream Ready to Receive	Digital input	VFC
Packing Conveyor	CC61	INT407A	Emergency Stop From Device to PLC	Estop Button VFC	Safety Digital input
			Emergency From PLC to Device	Safety Relay	Safety Relay VFC
			Bagger Ready	VFC	Digital input
			Bagger Cycle	VFC	Digital input
			Downstream Ready to Receive	Digital input	VFC
Order Finishing Conveyor	CC61	INT427A	Emergency Stop From Device to PLC	Estop Button VFC	Safety Digital input
			Emergency From PLC to Device	Safety Relay	Safety Relay VFC
			Bagger Ready	VFC	Digital input
			Bagger Cycle	VFC	Digital input
			Downstream Ready to Receive	Digital input	VFC
Order Finishing Conveyor	CC61	INT467A	Emergency Stop From Device to PLC	Estop Button VFC	Safety Digital input
			Emergency From PLC to Device	Safety Relay	Safety Relay VFC
			Bagger Ready	VFC	Digital input
			Bagger Cycle	VFC	Digital input
			Downstream Ready to Receive	Digital input	VFC
Order Finishing Conveyor	CC61	INT487A	Emergency Stop From Device to PLC	Estop Button VFC	Safety Digital input
			Emergency From PLC to Device	Safety Relay	Safety Relay VFC
			Bagger Ready	VFC	Digital input
			Bagger Cycle	VFC	Digital input
			Downstream Ready to Receive	Digital input	VFC
Order Finishing Conveyor	CC61	INT527A	Emergency Stop From Device to PLC	Estop Button VFC	Safety Digital input
			Emergency From PLC to Device	Safety Relay	Safety Relay VFC

Area	Control Cabinet	Interlock	Description	Device	PLC
			Bagger Ready	VFC	Digital input
			Bagger Cycle	VFC	Digital input
			Downstream Ready to Receive	Digital input	VFC
Order Finishing Conveyor	CC61	INT547A	Emergency Stop From Device to PLC	Estop Button VFC	Safety Digital input
			Emergency From PLC to Device	Safety Relay	Safety Relay VFC
			Bagger Ready	VFC	Digital input
			Bagger Cycle	VFC	Digital input
			Downstream Ready to Receive	Digital input	VFC
Order Finishing Conveyor	CC61	INT587A	Emergency Stop From Device to PLC	Estop Button VFC	Safety Digital input
			Emergency From PLC to Device	Safety Relay	Safety Relay VFC
			Bagger Ready	VFC	Digital input
			Bagger Cycle	VFC	Digital input
			Downstream Ready to Receive	Digital input	VFC
Order Finishing Conveyor	CC61	INT607A	Emergency Stop From Device to PLC	Estop Button VFC	Safety Digital input
			Emergency From PLC to Device	Safety Relay	Safety Relay VFC
			Bagger Ready	VFC	Digital input
			Bagger Cycle	VFC	Digital input
			Downstream Ready to Receive	Digital input	VFC

Table 6.5-4 Satchel Bagging Interlock

6.5.5 Carton Height Reducing Lid Applicators

The following interlock signals are available for the electrical interfacing of the carton height reducing lid applicators and PLC.

Area	Control Cabinet	Interlock	Description	Device	PLC
Order Finishing Conveyor	CC61	INT337A	Emergency Stop From Device to PLC	Estop Button VFC	Safety Digital input
			Emergency From PLC to Device	Safety Relay	Safety Relay VFC
			Lidder Healthy	VFC	Digital input
			Lidder Ready to Receive	VFC	Digital input
			Lidder in Fault	VFC	Digital input
			Conveyor Wake Up	VFC	Digital input
			Lid Stock Low Warning	VFC	Digital input
			Glue System Low Warning	VFC	Digital input
			Conveyor Ready to Receive	Digital input	VFC
			Remote Start	Digital input	VFC
			Remote Stop	Digital input	VFC
			Lid type (Off=Type1, On=Type2)	Digital input	VFC
			Bypass (Off=Lid, On=No Lid)	Digital input	VFC
Order Finishing Conveyor	CC61	INT497A	Emergency Stop From Device to PLC	Estop Button VFC	Safety Digital input
			Emergency From PLC to Device	Safety Relay	Safety Relay VFC
			Lidder Healthy	VFC	Digital input
			Lidder Ready to Receive	VFC	Digital input
			Lidder in Fault	VFC	Digital input
			Conveyor Wake Up	VFC	Digital input
			Lid Stock Low Warning	VFC	Digital input
			Glue System Low Warning	VFC	Digital input
			Conveyor Ready to Receive	Digital input	VFC
			Remote Start	Digital input	VFC
			Remote Stop	Digital input	VFC
			Lid type (Off=Type1, On=Type2)	Digital input	VFC
			Bypass (Off=Lid, On=No Lid)	Digital input	VFC
Order Finishing Conveyor	CC61	INT567A	Emergency Stop From Device to PLC	Estop Button VFC	Safety Digital input

