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1. DESCRIPTION

1.1 Overview

The Silgan Soft Touch is a versatile package diversion unit capable of diverting various package types with high precision. The diversion function is performed by a maximum of twelve individual, pneumatically operated fingers.

The diversion operation of the Soft Touch can be configured to operate as a standard package ejector or as a production distributor. When operating as a package ejector, the Soft Touch interprets incoming reject signals from an upstream inspection unit. The value of the reject signals determine if the package will be passed or diverted. When operating as a production distributor, the Soft Touch can use its own sensors or an external sensor to track passing packages. The number of packages detected is recorded and used to determine if a package will be passed or diverted. Production distribution is performed in a periodic manner.

The reject signals that are compatible with the Soft Touch are Good/Bad Signals and Bad Pulses. In a Good/Bad signal configuration, two toggled signals are typically used. When the inspection unit detects a good package, the Good Signal would be toggled ON with the Bad Signal OFF and conversely when the inspection unit detects a bad package. In a Bad Pulse configuration, a single pulse is sent whenever a bad package is detected by the inspection unit. The reject signals can only be assigned when the diversion operation is set to package ejector.

The Soft Touch uses reject signals from the inspection unit to track packages as they move along the conveyor. As a bad package approaches the position of each enabled finger, the fingers will extend downwards. This diverts the bad package away from the straight conveyor path. The fingers will only extend when the bad packages are within their location and remain retracted for a good product.

The duration for which each individual finger remains extended is determined by several factors. The first set of factors are the width and spacing of packages. Due to differences in size, the extension duration for larger packages will tend to be greater than that of smaller packages. The second set of factors are advanced time responses. These responses are used to give each finger a sufficient amount of time to extend and retract without interfering with adjacent packages. The total extension duration is completely dynamic and is capable of responding to changes in conveyor speed.
1. DESCRIPTION

1.2 Diversion Operation

The Silgan Soft Touch can be used in various parts of a production line. Depending on its placement along the line, it may be used to divert packages based on the specific determination of an inspection unit or sensor. In such a case, the Soft Touch would be classified as a Package Ejector. Another use of the Soft Touch may be to indiscriminately pass and divert packages in a periodic manner to divide the load of a production line in two. In such a case, the Soft Touch would be classified as a Production Distributor.

1.2.1 Package Ejector

When the Soft Touch is used as a package ejector, it is necessary to have an external device, such as an inspection unit or sensor, provide reject signals to be used as criteria on when to pass or divert packages along the production line. The reject signals are wired from the external device to the control box of the Soft Touch. Once wired, there are several HMI screens that can be navigated through to program the Soft Touch on how to interpret the reject signals it receives. Additional details on reject signals and their methods of connection are described in subsequent sections.

*Note: If the Soft Touch is used as a Package Ejector, it cannot be used as a Production Distributor.*

1.2.2 Production Distributor

When the Soft Touch is used as a production distributor, there is no dependence on external devices to determine when to pass or divert packages. The inlet sensor of the Soft Touch may be used to track incoming packages and determine when they are passed and diverted. When the inlet sensor is used for production distribution, the sensor input in the control box must also be connected to one of the reject inputs. If the detection range of the Soft Touch inlet sensor is insufficient, an external sensor may be used to track the incoming packages. The output of the sensor must be connected to one of the reject inputs. Once wired, the reject input must be enabled in the HMI. Additional details on production distribution settings are described in subsequent sections.

*Note: If the Soft Touch is used as a Production Distributor, it cannot be used as a Package Ejector.*
1.3 Reject Signals

The Silgan Soft Touch has a provision for accepting a maximum of four reject signal inputs (REJA-REJD). Each input is fully electrically isolated and able to accept voltages from 4-24 VDC. The types of reject signals that the Soft Touch is capable of interpreting are:

- Good and Bad Paired Signals
- Bad Pulse Signals

1.3.1 Good and Bad Paired Signals

Good and bad paired signals are typically used when an inspection system is able to provide two distinct signal outputs for good and bad packages. The signals usually toggled so that one may never be the same state as the other with the exception being both in the OFF state (Figure 1-1).

When connecting good and bad paired signals to the Soft Touch, they must be wired to adjacent, paired inputs. For example, they can be wired to REJA and REJB or to REJC and REJD, but they cannot be wired to REJA and REJC, REJA and REJD, REJB and REJC, or REJB and REJD.

Once a set of reject inputs has been determined, there is no constraint on the location of a particular reject signal. For example, if REJC and REJD are selected for the reject inputs, then the good signal can be wired to either REJ or REJD. The assignment of the signal functions after this point is done during the setup procedure within the HMI.

![Good and Bad Paired Signals](image)
1. DESCRIPTION

1.3.2 Bad Pulse Signals

Bad pulse signals are typically used when an inspection system is able to provide a single signal output for bad packages. The signal is usually a brief pulse with a duration of several milliseconds (Figure 1-2).

There are no location constraints when connecting bad pulse signals to the Soft Touch; they may be wired to any of the four reject inputs. The assignment of the signal function after the reject input has been determined is done during the setup procedure within the HMI.

![Figure 1-2: Bad Pulse Signals](image-url)
1. DESCRIPTION

1.4 Reject Signal Tracking

The internal programming of the Soft Touch uses a shift register to track the signals it receives in the reject inputs. The shift register models the inspection-ejection configuration setup by setting the activation locations of the reject inputs in the appropriate distance from the shortest finger. The distance is determined by performing the Reject Signal Distance Sequence during the setup procedure. The reject signal distance can vary between package type. The shifting operation is completely controlled by the encoder as it shifts the signals whenever the conveyor has travelled roughly 1/10 of an inch. This resolution is determined by performing the Encoder Mapping Sequence during the initial setup procedure. Once conducted, it will never have to be repeated unless the encoder changes or if the conveyor is replaced.

It should be noted that there is a limit to the reject signal distance. As mentioned previously the reject signal distance is always the location where the reject signal is energized with respect to the position of the shortest finger. The maximum distance that a reject signal can be from the first finger is 80 inches. This is due to the size of the shift register. If a reject signal distance is greater than 80 inches, it will not be able to be calculated in the sequence or entered in the HMI. Paired signals will always have the same reject signal distance.

It should also be noted that there are instances in which tracked reject signals within the shift register may be cleared. An example of this scenario can be stopping the Soft Touch while it is running. If this occurs, the information within the shift register is immediately cleared and the signal tracking operation becomes disabled. Any incoming reject signals following this change in the machine state will be ignored. Similarly, transitioning to a state of suspension will also have this effect.
1. DESCRIPTION

1.5 Finger Extension Duration

The duration for which each enabled finger is extended for is critical to a successful diversion. Poorly configured settings likely result in diversion inaccuracy or inconsistent results. Several factors are considered for each diversion configuration for differing package types.

1.5.1 Package Width

When configuring setup parameters for each package type, an operator will encounter a set of screens to enter width parameters, the maximum width and the diversion width. The maximum width of each package type is the greatest linear distance across a package. The location of the maximum width varies between package types (Figure 1-3). The width resolution is to the nearest 1/10 of an inch, and measurements beyond this resolution must be rounded.

The diversion width of each package type is a percentage of the maximum width that is used to determine duration calculations. When there is insufficient spacing between packages, the finger extension or retraction may interfere with passed packages after diverted packages. To account for this, a percentage of the maximum width may be entered for the Soft Touch to interpret a package as a lesser width (Figure 1-4). By doing this, the extension duration is reduced across all enabled fingers and interference with passed packages is eliminated. If there is sufficient package spacing, then the diversion width percentage may be left at 100% and the Soft Touch will interpret the diversion width as the maximum width.

![Figure 1-3: Maximum Package Width Locations](image)

![Figure 1-4: Diversion Width Example](image)
1. DESCRIPTION

1.5.2 Advanced Responses

When configuring setup parameters for each package type, an operator will encounter a set of screens to enter time values in milliseconds for each finger, advanced response down and advanced response up.

The advanced response down time determines the time in which the finger will begin to shift towards a downward or extended state with respect to its position. If no advanced downward response time is entered for a finger, then it will not begin to extend until the package has reached the position of the finger. This will likely disturb the gradual diversion process. If an advanced downward response time is too high, then the finger may extend much earlier than needed. This may cause interference with a passing package.

The advanced response up time determines the time in which the finger will begin to shift towards an upward or retracted state after being down. If no advanced upward response time is entered for a finger, then it will not begin to extend until the full diversion width of the package has passed. This may cause interference with the trailing passing package. If an advanced upward response time is too high, then the finger may retract much earlier than needed. This may cause a diverting package to not be fully diverted.

When the advanced response times have been entered for each enabled finger, the Soft Touch converts them into distance values by multiplying each time by the current conveyor speed. We can consider these distances as $D_{\text{down}}$ and $D_{\text{up}}$ respectively. This ensures that the responses are dynamic and able to respond automatically to changes in conveyor speed. After they have been converted to distances, the downward distance is used to determine the diversion location by subtracting the downward distance from finger location (Figure 1-5).

After the diversion location has been determined for the finger, the extension duration is determined by subtracting the upward distance from the diversion width (Figure 1-6).

