FOXJET
AN ITW COMPANY

Spec.e

Operator's Manual

LS4600e

LS6000e

6000-010F
Revision A

FoxJet, an ITW company, continually improves its products, and reserves the right to change or discontinue specifications and designs shown in this manual without notice and without incurring obligation. FoxJet has made every effort to verify the information contained in this manual, but reserves the right to correct any error at the time of the manual's next revision.

Printed in the United States of America

1.0 Introduction

1.1 The LS4600e and LS6000e Printer - Applicators

The LS4600e and LS6000e are seventh generation, next label out, print and apply labelers designed for modularity, continuous labeling, self-diagnostics, and ease of use. Modularity of design provides the basis for ease of installation, setup, and maintenance. The electronics system employs a hardware-specific design, thus increasing reliability and throughput. The hardware was developed to simplify construction, and increase longevity by using durable materials. This unit will perform 24/7 operation in harsh environments and operate trouble-free, given that the appropriate preventative maintenance is performed on regular service intervals.

1.2 Product Safety

Safety awareness is critical when working with equipment that contains moving parts and extending electric actuators. Please read all warnings and cautions thoroughly before operating this device.

This product meets the requirements of CAN/CSA-22.2 NO.60950-00 * UL 60950 using FoxJet an ITW Company approved items. Units are only tested and qualified with FoxJet an ITW Company approved parts and accessories. Use of other parts or accessories may introduce potential risks that FoxJet an ITW Company can assume no liability for.

WARNINGS

- **WARNING - Moving parts of this machine can present hazards. Components that cannot be guarded because of loss of functionality are marked with a warning symbol.**
- **Be aware of the actuator extension distance, and avoid accidental triggering of the photosensor.**
- **When servicing the unit's electronic assemblies, always remove the power cord from the unit to prevent accidental shock.**
- **When running for extended periods of time, use caution when accessing the drive module circuitry. The motor drive power transistors, motor case, and motor heatsink can become hot under constant use.**
- **Wear personal protective equipment, as instructed by your supervisor, when operating or working near this device.**

COMPLIANCE

- **CAUTION: Not for use in a computer room as defined in the Standard for the Protection of Electronic Computer/ Data Processing Equipment, ANSI/NFPA 75.**
- **ATTENTION: Ne peut être utilissé dans une salle d'ordinateurs telle que définie dans las norme. ANSI/NFPA 75 Standard for the Protection of Electronic Computer/ Data Processing Equipment**
- **This unit has been tested and found to comply with the limits for a Class A device, pursuant to part 15 of the FCC Rules.**

- **This unit has been tested to comply with CE Standards.**
- **This unit is equipped with an Emergency Stop switch. Depressing this switch will cause all machine operations to cease.**
- **This unit was tested and it was determined that a potential for tipping exists in certain orientations. In compliance with UL safety standards, the stand must be secured to the surface where it is located. Additionally, this type of securing will result in greater product application accuracy.**

1.3 Warranty Information

The LS4600e and LS6000e labelers, including all components unless otherwise specified, carry a limited warranty. For all warranty terms and conditions, contact FoxJet, an ITW Company, for a complete copy of the Limited Warranty Statement.

1.4 Specifications

General Specifications

Category	Parameter
Dimensions (with Yoke)	**31 in. (787 mm) L x 27 in. (686 mm) H x 26 in. (660 mm) D**
Weight	**120 lbs (54.4 *kg*) (includes yoke, no stand)**
Accuracy	**±0.06 in. (*±1.6 mm*)**
Certifications	**Œ, CSA, FCC approved, ETL Listed (UL 60950)**
Supply Roll Capacity **LS4600e** **LS6000e**	 **13 in. (*330.2 mm*)** **14 in. (*355.6 mm*)**
Label Length	**0.5 in. (*12.7 mm*) Min. to 14.0 in. (355.6 *mm*) Max.**
Label Width	**0.5 in. (*12.7 mm*) Min. to 4.0 in. (*101.6 mm*) Max.**
Product Rate **LS4600e** **LS6000e**	 **50 PPM Max.** **110 PPM Max.**
Temperature	**41°F - 104°F (5°C - 40°C)**
Humidity	**10 to 85% RH, Non-Condensing**