Area	Control Cabinet	Interlock	Description	Device	PLC
			Emergency From PLC to Device	Safety Relay	Safety Relay VFC
			Lidder Healthy	VFC	Digital input
			Lidder Ready to Receive	VFC	Digital input
			Lidder in Fault	VFC	Digital input
			Conveyor Wake Up	VFC	Digital input
			Lid Stock Low Warning	VFC	Digital input
			Glue System Low Warning	VFC	Digital input
			Conveyor Ready to Receive	Digital input	VFC
			Remote Start	Digital input	VFC
			Remote Stop	Digital input	VFC
			Lid type (Off=Type1, On=Type2)	Digital input	VFC
			Bypass (Off=Lid, On=No Lid)	Digital input	VFC

Table 6.5-5 Carton Lidder Interlock

6.5.6 Boom Conveyors

The following interlock signals are available for the electrical interfacing of the boom conveyors and PLC.

Area	Control Cabinet	Interlock	Description	Device	PLC
Outbound Conveyor	CC62	INT091A	Emergency Stop From Device to PLC	Estop Button VFC	Safety Digital input
			Emergency From PLC to Device	Safety Relay	Safety Relay VFC
			Ready to Receive	VFC	Digital input
Outbound Conveyor	CC62	INT091A	Emergency Stop From Device to PLC	Estop Button VFC	Safety Digital input
			Emergency From PLC to Device	Safety Relay	Safety Relay VFC
			Ready to Receive	VFC	Digital input
Outbound Conveyor	CC62	INT092A	Emergency Stop From Device to PLC	Estop Button VFC	Safety Digital input
			Emergency From PLC to Device	Safety Relay	Safety Relay VFC
			Ready to Receive	VFC	Digital input
Outbound Conveyor	CC62	INT093A	Emergency Stop From Device to PLC	Estop Button VFC	Safety Digital input
			Emergency From PLC to Device	Safety Relay	Safety Relay VFC
			Ready to Receive	VFC	Digital input

Table 6.5-6 Boom Interlock

6.5.7 Trash Compactor (Customer Supplied TBC)

The following interlock signals are available for the electrical interfacing of the customer supplied trash compactor and Dematic's PLC. **(TBC)**

Area	Control Cabinet	Interlock	Description	Device	PLC
Trash Conveyor	CC63		Emergency Stop From Device to PLC	Estop Button VFC	Safety Digital input
			Emergency From PLC to Device	TBC	TBC
			Ready to Receive	VFC	Digital input

Table 6.5-7 Trash Conveyor Interlock

7 Operator Procedures

7.1 System Start Procedure

Before the system is started for normal operation, the following conditions should be met for each conveyor sub-system:

1. Cabinet main disconnect switch in the **ON** position.
2. Cabinet mode selected in the **AUTO** on the HMI panel.
3. **STOP** buttons reset.
4. **EMERGENCY STOP** buttons reset.
5. All field motor isolating switches in the **ON** position.
6. All other faults cleared.

Once these conditions are satisfied, initiating a system start will start all conveyors for the relevant area. The conveyors will commence starting in sequential order beginning with the most downstream conveyor. If faults exist when starting, those individual conveyors with associated faults will not start.

DirectorView can also be used start the entire system is by using the System Start button.

7.2 System Stop Procedure

All of the conveyors within one system can be stopped by pressing the system stop button on the CC cabinet, or from the touch screen.

Following request of a system stop for the carton conveyor system, conveyors will stop sequentially commencing from the furthest upstream conveyor. Once all Unit Loads have stopped moving, the operating mode key switch may be turned to the **OFF** position.

It is RECOMMENDED that the main isolator on the main control cabinets be left in the **ON** position unless maintenance is being performed.

DirectorView can also be used stop the entire system is by using the System Stop button.

7.3 Carton Verification Failure Processing

7.3.1 Order Carton Induction and Despatch Labelling Area

Cartons that fail the barcode and height verification point at the order carton induction area or dispatch labelling area shall stop at the verification point and flash a blue light. To restart the area an operator shall perform the following process:

1. Remove the carton that is at the verification point.
2. Check the carton for missing or mismatching barcodes.
3. If the carton is missing the barcode check the label applicator and ensure that it is operating correctly. Remove any cartons at the label applicator.
4. If the barcodes are correct. Check the barcode scanners for any signs of obscurity.
5. Once check press the start button located at the blue light.

7.3.2 Lidding Area

Cartons that fail the height verification point at the lidding area shall stop at the verification point and flash a blue light. To restart the area an operator shall perform the following process:

1. Check the carton to see if is over height.
2. If it is over height, remove the carton and repack it.
3. If the carton within the height limits check the height detect sensor for obstruction or alignment.