These are continuously calculated in the internal program to ensure that the durations are well-configured for the current conveyor speed and package type (Figure 1-7).
1. DESCRIPTION

\[ \text{Extension Location}_x \text{Finger} = \text{Position}_x - D_{\text{Down}} \]

*Figure 1-5: Location Formula*

\[ \text{Extension Duration}_x \text{Finger} = W_D - D_{\text{Up}} \]

*Figure 1-6: Duration Formula*

*Figure 1-7: Visual Representation of the Application of the Equations*
1. DESCRIPTION

1.6 PackML Compliant Control

PackML refers to a developing standardized format for production equipment controls in the packaging industry. It is meant to provide a common look and feel for equipment integration, operation, and maintenance. It is defined by the ANSI/ISA standard TR88.00.02.

1.6.1 Operating States

The HMI display shows the Operating States the Soft Touch can be in at any point in time (Figure 1-8). These states govern whether the diverting functions are operating. The current active state is highlighted on the screen.

- In the **Execute** state, the Soft Touch is actively tracking packages to pass or divert, according to the active operating mode and Soft Touch configuration.
- In the **Stopped** state, the Soft Touch is not tracking packages to pass or divert and all enabled fingers will be up. The state is initiated when the STOP button (Item 2) or the Emergency Stop button is pressed.
- In the **Idle** state, the Soft Touch is not tracking packages, but is ready to enter Execute when the START button (Item 1) is pressed. Enter Idle from the Stopped state by pressing the RESET button (Item 3). When in the Idle state, the START button flashes green.
- The **Held** state is entered from Execute when conditions internal to the Soft Touch, such as low air pressure, halt its operation. The Held state may also be entered if the operator presses the HOLD button (Item 4). Go back to Execute by pressing the START button (Item 1).
- The **Suspend** state is entered from Execute when line conditions external to the Soft Touch, such as a jam, halt its operation. Execute is re-entered when the halting conditions cease and the START button (Item 1) is pressed.
- The **Aborted** state is entered at any time when the operator presses the Emergency Stop button. To transition to the Stopped state, ensure the Emergency Stop button is pulled out and press the Safety Reset button. If no other faults exist, then there is a transition to the Idle state. If there are other existing faults, then there is a transition to the Stopped state.
- The **Completed** state is not used in the current iteration of the Soft Touch, but is displayed for informational purposes.
- All other states are transitional. They are passed through on the way to one of the above listed states. The Soft Touch may linger in one of these transitional states if an internal condition must be fulfilled and has not yet completed.
1. DESCRIPTION

![Diagram of PackML Operating States]

*Figure 1-8: PackML Operating States*
1. DESCRIPTION

1.6.2 Operating Modes

The HMI display shows the Operating Modes the Soft Touch can be in at any point in time (Figure 1-9). These states govern whether the diversion functions are operating. The button for the current active mode will be lit on the screen.

**Maintenance**

In the MAINTENANCE MODE, the Soft Touch is not actively diverting. It can only be entered if the operating state is stopped. Testing various functions such as finger operation, interface outputs, and the signal light can be done in this mode.

**Setup/Adjust**

The Soft Touch must be in the SETUP/ADJUST MODE in order for any configuration parameters to be changed. Package tracking and diverting will occur in SETUP/ADJUST MODE.

**Production**

In PRODUCTION MODE passing and diverting is performed as configured and any parameter changes are disallowed.

**Divert None**

In the DIVERT NONE MODE no packages will be diverted. The Soft Touch must be started for this mode to take effect.

**Divert Normal**

In the DIVERT NORMAL MODE all operation will be performed, as configured. The Soft Touch must be started for this mode to take effect.

**Divert All**

In the DIVERT ALL MODE all packages will be diverted. The Soft Touch must be started for this mode to take effect.
1. DESCRIPTION

Figure 1-9: Operation Control Screen and Operating Modes
1. DESCRIPTION

1.6.3 PackTags

The PackTags of the Soft Touch can be accessed at any point in time by navigating to the main PackML Control Screen and then cycling through each screen. The PackTags can also be accessed by connecting to the PLC. There are three sets of tags that are displayed.

Status

These tags provide information on the current settings and status of the Soft Touch.

- SST_Status_UnitModeCurrent
- SST_Status_StateCurrent
- SST_Status_MachSpeed
- SST_Status_CurMachSpeed
- SST_Status_EquipmentInterlock_Blocked
- SST_Status_EquipmentInterlock_Starved

Administration

These tags provide information on statistical parameters and state unique stop codes.

- SST_Admin_ProdProcessedCount_Count
- SST_Admin_ProdDefectiveCount_Count
- SST_Admin_StopReason_ID

Command

These tags provide information on operator commands and setting changes to the Soft Touch.

- SST_Command_UnitMode
- SST_Command_UnitModeChangeRequest
- SST_Command_MachSpeed
- SST_Command_CmdChangeRequest
2. EQUIPMENT SETUP

2.1 Installation

A properly set up system will ensure an easier experience setting up and following the Operation portion of this document (Section 3). The information in this section will provide the information and instructions necessary to set up the Silgan Soft Touch package diverter.

2.1.1 Finger Enclosure

The finger enclosure is to be attached to the side of a customer-supplied conveyor. Choose a point of diversion on the conveyor. A well-chosen diversion point will obtain the best results. Select a point of inspection that is free of excessive vibration, shaking, or inconsistent travel. These adverse conditions will impair the accuracy of the package tracking and diversion.

The point of diversion must meet these requirements:

- The conveyor should be single file. Packages must travel smoothly and well-guided through the inspection unit.
- The conveyor must be a straight path. Bends in the belt path can produce vibrations in the belt motion. These vibrations can affect accuracy of package tracking.
- It is recommended that the So Ō Touch be installed close to the inspection unit. The maximum distance between the inspection unit and the shortest finger of the So Ō Touch is 80 inches.
- Packages should not back up to the point of inspection or rejection in routine production. Backed conveyors will cause the encoder to lose track of packages. Signals from inspection units or sensors may have no accuracy or validity during backed up situations. However, the So Ō Touch does have capabilities to detect and react to package backups.
- Package spacing should allow a minimum of 1.0 inches. This is the space between the end of the maximum width of one package, and the start of the maximum width of the next package. Many jar and bottle geometries guarantee this spacing. Increased spacing will be needed at higher production speeds.
2. EQUIPMENT SETUP

2.1.2 Control Box Stand

Locate the most convenient position for the HMI control box. Position the control box stand in this area. It should allow the connections to reach the finger enclosure. Extending these cables is not recommended. The control box must be in a position where the operator has line-of-sight visibility of the entire system. If it is too far away from the rest of the system, adjustments may become difficult.

The height and angle of the control box is based on customer preference. There are a few tips to help select the best position. To avoid glare from overhead lighting, try positioning the control box at higher elevation and downward angle. To achieve a better view of other equipment or to allow the operator to reach over the conveyor, try lowering the elevation. Lowering the elevation can be achieved by cutting the post as needed. Bolting the tripod feet to the floor can prevent the control box from tipping. Additional anti-tipping measures include the post stabilizing attachment. This is included for optional use. The post stabilizing attachment attaches the post to the side of the conveyor.

2.1.3 Encoder

The encoder must be attached to the conveyor pulley shaft or another part of the conveyor’s drive mechanism. Ensure the shaft or drive mechanism selected is one that drives the same conveyor to the head sensor. Do not attach the encoder to another conveyor.

The encoder attaches to a 5/16” diameter shaft. Smooth shafts are preferred, but threaded shafts can be used. For longer encoder life, try using a precisely machined smaller shaft extending from the larger conveyor shaft.

To achieve an easier solution, a single-ended threaded shaft is included with a 5/16-24 thread. In most cases the best option includes, attaching a 5/16 shaft to the center of the conveyor chain/belt pulley shaft. This can be either on the drive or take up side. A hole can be drilled and tapped into the center of the shaft to attach the single ended threaded shaft. Carefully drill squarely down the center of the shaft. It is ok for the encoder to have some wobble while running. Ensure any wobbling doesn’t cause the anti-rotation attachment to stress the encoder bearing. Verify the cable is not stressed or flexing. Install an anti-rotation attachment appropriate for the wobble of the encoder.

The encoder is moisture resistant. However, wet environments can reduce the lifespan of the encoder. If it is positioned in an area subject to water, frequently falling or sprayed on it, then it should be guarded to reduce the chance of water ingress.
2. EQUIPMENT SETUP

2.1.4 Air Flow Regulator

Locate the most convenient position for the air flow regulator assembly. The hose connecting from the exit of the air flow regulator connects directly to the port on the bottom of the finger enclosure. The inlet port to the air flow regulator is connected to the end user provided air supply line.

The pneumatics of the Soft Touch perform optimally at a pressure of at least 90 PSI. The pressure, however, should not exceed 120 PSI as the high pressure may cause damage to the air cylinders in the finger enclosure. The air supply to the pneumatics of the finger enclosure can be stopped at any point of Soft Touch operation by pressing the emergency stop button on the control box. In the event of a pneumatic emergency, a lockable air shutoff is provided if the entire system needs to be completely de-energized.