Electrical Specifications

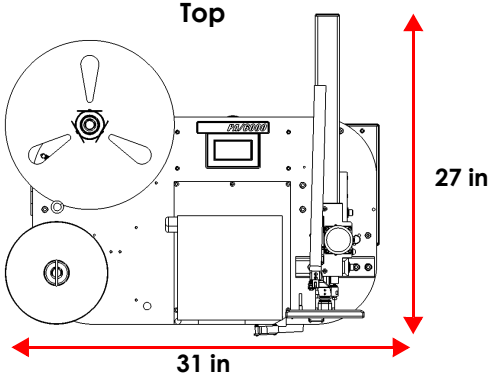
Category	Nominal	Minimum	Maximum
AC Voltage Supply	100 - 240 VAC, 1.6A 50/ 60 Hz	90 VAC 47 Hz	264 VAC 63 Hz
Product Detector	Low: 0 to 3 VDC High: 3 to 5 VDC Supplies 24VDC	0 VDC	24 VDC
Product Detector Pulse Width	10 mS	1 mS	Infinite
Auxiliary Output Warning Tower	0 and 24 VDC 1 Amp sinking	0 VDC 0 mA	24 VDC 1.5 Amps sinking
Discrete Inputs (Optional)	Low: 0 to 10 VDC High: 10 to 24 VDC	0 VDC	26 VDC
Discrete Input Pulse Width Detection	20 mS	3 mS	Infinite
Discrete Outputs (Optional)	0 - 24 V AC/DC at 150 mA	0 V AC/DC, 13 ohms	30 V AC/DC at 170 mA

Performance Specifications - E-Tamp Labeler

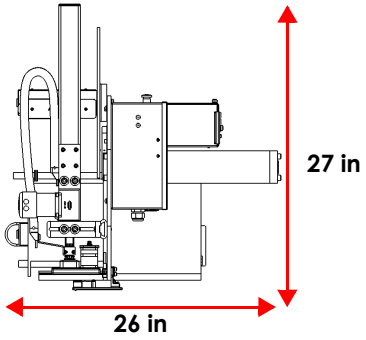
Application	Label Size	Stroke Distance (Baseplate edge to product)	PPM Maximum
Side Orientation (Nose-Down)	4x2, 10 ips	4 inches, "A5" Actuator Profile	82 PPM
Side Orientation (Nose-Down)	4x2, 12 ips	4 inches, "A5" Actuator Profile	85 PPM
Side Orientation (Nose-Down)	4x2, 12 ips	3 inches, "A5" Actuator Profile	94 PPM
Side Orientation (Nose-Down)	4x2, 12 ips	1.5 inches, "A5" Actuator Profile	102 PPM