2.1.5 Electrical Connections

Encoder Connections

Attach the encoder cable from the control box to the encoder. Contact Silgan if a longer cable extension is needed. Extension cables should be shielded. The Silgan Soft Touch encoder input is optically isolated. The encoder provided operates with 24VDC push/pull quadrature signals. The control box inputs can also handle encoder signals at 5V and 12V levels. This can be configured with jumper positions on CFG1 (Figure 2-2). Single-Ended or quadrature signals can be chosen by making the appropriate jumper settings on CFG1. Only change jumper settings when the power is off. A variety of alternative encoders can be used when needed, due to special installation requirements.

*Note:* The encoder cable is pre-connected to the control box at the factory (Figure 2-1). If substituting encoders, there are requirements to the encoder specs. It is recommended to contact Silgan tech support for help in specifying the correct encoder.

Using a quadrature encoder signal increases the tracking resolution by a factor of four. It also distinguishes between forward and backward rotation. If your conveyor ends up rotating the encoder in the reverse direction, the White (A) and Black (B) wire connections at the control board will need to be swapped (Section 2.2.3).

The CFG1 jumpers will only need to be changed from the factory default positions if an alternate encoder is used. The factory default are 24VDC and Quadrature. Only change these jumper settings when the system power is off.
2. EQUIPMENT SETUP

Encoder outputs are available on CON5-2A. These are repeated signals coming in from the encoder inputs on CON5-1A. These outputs can be useful when using a device that needs an encoder. Instead of mounting two separate encoders to the same conveyor shaft, this encoder output can be connected to the encoder inputs of the device. The encoder output is push/pull, electrically isolated from the Silgan Soft Touch internal power, and can operate with a voltage range of 15 to 32VDC.

Typically, encoder inputs from the other equipment will provide the supply power, intending that the encoder needs power to function. When this is the case, do not make any connections to CON5-2A terminals +24V and 0V.

Figure 2-1: Encoder Cable Connections
2. EQUIPMENT SETUP

Figure 2-2: CFG1 Jumper Settings

Figure 2-3: Encoder Output Connections
2. EQUIPMENT SETUP

Reject Signal Connections

When using the Soft Touch as a package ejector, make the appropriate reject signal connections between the Soft Touch and the inspection unit. When using the Soft Touch as a production distributor, an electrical connection must be made between the inlet sensor and one of the reject inputs if it is being used to detect packages. If an external sensor is being used to detect packages, then its output must be connected to a reject input.

There are four reject inputs available with each one being optically isolated. There are two options for making reject signal connections (Section 1.3). If using Good/Bad paired signals, use adjacent inputs REJA and REJB or REJC and REJD. If using a Bad pulse signal or if the Soft Touch is used as a production distributor, then any input can be used. Power to the reject input may come internally from the Soft Touch power supply or externally, from the inspection unit using any DC voltage up to 24V (Figure 2-4).

![Reject Signal Input Connections](image)

Figure 2-4: Reject Signal Connections

Finger Enclosure / Control Box Connections

A multiconductor cable with male pin connectors is supplied to connect between the finger enclosure and the control box. The cable connection is symmetrical, so either side may be connected to each port. The corresponding female port on the finger enclosure is located on its door and the port on the control box is located on the rear of the box. Ensure that the clamps on each connector are fully clamped down to have a secured electrical connection between each of the finger enclosure and control box.
2. EQUIPMENT SETUP

Remote Emergency Stop Connections

There are connections available to integrate a remote set of emergency stop buttons into the safety circuit of the Soft Touch if requested. The A and B connections for each set of inputs are connected together, using jumpers, by default to complete the safety circuit. If a remote emergency stop button is connected, first remove the jumpers between 1A and 1B and between 2A and 2B (if dual verification is needed). Next, make the remote emergency stop connections. Ensure that the safety circuit is interrupted when each remote emergency stop button is pressed and re-energized when they are all pulled out after the safety reset button is pressed.

Note: SFR1, SFR2, and SFR3 are energized after all emergency stop buttons (local and remote) are pulled out and when the safety reset button is pressed.

![Remote Emergency Stop Connections](image)

Emergency Stop Interface Connections

There are connections available to use the Soft Touch safety circuit as an interface for an external safety circuit or control system. One input, A, and one output, B, are provided. When the Soft Touch safety circuit is energized, there is continuity between A and B. When the safety circuit is interrupted, then there is no continuity between A and B. A maximum of 4 amps is allowed for the incoming signal.

![Emergency Stop Interface Connections](image)
2. EQUIPMENT SETUP

Interface Output Connections

There are four outputs available to interface with other equipment. All outputs are push/pull, totem pole, and electrically isolated from the 2D power (Figure 2-7). They can be used to drive either PNP or NPN outputs. Switching power can be sourced from either the Soft Touch internal power supply, about 2.5 amps available, or from an external power supply using any DC voltage from 10 to 30VDC. The +24V and 0V terminals on the connector are DC power from the Soft Touch. The information available for each output can be configured within the HMI during the setup procedure.

READY: This output is HIGH when the operational prerequisites of the Soft Touch have been met.

RUNNING/EXECUTING: This output is HIGH when the Soft Touch has been started and is in the Execute state.

DIVERTING: This output is HIGH when the Soft Touch is running and is diverting packages.

NOT DIVERTING: This output is HIGH when the Soft Touch is running and is passing packages.

INLET JAM: This output is HIGH when the Soft Touch has detected an inlet jam and the fault has not been cleared yet.

EXIT JAM: This output is HIGH when the Soft Touch has detected an exit jam and the fault has not been cleared yet.

HELD: This output is HIGH when the Soft Touch has transitioned from the Execute State to the Held State.

SUSPENDED: This output is HIGH when the Soft Touch has transitioned from the Execute State to the Suspended State.

![Interface Output Connections](image)

Figure 2-7: Interface Output Connections
2. EQUIPMENT SETUP

2.2  Initial Start Up

The Silgan Soft Touch is shipped with two power switch keys tied to a cable inside the control box. Remove one of the keys and insert it into the power switch. Keep the other key stored inside the control box as a backup. Close the cover of the control box. Plug the power cord into a 120VAC GFI protected outlet. Turn on the power switch.

2.2.1  Verify the Optical Sensor Operation

Place an object in front of one or both of the optical sensors. When the sensor detects a target within its range of view, the green package sensor LED on the front panel will light.

2.2.2  Verify the Air Pressure Reading

Ensure that the air pressure regulator is allowing air to enter the finger enclosure and that the system has been reset. If there is sufficient air pressure, then the green air pressure LED on the front panel will light. To verify that the value of the air pressure, navigate to the Run Monitor screen and inspect the air pressure graph on the bottom left corner of the screen.

2.2.3  Verify the Encoder Operation

Turn on the conveyor. This will cause the encoder to rotate. The green encoder LED should light up when pulses are coming in from the encoder. If quadrature signals are being used, direction of rotation matters. If the led does not light when the encoder is rotating, swap the wires connected to encoder. These are inputs CON5-1A terminals A+ and B+, white and black wires. This will reverse the perceived direction of encoder rotation. Ensure that the LED lights when the conveyor is running after this change.
3. OPERATIONS

3.1 Operations

Power up the system. The machine will initialize. The intro logo screen will appear on the HMI. Touch anywhere on this screen and the MAIN MENU will appear.

3.1.1 Operating States

Identify the current state by viewing the screen diagram. The current state should be highlighted and active (Figure 3-1).

Current State:

EXECUTE: Press STOP to change the state to STOPPED (Item 2).

STOPPED: Press RESET then START. The state will change to EXECUTE (Items 1 and 3).

EXECUTE: Press HOLD. The state will change to HELD (Item 4).

HELD: Press START. The state will change to EXECUTE (Item 1).

Press home button to return to the Main Menu (Item 5).

Figure 3-1: PackML Operating States
3. OPERATION

3.1.2 Operating Modes

The HMI display shows the Soft Touch Operating Modes. These modes govern how the diversion functions are operating. The currently active mode will have its respective button lit on the screen (Figure 3-2).

**MAINTENANCE:** Press button to activate (Item 1). In this mode, the Soft Touch is not actively diverting packages. Operations testing may be conducted in the Test Operations menu. **MAINTENANCE Mode** can only be entered if the operating state is **STOPPED**.

**SETUP/ADJUST:** Press button to activate (Item 2). The Soft Touch must be in this mode to allow changes to configuration parameters. Diversion operations will occur in SETUP mode.

**PRODUCTION:** Press button to activate (Item 3). In this mode, diversion operations are performed as configured. Parameter changes are not allowed.

**DIVERT NONE:** Press button to activate (Item 4). In this mode, no package will be diverted.

**DIVERT NORMAL:** Press button to activate (Item 5). In this mode, the Soft Touch will divert packages as configured.

**DIVERT ALL:** Press button to activate (Item 5). In this mode, all packages will be diverted.

![Figure 3-2: Operation Control Screen and Operating Modes](image-url)
3. OPERATION

3.1.3 Set Up a New Configuration

Prior to setting up a new configuration, consult the Password Protection section of this document (Section 3.1.7). To set up a new configuration, ensure the Soft Touch is in the STOPPED operating state.

1. The red STOP button should be lit up solid (Figure 3-3)
2. Put the Soft Touch in SETUP MODE.
3. Set the divert mode to NORMAL.
4. Navigate to the MAIN MENU.
5. From the MAIN MENU, select the SETUP PARAMETERS SELECT (Figure 3-4).
6. From the SETUP PARAMETERS menu, select the INITIAL SETUP PARAMETERS menu (Figure 3-5).