1.5 System Dimensions

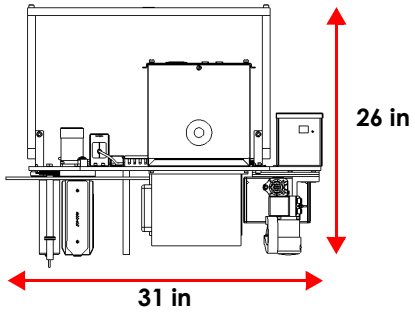
Top



Side

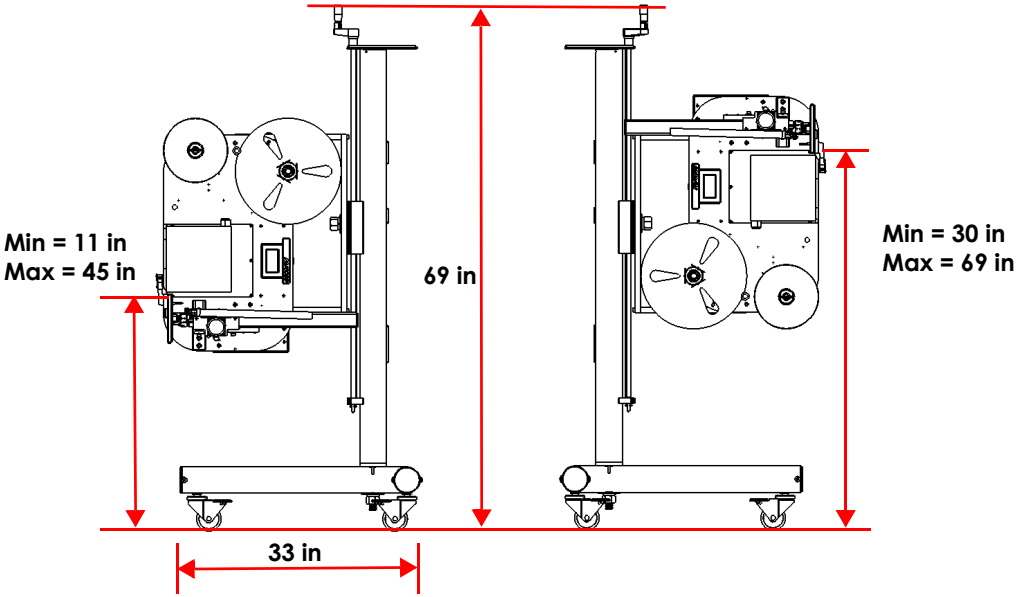


Overhead



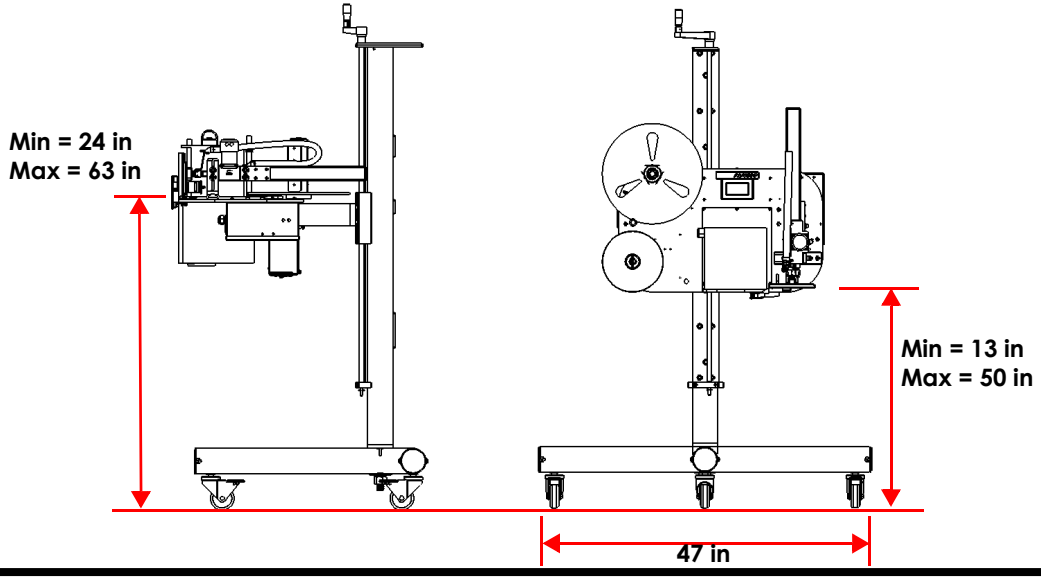
Nose Down

Nose Up



Side Orientation

Top Down



2.0 System Modules

FRONT

Unwind Supply Roll
- Indestructible ABS Material
- 14 in. (355 mm) Disk
- 3 in. (76 mm) ID Core

4600-605

Dancer Arm
- Non-rotating spindle
- Performs label/liner braking

4600-643

Rewind Liner Take-Up
- Indestructible ABS 1-pc Material
- Simple clasp liner keep

4600-606

OEM Industrial Printers
- SATO and Zebra Print Engines
- Can be changed from print and apply to Label Applicator with Drive Module