Note: All setup screens have text and help buttons that will give you guidance on the steps needed to be performed on each screen, and descriptions of the settings to be adjusted.

![Figure 3-3: Operation Control Screen](image)

![Figure 3-4: Main Menu](image)
## 3. OPERATION

**Figure 3-5: Setup Parameters Menu**

**Figure 3-6: Initial Setup Parameters Menu**
3. OPERATION

Diversion Operation

1. Press DIVERSION OPERATION to enter the operation screen.

2. DIVERSION OPERATION sets the primary runtime operation of the Soft Touch. Direction of product flow within the Soft Touch. The default setting is PACKAGE EJECTOR. If the Soft Touch will be used for production distribution, then the diversion operation is set to PRODUCTION DISTRIBUTOR.

3. Press NEXT to advance to the next screen.

*DIVERSION OPERATION*

PRESS THE OPERATION BUTTON TO SELECT THE TYPE OF DIVERSION. WHEN USING THE SOFT TOUCH AS A STANDARD EJECTOR FOR BAD PACKAGES OR FOR QC PURPOSES, SELECT "PACKAGE EJECTOR". WHEN USING THE SOFT TOUCH TO PASS AND DIVERT A PRESELECTED NUMBER OF PACKAGES IN A CONTROLLED MANNER, SELECT "PRODUCTION DISTRIBUTOR".

![Diagram of Diversion Operation]

Figure 3-7: Diversion Operation
3. OPERATION

Package Flow Direction

1. PACKAGE FLOW DIRECTION sets the direction of package flow within the Soft Touch. The default setting is LEFT TO RIGHT which interprets incoming packages entering from the left side (**Figure 3-8**). If incoming package enters from the opposite direction, the fingers need to be removed and reinstalled in the opposite orientation. Following this, the package flow direction can be set to RIGHT TO LEFT.

2. Press the menu button to return to INITIAL SETUP PARAMETERS.

**Figure 3-8: Package Flow Direction**
Inward/Outward Position Adjustment

1. Enter the **SETUP PARAMETERS** menu.
2. Press **POSITION ADJUSTMENT** to enter the positioning menu.
3. Press **INWARD ENCLOSURE** to enter the positioning screen.
4. The **INWARD ENCLOSURE** position is adjusted by loosening the handle at the bottom of the finger enclosure and moving the enclosure along the shaft. The ideal position is such that the face of each finger intercepts the package when extended. Positioning the enclosure too inward can cause packages to intercept the edges of the fingers when extended. Positioning the enclosure too outward can cause packages to miss the fingers when extended. When the position has been determined, tighten the handle at the bottom of the finger enclosure. To verify smooth transition, consider entering **MAINTENANCE MODE** and then navigating to **TEST FINGERS (FORCE)** to force the desired enabled fingers down. Once in the downward position pass a package to verify that it intercepts the face of each finger.
5. Press **PREV** to return to **POSITION ADJUSTMENT**.

![Figure 3-9: Position Adjustment Selection](image)

![Figure 3-10: Inward Enclosure Position](image)
3. OPERATION

Vertical Position Adjustment

1. Press VERTICAL ENCLOSURE to enter the positioning screen.

2. The VERTICAL ENCLOSURE position is adjusted by the crank at the bottom of the finger enclosure. The ideal vertical finger enclosure position is such that the fingers divert the package smoothly when extended. Positioning the enclosure too low or too high can cause the package to fall forward when the fingers are extended. When the position has been determined, tighten the handle at the bottom of the finger enclosure. To verify smooth transition, consider entering MAINTENANCE MODE and then navigating to TEST FINGERS (FORCE) to force the desired enabled fingers down. Once in the downward position pass a package at varying speeds to verify that it does not fall when it intercepts each finger. After the ideal position has been determined, return to the VERTICAL ENCLOSURE screen and enter the position in inches by referencing the increment markings.

3. Press PREV to return to POSITION ADJUSTMENT.

Figure 3-11: Position Adjustment Selection

Figure 3-12: Vertical Enclosure Position
3. OPERATION

Optical Sensor Position Adjustment

1. Press OPTICAL SENSOR to enter the positioning screen.

2. The OPTICAL SENSOR position is adjusted in two dimensions. First, place a package in front of the sensor. To adjust the vertical position, loosen the vertical set screw using a socket or adjustable wrench. Set the sensor to the ideal vertical position and tighten the set-screw. To adjust the horizontal position, loosen the two horizontal set screws using a socket or adjustable wrench. Set the sensor to the ideal horizontal position and tighten the set screws. To verify detection, pass a package through the Soft Touch and check that the LED interface for each sensor lights up when it is within the sensors’ range. Enter the positions in inches by referencing the increment markings in each dimension. It is important that the sensor positioning is set correctly as it affects several setup sequences and features. Examples of these include ENCODER MAPPING, REJECT SIGNAL DISTANCE, PRODUCTION DISTRIBUTION, JAM DETECTION, QC SAMPLING, and STATISTICS.

3. Press PREV to return to POSITION ADJUSTMENT.

4. Press the menu button to return to SETUP PARAMETERS.

Figure 3-13: Position Adjustment

Figure 3-14: Optical Sensor Position
3. OPERATION

Encoder Mapping

1. Enter the INITIAL SETUP PARAMETERS menu.
2. Press ENCODER MAPPING to enter the encoder screen.
3. **ENCODER MAPPING** determines the number of encoder pulses that correspond to 0.1 inches of straight conveyor travel. The reason for this setting is so that the tracking resolution of the Soft Touch can be set.
4. Press the sequence button to begin. If it is desired to stop the sequence after it has been started, press the same button cancel it.
5. Run the conveyor at a steady speed.
6. Pass a single package through the inlet sensor. The sequence will conclude after the package passes the position of the exit sensor.
7. Repeat the sequence as necessary. To enter a desired encoder pulse value, press the numeric entry button and enter the value. Ensure that the sequence is not running when entering the value. Consider navigating to the **RUN MONITOR** to observe the conveyor speed and verifying it with a tachometer.
8. Press **NEXT** to advance to the next screen.

![Figure 3-15: Encoder Mapping](image1)

![Figure 3-16: Encoder Mapping](image2)
3. OPERATION

Reject Input Enable

1. **REJECT INPUT ENABLE** determines which reject inputs are used during normal operation. When the Soft Touch is used as a package ejector, ensure that the reject signals from the inspection unit are wired to the correct inputs on the backboard PCB of the Soft Touch control box prior to enabling. Since this setting is an initial setup parameter, it will never need to be adjusted again unless it is desired to change the incoming reject signals from the inspection unit. When the Soft Touch is used as a production distributor, ensure that the inlet sensor and reject input are connected (if an external sensor is not used).

   a. If it is intended to use a single pulse to indicate bad packages or if Production Distribution is selected, then any of the four reject signals can be used.

   b. If it is intended to use good and bad paired signals to indicate the status of packages, then only adjacent pairs can be used (i.e. A and B or C and D).

2. Press NEXT to advance to the next screen.

\[ Figure 3-17: \text{Bad Pulse or Production Distributor} \]

\[ Figure 3-18: \text{Good/Bad Paired} \]
3. OPERATION

Reject Signal Type

1. **REJECT SIGNAL TYPE** determines how a reject signal from an inspection unit is interpreted. This setting is only configurable when the diversion operation is set to package ejector. Ensure that the reject signals from the inspection unit are wired to the correct inputs on the backboard PCB of the Soft Touch control box prior to assigning. Since this setting is an initial setup parameter, it will never need to be adjusted again unless it is desired to change the incoming reject signals from the inspection unit.

   a. If it is intended to use a single pulse to indicate bad packages, then assign **BAD PULSE** for the corresponding reject.

   b. If it is intended to use good and bad paired signals to indicate the status of packages, then assign **GOOD SIGNAL** for the reject that will be active for good packages and then assign **BAD SIGNAL** for the reject that will be active for bad packages.

2. Press **NEXT** to advance to the next screen.

![Figure 3-19: Bad Pulse](image)

![Figure 3-20: Good/Bad Paired](image)
3. OPERATION

Air Pressure Monitor

1. **AIR PRESSURE MONITOR** allows for an alert message to signal when the air pressure goes below a certain threshold. Since this setting is an initial setup parameter, it will never need to be adjusted again unless it is desired to disable monitoring.

2. Press the enable button to enable or disable air pressure monitoring.

3. Press on the **MIN AIR PRESSURE** entry button to enter a value for the minimum acceptable air pressure setpoint.

4. Press **NEXT** to advance to the next screen.

![Figure 3-21: Air Pressure Monitor](image1)

![Figure 3-22: Low Air Pressure Fault Message](image2)
3. OPERATION

Interface Outputs

1. INTERFACE OUTPUTS allows for the assignment of information from the Soft Touch to the PCB of the control box. This information can be used in a variety of ways such as lighting a signal light, energizing a contact, or sending a signal to an external machine. Ensure that the wiring for the external devices is complete prior to assigning INTERFACE OUTPUTS. The default setting for all four interface outputs is NONE. Since this setting is an initial setup parameter, it will never need to be adjusted again unless it is desired to disable or change the INTERFACE OUTPUTS.

2. Press the selector list and select the information of interest. To confirm the selection press on the checkmark button next to the selector list.

3. Press on the SET INTF button to set the selection to a specific output. When this is done, the selection will appear above the assigned output.

4. Repeat Steps (2-3) as necessary.

5. Press the menu to return to INITIAL SETUP PARAMETERS.

Figure 3-23: Dropdown Selection

Figure 3-24: Assignment
3. OPERATION

Finger Enable

1. Enter the **SETUP PARAMETERS** menu.
2. Press **FINGER ENABLE** to enter the finger enabling screen.
3. **FINGER ENABLE** determines which fingers are used during runtime. FG1 always corresponds to the shortest finger and FG12 always corresponds to the longest finger. A reason for disabling certain can be related to the width of the conveyor. Depending on the width, it may be sufficient to use less fingers to divert a package than all twelve. When a finger is disabled, its corresponding input entries in **ADVANCED RESPONSE DOWN** and **ADVANCED RESPONSE UP** become inaccessible. To verify the desired fingers are enabled, consider entering **MAINTENANCE MODE** and then navigating to **TEST FINGERS (CYCLE)** to automatically cycle through each enabled finger.
4. Press **NEXT** to advance to the next screen.

![Figure 3-25: Finger Enable](image-url)
3. OPERATION

Advanced Response Down

1. **ADVANCED RESPONSE DOWN** determines the time in which a finger will begin to extend downwards before the package reaches it. The reason for these entries is to give the fingers some time to reach a downward state before the package intercepts them. Press on a finger response to enter a value in milliseconds for each finger. Setting too high of a value will cause the fingers to reach a downward position too early and interfere with the package ahead of the rejected one. Setting too low of a value will cause the fingers to reach a downward position too late and push the package instead of diverting it. It is recommended to have lower response times for shorter fingers and higher response times for longer fingers. The advanced downward response time is invariant to the speed of the conveyor, meaning that it will be consistent at all speeds.

2. Press **NEXT** to advance to the next screen.

*Figure 3-26: Advanced Response Down*
3. OPERATION

Advanced Response Up

1. **ADVANCED RESPONSE UP** determines the time in which a finger will begin to retract upwards after a portion of the diversion width of the package has passed. The reason for these entries is to give the fingers some time to reach an upward state before a passing package reaches them following a diversion. Press on a finger response to enter a value in milliseconds for each finger. Setting too high of a value for a finger may cause the finger to reach an upward position too early and not fully divert a package. Setting too low of a value or zero for a finger may cause the fingers to reach an upward position too late and interfere with the package following a diverted one. It should be noted that at high speeds for small-width packages, that fingers with high advanced response times may become temporally disabled. It is recommended to have lower response times for shorter fingers and higher response times for longer fingers. The advanced upward response time is invariant to the speed of the conveyor, meaning that it will be consistent at all speeds.

2. Press **NEXT** to advance to the next screen.

![Advanced Response Up](image)

*Figure 3-27: Advanced Response Up*
3. OPERATION

Package Width Maximum

1. Press MAX to enter the maximum width screen.

2. The MAXIMUM WIDTH is set to the maximum width of current package type in inches. Different package types have the maximum width in several areas. Examples of locations of the maximum width include the base of the package, the top of the package, and the midsection of the package. Press the numeric entry button to enter the MAXIMUM PACKAGE WIDTH in inches. The MAXIMUM PACKAGE WIDTH has a resolution up to 1/10 of an inch. If certain widths are beyond this resolution, rounding the widths to the nearest tenth is appropriate. For example, if the width is measured to be 2.75 inches, the entered width would be 2.8 inches.

3. Press PREV to return to PACKAGE WIDTH.

Figure 3-28: Package Width Selection

Figure 3-29: Maximum Width
3. OPERATION

Package Width Diversion

1. Press DIVERT to enter the diversion width screen.

2. The DIVERSION WIDTH is the width of the package that is referenced while the Soft Touch is running. The default percentage value is 100%, meaning that the Soft Touch will interpret the width of the package as its maximum width. However, in situations where spacing between packages is low, there may be unintentional finger interference with good packages. When this occurs, the DIVERSION WIDTH percentage can be set to a value set to a value less that 100%. By doing this, the Soft Touch will interpret the width of the package as less than its maximum width while it is running. Press the numeric entry button to enter the DIVERSION WIDTH percentage.

3. Press PREV to return to PACKAGE WIDTH.

4. Press NEXT to advance to the next screen.

Figure 3-30: Package Width Selection

Figure 3-31: Diversion Width
3. OPERATION

Reject Signal Distance

1. The **REJECT SIGNAL DISTANCE** determines the distance between the reject signals from the inspection unit or sensor to the fingers of the Soft Touch. The reason for this set of entries is because different size packages send the reject signals to the Soft Touch at different locations. Given this, it is necessary that the distance be set so that the Soft Touch can track the travelling packages accurately. Press on an individual reject signal to determine the **REJECT SIGNAL DISTANCE**.

2. Ensure the inspection unit or sensor is ready to send the appropriate reject signal. To verify this, pass a package through it and check the LED interface to see if the proper signal has been sent.

3. Press the sequence button to begin. If it is desired to stop the sequence after it has been started, press the same button cancel it.

4. Run the conveyor at a steady speed.

5. Pass a single package through the inspection unit or sensor. The sequence will conclude after the package passes the position of the inlet sensor. Repeat the sequence as necessary.

6. To enter a desired distance, press the numeric entry button and enter the value. Ensure that the sequence is not running when entering the value.

7. Press **PREV** to return to **REJECT SIGNAL DISTANCE**.

8. To determine the distances for other reject signals repeat Steps (1-6). If a Good/Bad signal configuration is used, the distance value for the paired signal will be updated automatically at the end of a sequence.

9. Press **NEXT** to advance to the next screen.
3. OPERATION

**Figure 3-32: Reject Signal Distance Selection**

**REJECT SIGNAL DISTANCE**

Select a reject signal to determine its distance in inches from the inspection unit to the first finger.

**Figure 3-33: Distance Sequence (Activated)**

**REJECT A SIGNAL DISTANCE**

The reject signal distance sequence determines the distance between the inspection unit and the first finger. Press the sequence button to start the sequence. Next, pass a package through the inspection unit and the soft touch. When the bottle exits the inlet sensor, the sequence will be complete. To enter a manual distance, press the numeric entry button.

**Figure 3-34: Distance Sequence (Completed)**

**PRESS TO RUN**

Press to run.

Press to cancel.
3. OPERATION

Jam Detection

1. **JAM DETECTION** allows the optical sensors to be used to determine jams or backups along the conveyor. The types of jams that can be detected are inlet jams and exit jams. Inlet jams occur when there is a backup at the inlet of the Soft Touch and exit jams occur when there is a backup at the exit of the Soft Touch. The configuration parameters for each type of jam detection are identical. Enter the **INLET** or **EXIT** to configure jam detection parameters.

2. Press the enable button to enable the type of jam detection.

3. (Optional) A sensor-driven timer is set and reset with each passing package along the conveyor. If the timer reaches its maximum preset and the sensor detects the same package, a jam is inferred. False jams may be detected if there is significant slippage of each package. To compensate for this, press the keypad entry button to add time padding in milliseconds to the auto-calculated jam time preset.

4. Press **NEXT** to advance to **JAM REACTION**.

5. When a jam is detected, the Soft Touch can be programmed to react in a specific manner. There are 3 reactions that can be selected whenever a jam occurs: **NORMAL FUNCTION**, **FINGERS UP**, and **FINGERS DOWN**.

   a. If **NORMAL FUNCTION** is selected, the Soft Touch will operate under the normal configured parameters when a jam is detected and remain in the **EXECUTE** state.

   b. If **FINGERS UP** is selected, the Soft Touch will retract all enabled fingers when a jam is detected and transition to the **SUSPENDED** state.

   c. If **FINGERS DOWN** is selected the Soft Touch will extend all enabled fingers when a jam is detected and transition to the **SUSPENDED** state.

6. Press **NEXT** to advance to the **JAM DETECTION** selection menu.

7. Repeat Steps (1-5) to configure **JAM DETECTION** for the opposite selection.

8. If “Package Ejector” is selected, press the menu button to return to **SETUP PARAMETERS**. If not, then press **NEXT** to advance to the next screen.
3. OPERATION

**PACKAGE JAM DETECTION**
Select the configuration screens to enable and adjust inlet and exit jam detection parameters.

**EXIT JAM DETECTION**
Press the enable button to detect an exit jam. Use the entry button to enter time padding in milliseconds to add to the auto calculated jam time for the current product type. Enter the next screen to select an action in response to an exit jam.

**EXIT JAM REACTION**
Press the jam action type button to set an action to perform in the event of an exit jam. Be aware of any possible external hazards before selecting an action.

- NORMAL FUNCTION: Soft touch will continue to operate with existing settings (default selection).
- FINGERS UP: Soft touch will pass all packages entering until jam is removed and fault is cleared.
- FINGERS DOWN: Soft touch will divert all packages entering until jam is removed and fault is cleared.
3. OPERATION

Production Distribution Settings

1. PRODUCTION DISTRIBUTION SETTINGS determines how many packages will be passed and diverted periodically during runtime when “Production Distributor” is selected.