Air Assist Module

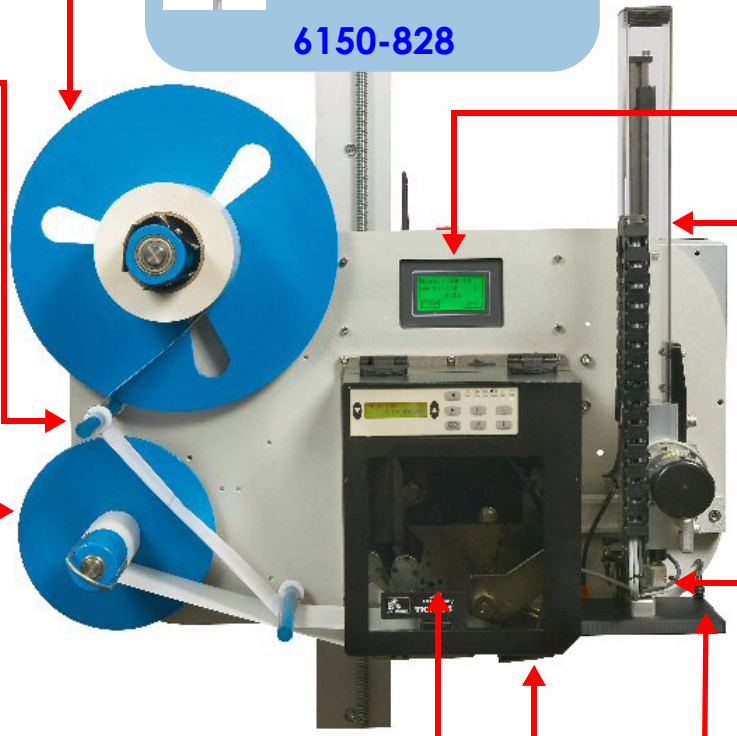
- Blower fan to guide label to Tamp Pad
- BLDC Blower Fan
- Swings out of the way for webbing liner

6000-666 L/R

* Warning Tower

- Red, Yellow, and Green incandescent bulbs
- 24 VDC 5W
- Upgrade to LED Bulbs by adding P/N: 6145-503

6150-828



User Interface

- 128x64 LCD Graphics
- Touch Screen
- Tri-Color
- Remote Tether Option

4600-200

E-Tamp Actuator
- 10 or 20 inch variable stroke lengths
- IGUS Energy chain guarding
- Brushless DC Servo motor
- Articulated pivoting pad knuckle

6000-620 x10 or x20

Product Detector

- Diffused light sensor
- 900 mm range
- Light or Dark Operate
- NPN Signal

4600-900

* Tamp Pad Sensors

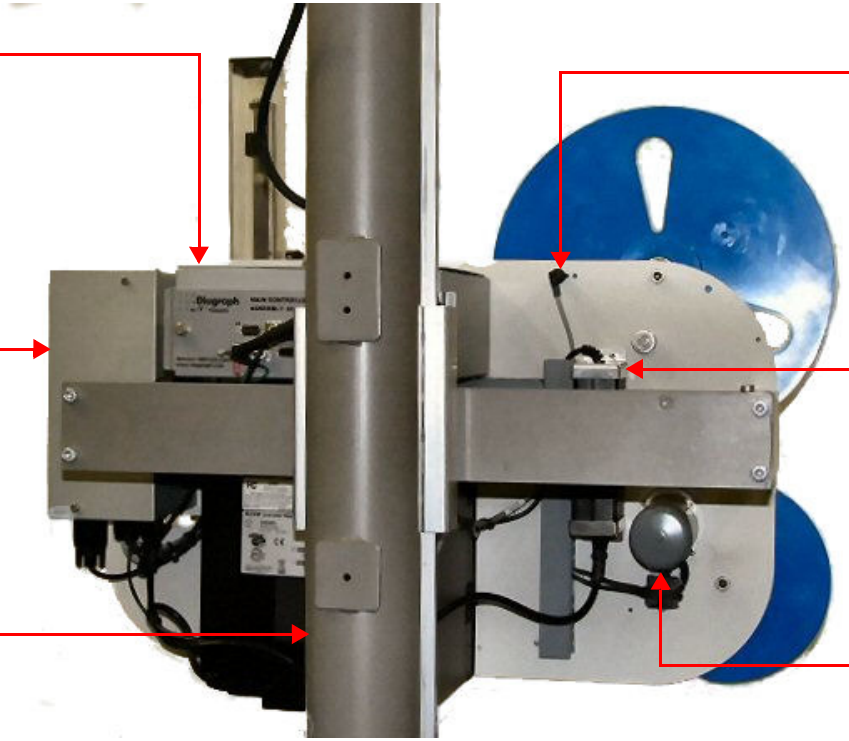
- Label Present sees label
- Auto-Retract sees product
- Focused beam
- Shielded, high flex PUR cabling, M8 Connector