2. Press the numeric entry button to enter the number of packages to pass.

3. Press the numeric entry button to enter the number of packages to divert.

4. (Optional) Press on the DIVERT AT STARTUP button if it is preferred for the Soft Touch to initially divert packages instead of passing them.

5. Press the menu button to SETUP PARAMETERS.

---

**Figure 3-38: Pass at Startup**

**Figure 3-39: Divert at Startup**
3. OPERATION

Run Monitor Data Windows

1. Enter the INITIAL SETUP PARAMETERS menu.
2. Press RUN MONITOR DATA WINDOWS to enter the window screen.
3. RUN MONITOR DATA WINDOWS allows for quick access to informational popup window screens in the RUN MONITOR. The reason for these assignments is to provide desired information without having to navigate across various screens. A maximum of four data windows can be assigned to the RUN MONITOR. The default setting for all four data windows is NONE. Since this setting is an initial setup parameter, it will never need to be adjusted again unless it is desired to disable or change the RUN MONITOR DATA WINDOWS.
4. Press the selector list and select the information of interest. To confirm the selection press on the checkmark button next to the selector list.
5. Press on the SLOT button to set the selection to a specific location. When this is done, the selection will replace the contents of the slot.
6. Repeat Steps (1-3) as necessary.
7. Press the menu button to return to INITIAL SETUP PARAMETERS.
3. OPERATION

**RUN MONITOR DATA WINDOWS**

Press on the selector list to view options for run monitor window displays. Select an option and press the checkmark button to confirm the selection. Next, choose and press on a slot location to assign the selection. Maximum selections: 4.

<table>
<thead>
<tr>
<th>REJECT SIGNALS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>NONE</td>
<td></td>
</tr>
<tr>
<td>REJECT SIGNALS</td>
<td>SLOT 4</td>
</tr>
<tr>
<td>ENABLED FINGERS</td>
<td></td>
</tr>
<tr>
<td>ADVANCED RESPONSES</td>
<td></td>
</tr>
<tr>
<td>PACKAGE WIDTH</td>
<td></td>
</tr>
</tbody>
</table>

*Figure 3-40: Dropdown Selection*

**RUN MONITOR DATA WINDOWS**

Press on the selector list to view options for run monitor window displays. Select an option and press the checkmark button to confirm the selection. Next, choose and press on a slot location to assign the selection. Maximum selections: 4.

<table>
<thead>
<tr>
<th>REJECT SIGNALS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SELECTED</td>
<td></td>
</tr>
<tr>
<td>REJECT SIGNALS</td>
<td>SLOT 2, SLOT 3, SLOT 4</td>
</tr>
</tbody>
</table>

*Figure 3-41: Assignment*
3. OPERATION

Summary of the Setup Procedure

Turning the Soft Touch ON for the first time:
1. Diversion Operation
2. Package Flow Direction
3. Position Adjustment
4. Encoder Mapping
5. Reject Input Enable
6. Reject Signal Type (as a Package Ejector)
7. Air Pressure Monitor
8. Interface Outputs
9. Finger Enable
10. Advanced Response Down
11. Advanced Response Up
12. Package Width
13. Reject Signal Distance
14. Jam Detection
15. Production Distribution Settings (as a Production Distributor)
16. Run Monitor Data Windows

New Settings Following Initial Configuration:
1. Position Adjustment
2. Finger Enable
3. Advanced Response Down
4. Advanced Response Up
5. Package Width
6. Reject Signal Distance
7. Jam Detection
8. Production Distribution Settings (as a Production Distributor)
3. OPERATION

3.1.4  Save or Recall a Job File

Configurations for various package types can be saved to a job file. These job files can be recalled at a later date. The next time a certain size and style combination is run, the associated job file can be recalled. This reduces time and effort avoiding set up for each run (*Figure 3-42)*.

1. Put the unit into **Setup/Adjust Mode**. At the **Main Menu Screen**, select **Job File Save/Recall**.
2. This field will display the name of the current running configuration file. Select this field to enter a new name or edit the existing name.
3. There are forty job file locations available. Select the up or down arrows to step through the file locations. Each filename will appear in the Job File Name field as you scroll.
4. Select this button to save the current configuration to the displayed Job File Number. A request to confirm the action will be made prior to saving.
5. Select this button to recall the displayed Job File Number to the current configuration. A request to confirm the action will be made prior to recalling the file.
6. Select this button to return to the main menu. Put the unit back into Production Mode.

**Note:** Job file memory locations are defined by the Job File Number, and not the Job File Name. Two job files can be given the same name and saved to different file number locations.

**Note:** The Soft Touch must be in the stopped state to recall a job file.

---

*Figure 3-42: Job File Save/Recall*
3. OPERATION

3.1.5 Performing Maintenance Testing Operations

To perform maintenance testing, ensure the Soft Touch is in the STOPPED operating state.

1. The red STOP button should be lit up solid (Figure 3-43).
2. Put the Soft Touch in MAINTENANCE MODE. The DIVERT MODE is not applicable when performing testing, but when changing back to SETUP MODE or PRODUCTION MODE, it will be automatically set to DIVERT NORMAL.
3. Navigate to the MAIN MENU.
4. From the MAIN MENU, select the MAINTENANCE SETTINGS SELECT (Figure 3-44).
5. From the MAINTENANCE MENU, select the TEST OPERATIONS menu (Figure 3-45).
3. OPERATION

**MAINTENANCE MENU**
- PLC INPUTS MONITOR (ALL)
- PLC INPUTS MONITOR (1-14)
- PLC INPUTS MONITOR (15-27)
- PLC ANALOG MONITOR
- INTF-OUTPUTS MONITOR
- AIR PRESSURE MONITOR
- ADV RESPONSE MONITOR

**TEST OPERATIONS**
- TEST FINGERS (FORCE)
- TEST FINGERS (CYCLE)
- TEST SIGNAL LIGHT
- TEST INTERFACE OUTPUTS
- MAINTENANCE MENU

*Figure 3-45: Maintenance Menu*

*Figure 3-46: Test Operations Menu*
3. OPERATION

Test Fingers Force

1. Press TEST FINGERS (FORCE) to enter the test screen.

2. TEST FINGERS (FORCE) allows for extension of any desired finger. To perform testing, press the enable button and it will light up displaying FORCING ENABLED.

3. Press on any desired finger to extend. FG1 always corresponds to the shortest finger and FG12 always corresponds to the longest finger. If a finger has been extended, press on the same button corresponding to that finger to retract it.

4. Press on the enable button again to disable test forcing the fingers. The enable button will then dim and display FORCING DISABLED. Any extended fingers will be immediately retracted.

5. Press the menu button to return to TEST OPERATIONS.

![Figure 3-47: Disabled](image)

![Figure 3-48: Enabled with Forced Fingers](image)
3. OPERATION

Test Fingers Cycle

1. Press TEST FINGERS (CYCLE) to enter the test screen.
2. TEST FINGERS (CYCLE) allows a controlled extension and retraction cycle for all enabled fingers. If a finger is not enabled, it will not be tested within the cycle. To perform testing, press the enable button and it will light up displaying CYCLING ENABLED.
3. Press on any of the speed buttons to set the cycle speed.
4. Press on the enable button again to disable test cycling the fingers. The enable button will then dim and display CYCLING DISABLED. Any extended fingers will be immediately retracted.
5. Press the menu button on the bottom right corner to return to TEST OPERATIONS.
3. OPERATION

Test Signal Light

1. Press TEST SIGNAL LIGHT to enter the test screen.

2. TEST SIGNAL LIGHT allows the testing of the various colors of the signal light. To perform testing, press the enable button and it will light up displaying TESTING ENABLED.

3. There are two methods of testing the signal light. To switch in between testing methods, press the button of the opposite test method.
   
   a. To test a specific color, press on the directional arrows to navigate to the color.
   
   b. To test cycle all colors, press the button labeled CYCLE ALL.

4. Press on the enable button again to disable testing the signal light. The enable button will then dim and display TESTING DISABLED. The signal light will immediately revert to the color blue.

5. Press the menu button on the bottom right corner to return to TEST OPERATIONS.

---

**Figure 3-51: Disabled**

**Figure 3-52: Enabled**
3. OPERATION

Test Interface Outputs

1. Press TEST INTERFACE OUTPUTS to enter the test screen.

2. TEST INTERFACE OUTPUTS allows the testing of the selected interface outputs. When testing interface outputs, the enabling the testing operation will immediately overwrite the current state of the output. Be aware of any interconnected machinery or devices when testing. To perform testing, press the enable button and it will light up displaying TESTING ENABLED.

3. Press on any desired interface output to test. If an interface output is being forced, press on the same button corresponding to that output to disable it.

4. Press on the enable button again to disable testing the interface outputs. The enable button will then dim and display TESTING DISABLED. The interface outputs will revert to their states prior to being tested.

5. Press the menu button on the bottom right corner to return to TEST OPERATIONS.

Figure 3-53: Disabled

Figure 3-54: Enabled and Testing INTF-1
3. OPERATION

3.1.6 Performing QC Sampling

To perform QC Sampling ensure the Soft Touch is in the EXECUTING operating state.

1. The green START button should be lit up solid (Figure 3-55).
2. Put the Soft Touch in SETUP MODE or PRODUCTION MODE.
3. Set the divert mode to DIVERT NORMAL.
4. Navigate to the MAIN MENU.
5. From the MAIN MENU, select the QC SAMPLING (Figure 3-56).

Note: All additional features have text and help buttons that will give you guidance on the steps needed to be performed on each screen, and descriptions of the settings to be adjusted.

Figure 3-55: Operation Control Screen

Figure 3-56: Main Menu
3. OPERATION

QC Sampling

1. **QC SAMPLING** allows for the sampling of packages using the optical sensors for a controlled diversion during production. The number of real-time packages detected below and up to the setpoint will be diverted. Press the enable button to begin QC Sampling.

2. Pass packages along the conveyor through the Soft Touch. The number of detected packages by the inlet optical sensor is displayed under **DETECTED**.

3. When the number of detected packages is equal to the setpoint, QC Sampling will automatically disable. QC Sampling can also be disabled by toggling the enable button.

4. Press the menu button on the bottom right corner to return to **MAIN MENU**.

![Disabled](image1)

**Figure 3-57: Disabled**

![Enabled](image2)

**Figure 3-58: Enabled**
3. OPERATION

QC Diversion Setpoint

1. Enter the QC SAMPLING from the MAIN MENU.
2. Press QC SETUP PARAMETERS to enter the adjustment screen.
3. QC DIVERSION SETPOINT allows for the adjustment of the number of packages to divert during QC Sampling. Press on the numeric entry button to adjust the number of package units to divert prior to passing.
4. Press PREV to return to QC SAMPLING.

Figure 3-59: QC Setup Parameters

Figure 3-60: QC Diversion Setpoint
3. OPERATION

Sensor Calibration

1. Navigate to OPERATION CONTROL and set the Soft Touch to the Stopped State and in SETUP MODE. Press PREV to return to the MAIN MENU.

2. Enter QC SAMPLING from the MAIN MENU.

3. Press QC SETUP PARAMETERS and NEXT until the SENSOR CALIBRATION screen is reached.

4. SENSOR CALIBRATION recalibrates the optical sensors for the current package type to increase the accuracy of diversion and passing during QC Sampling. The value that is determined in this sequence is the sensing width of the package. The reason for this is that based on the geometry of the package, the optical sensors may be able to detect a certain width of the package. This sequence may be done if the optical sensor positions have changed or if there is visible inaccuracy when performing QC Sampling. Press the sequence button to begin. If it is desired to stop the sequence after it has been started, press the same button cancel it.

5. Run the conveyor at a steady speed.

6. Pass a single package through the inlet sensor. The sequence will conclude after the package passes the position of the inlet sensor.

7. Repeat the sequence as necessary.

8. To enter a desired width, press the numeric entry button and enter the value. Ensure that the sequence is not running when entering the value. It should be noted that the sensing width is never greater than the maximum width of the package.

9. Press NEXT to advance to QC SAMPLING.
3. OPERATION

SENSOR CALIBRATION
THE SENSOR CALIBRATION SEQUENCE CALIBRATES THE INLET SENSOR BY MEASURING THE AMOUNT OF THE PACKAGE THAT IT DETECTS. PRESS THE SEQUENCE BUTTON TO START THE SEQUENCE. NEXT, PASS A PACKAGE THROUGH THE INLET SENSOR. WHEN IT EXITS THE SENSOR, THE SEQUENCE WILL BE COMPLETE. TO ENTER A MANUAL VALUE, PRESS THE NUMERIC ENTRY BUTTON.

PRESS TO RUN

Figure 3-61: Sensor Calibration

SENSOR CALIBRATION
THE SENSOR CALIBRATION SEQUENCE CALIBRATES THE INLET SENSOR BY MEASURING THE AMOUNT OF THE PACKAGE THAT IT DETECTS. PRESS THE SEQUENCE BUTTON TO START THE SEQUENCE. NEXT, PASS A PACKAGE THROUGH THE INLET SENSOR. WHEN IT EXITS THE SENSOR, THE SEQUENCE WILL BE COMPLETE. TO ENTER A MANUAL VALUE, PRESS THE NUMERIC ENTRY BUTTON.

CALIBRATING
PRESS TO CANCEL

Figure 3-62: Calibration Active

SENSOR CALIBRATION
THE SENSOR CALIBRATION SEQUENCE CALIBRATES THE INLET SENSOR BY MEASURING THE AMOUNT OF THE PACKAGE THAT IT DETECTS. PRESS THE SEQUENCE BUTTON TO START THE SEQUENCE. NEXT, PASS A PACKAGE THROUGH THE INLET SENSOR. WHEN IT EXITS THE SENSOR, THE SEQUENCE WILL BE COMPLETE. TO ENTER A MANUAL VALUE, PRESS THE NUMERIC ENTRY BUTTON.

PRESS TO RUN

Figure 3-63: Calibration Complete
3. OPERATION

3.1.7 Password Protection

The Soft Touch provides the option to enable password protection when entering Setup Mode. Since Setup Mode provides direct access to the adjustment of setup parameters, job files, and statistical data, there may be a desire to reserve access to this mode for qualified personnel. When setting a password, there is a maximum limit of 16 characters. If a password is lost or forgotten, a master password can be used to enter Setup Mode and set a new password. Contact Silgan if the master password is needed.

1. Put the Soft Touch in SETUP MODE (Figure 3-64).
2. Navigate to the MAIN MENU.
3. From the MAIN MENU, press NEXT to navigate to the secondary MAIN MENU (Figure 3-65).
4. From the Secondary MAIN MENU, select PASSWORD SETTINGS (Figure 3-66).
5. Press the PASSWORD ENABLE button (Figure 3-67).
6. Enter a password in the text entry window.
7. Press the SET button to set the password.

![Figure 3-64: Operation Control](image-url)
3. OPERATION

Figure 3-65: Primary Main Menu

Figure 3-66: Secondary Main Menu

Figure 3-67: Password Settings
## 4. TROUBLESHOOTING

### 4.1 Troubleshooting

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible Cause</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLC Program Crash / No Outputs are Energized</td>
<td>1. HMI input value(s) caused an error in the PLC logic. 2. Damaged hardware caused an error in the PLC logic.</td>
<td>1. Move switch on the PLC from “RUN” to “PRG” back and forth until the fault light clears. Set the switch to “PRG” and check the HMI inputs. Change the suspected faulty HMI value(s) and set the switch to “RUN”. Power cycle the Soft Touch. 2. Move the switch on the PLC from “RUN” to “PRG” back and forth until the fault light clears. Press the EStop button and set the switch to “RUN”. In the Maintenance Menu, check the PLC digital inputs and analog inputs for erroneous values. Check suspected hardware and determine if replacement is needed.</td>
</tr>
<tr>
<td>Communication Error on HMI Screen</td>
<td>1. Communication cable is disconnected or damaged.</td>
<td>2. Inspect the communication cable and its connections to the HMI and PLC. Determine if a replacement is needed.</td>
</tr>
<tr>
<td>Safety Relay Not Energized</td>
<td>1. Ribbon cable from EStop PCB to backboard PCB is disconnected. 2. Wiring from EStop PCB to Safety Reset button is loose. 3. Safety Relay PCB is not secured to connector on backboard PCB. 4. EStop and/or Safety Relay PCB(s) are damaged.</td>
<td>1. Re-connect ribbon cable from the EStop PCB to the backboard PCB. 2. Tighten the connections between the EStop PCB and the Safety Reset button. 3. Remove the top two nuts on the Safety Relay PCB and remove it. Lower the bottom nuts on and then reinstall the Safety Relay PCB. Reinstall the top nuts and secure them into place.</td>
</tr>
<tr>
<td>LED Interface Lights Not Lighting</td>
<td>1. Ribbon cable(s) from LED PCB to backboard PCB are disconnected. 2. LED PCB is damaged.</td>
<td>1. Re-connect the ribbon cable(s) from the LED PCB to the backboard PCB. 2. Inspect the LED PCB and determine if a replacement is needed.</td>
</tr>
<tr>
<td>Individual Finger or All Fingers Not Responding</td>
<td>1. Fingers are not enabled. 2. Over-current on the fingers’ solenoid valve. 3. Loose wiring for finger(s). 4. Inoperable air cylinder.</td>
<td>1. Set the Soft Touch in SETUP mode and navigate to the FINGER ENABLE screen from the SETUP PARAMETERS menu. Ensure that all required fingers are enabled. 2. Inspect the fuse(s) for the unresponsive finger(s). Determine if replacement(s) are needed. 3. Inspect the wiring for each of the fingers and tighten any loose connections. Remove terminal block cover in the finger enclosure. Inspect the wiring for each of the fingers and tighten any loose connections. 4. In the finger enclosure, inspect the air cylinders for pressure leaks and determine if they can be repaired or if replacements are needed. Consider test forcing or cycling fingers under Maintenance when troubleshooting.</td>
</tr>
<tr>
<td>All Enabled Fingers Not Extending or Retracting after Soft Touch has been Started</td>
<td>1. Divert mode is set to NONE or ALL. 2. Air pressure is too low. 3. Jam reaction has occurred and the designated finger reaction is set to UP or DOWN.</td>
<td>1. Set the Soft Touch in SETUP mode and navigate to the FINGER ENABLE screen from the SETUP PARAMETERS menu. Ensure that all required fingers are enabled. 2. Navigate the RUN MONITOR screen and inspect the air pressure reading. Inspect the air flow regulator and ensure the shutoff is not in place. Determine if air supply is depleted. 3. Inspect conveyor line and clear jam. Press ACK/CLEAR on fault message popup window on HMI to clear jam fault. Press START to restart the Soft Touch.</td>
</tr>
</tbody>
</table>

**Table 4-1: Troubleshooting**

*Note: Disconnect power when performing electrical maintenance. De-energize air pressure when performing pneumatic maintenance.*
4. TROUBLESHOOTING

4.2 Signal Light Interpretation

The signal light on the Soft Touch gives the operator an indication on the current state, mode, and status of the various functions. Below is a table of all possible colors of the signal light, its configuration parameters, and reason for its current color.