6000-903

*** = Denotes Optional Equipment**

System Modules

REAR



MCA

- Main Controller Assembly
- Contains LCD Display
- Microprocessor-based real-time control
- Replacement CPU 4600-951

4600-500

MCM

- Motor Control Module
- Handles actuator and fan controls
- Has internal power supply for high-speed movements

6000-550

* Tube Stand

- T-Base stand w/casters
- High Tensile Strength Steel
- Aluminum travel plate
- Mounting locations for options, such as remote user interface

6160-329

* Stand Cleats

- Allows labeler to easily be removed and replaced at the line by locating the casters in position
- Prevents any accidental tipping of the labeler stand

4600-622

* Label Low Sensor

- Signals warning when supply roll is reaching the end
- Adjustable positions for triggering sooner or later into the roll

6000-903

Power Supply

- AutoRanging Voltage
- Protected against surges, spikes, and transients
- Low voltage to electrical enclosure for greater safety

4600-522

Rewind Motor

- Brushless DC Motor
- No clutch rewind eliminates adjustments and wear items
- Keeps up with the fastest print speeds

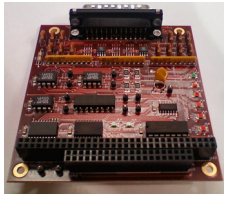
4600-503

*** = Denotes Optional Equipment**

System Modules

3.0 Optional Equipment

6000-420 	Wired/Wireless Ethernet Module Provides wired Ethernet connectivity with 10/100BaseT and wireless 802.11g capability on the same module. Label formats, status information, and printer functions can be performed by Ethernet with this option.
4600-903 	Auto Retract, Label Present, and Label Low Sensors The Auto Retract sensor detects the product's surface before contact to allow light touch or varying size (height or width) applications. The Label Present sensor detects the label on the pad to stop the labeler from applying the wrong label to a sequenced product. It will generate another label if one is removed from the pad prior to application, and stops the generation of another label if one is already on the pad. The Label Low sensor is used to signal the operator that the consumable label roll is low and will require replacement soon.
4600-250 	Remote Tethered Handheld Provides 5 feet (1.5 m.) of distance away from the labeler for operation. Ergonomically designed to fit in the user's hand, this rugged unit can be mounted on the back of the stand or elsewhere to allow easy access. This unit takes the place of the baseplate mounted display.

6145-405 	Discrete I/O Module This module provides four (4) optically-isolated inputs and six (6) isolated solid-state outputs. These I/O lines are event driven by selections made by the operator through the user interface. The connection can be made directly to a DB25 connector or the Phoenix breakout screw terminal connector that mates to the DB25.
4600-901 4600-902 	Product Detectors - Break-Beam & Laser The standard diffuse light sensor works well for standard corrugate, but for shrink wrapped pallets the 4600-901 Break-Beam sensor is a better choice. For small products, or better accuracy the 4600-902 Laser sensor is ideal. All sensors have a quick disconnect M8 connector, shielded cable, and can be mounted on the baseplate or on-line with included brackets.
6000-828 6000-828AUD 	Warning Tower The three (3) segment warning tower visually displays Online-Running in green, Warning-Offline in yellow, and Error-Offline in red. The tower comes with incandescent bulbs and can be upgraded to LED bulbs with the 6145-503 kit. The tower is offered with an audible alarm siren for the error condition with the 6000-828AUD part number.