<table>
<thead>
<tr>
<th>Color</th>
<th>Configuration</th>
<th>Meaning / Definition</th>
</tr>
</thead>
</table>
| Red   | 1. State: STOPPED, Mode: ALL  
2. State: EXECUTING, Mode: PRODUCTION  
3. State: HELD, Mode: ALL  
2. Soft Touch is diverting packages.  
3. Soft Touch has detected low air pressure or HOLD button was pressed.  
4. Soft Touch has detected a jam at the inlet or exit. |
| Green | State: EXECUTING  
Mode: PRODUCTION | Soft Touch has been started and is currently passing packages. |
| White | State: STOPPED, IDLE  
Mode: PRODUCTION | Soft Touch is stopped or ready to be started. |
| Yellow | State: EXECUTING  
Mode: PRODUCTION | Soft Touch has been configured to either divert all packages or pass all packages. |
| Violet | State: ALL  
Mode: SETUP | Soft Touch is performing operations in SETUP mode. |
| Blue  | State: STOPPED  
Mode: MAINTENANCE | Soft Touch is in testing operations in MAINTENANCE mode. When testing the signal light under Maintenance, the signal light may be a color other than blue. |
| Off   | State: ALL  
Mode: ALL | Soft Touch PLC has encountered a fault or is in program mode. |

Table 4-2: Signal Light Interpretation
4. TROUBLESHOOTING

4.3 Detected Faults and Fault Messages

Fault numbers 25 through 31 are reserved for future use (*Table 4-3*).

<table>
<thead>
<tr>
<th>Fault</th>
<th>Fault Message</th>
<th>To Clear the Fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>EMERGENCY STOP BUTTON PRESSED / SAFETY RELAY NOT ACTIVE.</td>
<td>Ensure emergency stop button is pulled out and press safety reset button. Next, press ACK/CLEAR on HMI.</td>
</tr>
<tr>
<td>1</td>
<td>LOW AIR PRESSURE.</td>
<td>Ensure air pressure is present throughout the Soft Touch. Next, press ACK/CLEAR on HMI.</td>
</tr>
<tr>
<td>2</td>
<td>SHIFT REGISTER OVERRUN. IF PERSISTS, REDUCE CONVEYOR SPEED.</td>
<td>Press ACK/CLEAR on HMI. Reduce conveyor speed if fault persists.</td>
</tr>
<tr>
<td>3</td>
<td>CLOCK OVERRUN. IF PERSISTS, REDUCE CONVEYOR SPEED.</td>
<td>Press ACK/CLEAR on HMI. Reduce conveyor speed if fault persists.</td>
</tr>
<tr>
<td>4</td>
<td>LOST INTERRUPT EII4 (REJ A).</td>
<td>Press ACK/CLEAR on HMI.</td>
</tr>
<tr>
<td>5</td>
<td>LOST INTERRUPT EII5 (REJ B).</td>
<td>Press ACK/CLEAR on HMI.</td>
</tr>
<tr>
<td>6</td>
<td>LOST INTERRUPT EII6 (REJ C).</td>
<td>Press ACK/CLEAR on HMI.</td>
</tr>
<tr>
<td>7</td>
<td>LOST INTERRUPT EII7 (REJ D).</td>
<td>Press ACK/CLEAR on HMI.</td>
</tr>
<tr>
<td>8</td>
<td>LOST INTERRUPT EII0 (SENSOR 1).</td>
<td>Press ACK/CLEAR on HMI.</td>
</tr>
<tr>
<td>9</td>
<td>LOST INTERRUPT EII1 (SENSOR 2).</td>
<td>Press ACK/CLEAR on HMI.</td>
</tr>
<tr>
<td>10</td>
<td>DISTANCE TRACKING OVERRUN. IF PERSISTS, REDUCE CONVEYOR SPEED.</td>
<td>Press ACK/CLEAR on HMI. Reduce conveyor speed if fault persists.</td>
</tr>
<tr>
<td>11</td>
<td>PRODUCT JAM DETECTED AT INLET.</td>
<td>Inspect inlet area and remove jam. Next, press ACK/CLEAR on HMI.</td>
</tr>
<tr>
<td>12</td>
<td>JAM DETECTED BY INLET SENSOR. SOFT TOUCH OPERATION SUSPENDED.</td>
<td>Inspect inlet area and remove jam. Next, press ACK/CLEAR on HMI. Next, press START on HMI.</td>
</tr>
<tr>
<td>13</td>
<td>PRODUCT JAM DETECTED AT EXIT.</td>
<td>Inspect exit area and remove jam. Next, press ACK/CLEAR on HMI.</td>
</tr>
<tr>
<td>14</td>
<td>JAM DETECTED BY EXIT SENSOR. SOFT TOUCH OPERATION SUSPENDED.</td>
<td>Inspect exit area and remove jam. Next, press ACK/CLEAR on HMI. Next, press START on HMI.</td>
</tr>
<tr>
<td>15</td>
<td>SOFT TOUCH MUST BE STOPPED TO RECALL A JOB FILE.</td>
<td>Press the STOP button on HMI. Next, press ACK/CLEAR on HMI.</td>
</tr>
<tr>
<td>16</td>
<td>ENCODER MAPPING SEQUENCE IN PROGRESS.</td>
<td>Wait for sequence to complete or press sequence button to cancel. Next, press ACK/CLEAR on HMI.</td>
</tr>
<tr>
<td>17</td>
<td>REJECT SIGNAL DISTANCE SEQUENCE IN PROGRESS.</td>
<td>Wait for sequence to complete or press sequence button to cancel. Next, press ACK/CLEAR on HMI.</td>
</tr>
<tr>
<td>18</td>
<td>MAINTENANCE TESTING OPERATION IN PROGRESS.</td>
<td>Navigate to current testing screen to continue operation or press button to disable. Next, press ACK/CLEAR on HMI.</td>
</tr>
<tr>
<td>19</td>
<td>QC SAMPLING IN PROGRESS.</td>
<td>Navigate to QC Sampling screen to continue or press button to disable. Next, press ACK/CLEAR on HMI.</td>
</tr>
<tr>
<td>20</td>
<td>SENSOR CALIBRATION SEQUENCE IN PROGRESS.</td>
<td>Wait for sequence to complete or press sequence button to cancel. Next, press ACK/CLEAR on HMI.</td>
</tr>
<tr>
<td>21</td>
<td>SEQUENCE ABORTED DUE TO EMERGENCY STOP.</td>
<td>Press ACK/CLEAR on HMI.</td>
</tr>
<tr>
<td>22</td>
<td>UNABLE TO PERFORM. OTHER SEQUENCE IN PROGRESS.</td>
<td>Press ACK/CLEAR on HMI.</td>
</tr>
<tr>
<td>23</td>
<td>MUST BE IN SETUP OR PRODUCTION MODE TO RESET AND START SOFT TOUCH.</td>
<td>Change to SETUP or PRODUCTION mode. Next, press ACK/CLEAR on HMI. Next press RESET on HMI.</td>
</tr>
<tr>
<td>24</td>
<td>LOW AIR PRESSURE DETECTED. SOFT TOUCH OPERATION HELD.</td>
<td>Ensure air pressure is present throughout the Soft Touch. Next, press ACK/CLEAR on HMI.</td>
</tr>
</tbody>
</table>

*Table 4-3: Fault List*
4. TROUBLESHOOTING

4.4 Fault Log

When performing troubleshooting and testing operations, there may be instances when it is desired to reference past faults to help in the task at hand. The Soft Touch is capable of recording the ten most recent detected faults during operation in a set of screens titled Fault Log. These screens are accessible by navigating to the Soft Touch Support Help Menu from the Main Menu screen.

New faults are stored in the 1st position and older faults are shifted towards down towards the 10th position. If it required to record fault information as part of routine maintenance checks, it is suggested to manually record the fault information shown on these screens as faults shifted past the 10th log position are lost indefinitely. An example is shown of the fault log interface and direction of shifted fault messages (Figure 4-4, 4-5).

![Figure 4-4: Screen 1 of 2](image)

![Figure 4-5: Screen 2 of 2](image)
5. TECHNICAL ASSISTANCE

5.1 Technical Assistance

For assistance in resolving issues not addressed by this manual, please contact your Silgan Field Service Engineer.

Should your Silgan Field Service Engineer be unavailable, call Silgan Equipment Company Customer Service at 847-336-0552. Your case will be directed to the next available Service Engineer.

For repair and replacement parts, call Silgan Equipment Company Customer Service at 847-336-0552.

For Technical Support, Call: 877.205.3225
www.silganequipment.com/vision/
Waukegan, IL USA