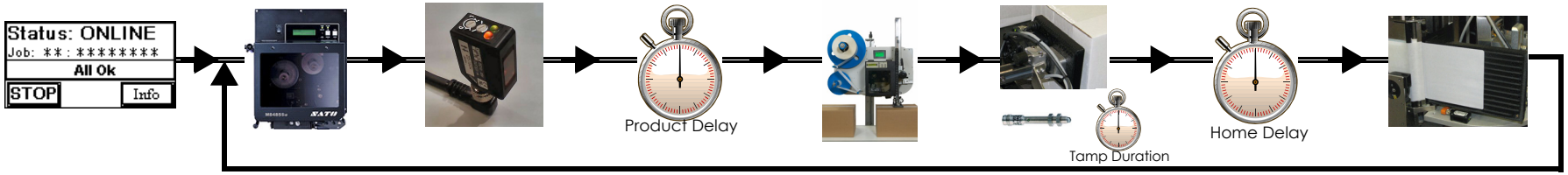
4.0 Theory of Operation

There are two basic modes of operation, Next Label Out and Print on Demand. The right mode is dependent on the application.

Next Label Out

Pro's: Maximum Throughput
Label Print and Tamp Time Drives PPM

Con's: Batch Change Could Leave Mismatched Label On Pad
Slow Product Rates Leave Label Adhesive Exposed Longer

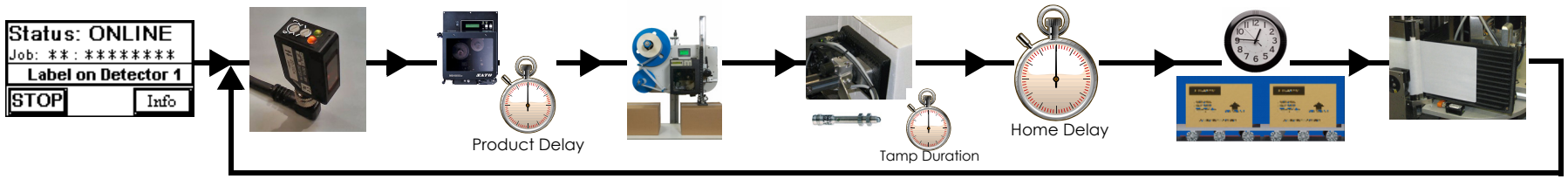


Labeler is placed online	The printer immediately prints the label if a format is loaded	The Product Detector triggers upon detecting the product	The Product Delay timer counts down to expiration	The Tamp Actuator is extended to the product to apply the label	The Tamp Actuator returns home when the first of these occurs: - Tamp Duration Expires - Auto-Retract triggers and delay expires - Hit Sense detects contact	Home Delay timer counts down to expiration	Label Present sensor checked for label. If no label is present, next label is fed out and cycle repeats

Print on Demand

Pro's: Label Adhesive is Exposed Shorter
Vacuum Fan Runs Less Often

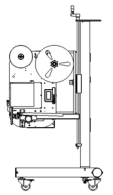
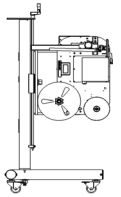
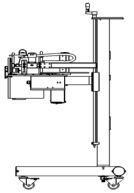
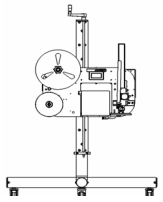
Con's: PPM Rate Determined by Product Length and Print Time
Requires Relocating Product Detector or 2nd Detector



Labeler is placed online. The labeler is now waiting for either Detector 1 or Detector 2 (depending on Label Activation setting in Job Setting Menu).	The Product Detector triggers upon detecting the product	The printer begins feeding the label and the Product Delay timer counts down to expiration	If the label is on the pad and ready to be applied, the Tamp Actuator is extended to the product to apply the label. If not, there will be a "Timing Violation". The Product Delay must be increased or print time decreased.	The Tamp Actuator returns home when the first of these occurs: - Tamp Duration Expires - Auto-Retract triggers and delay expires - Hit Sense detects contact	Home Delay timer counts down to expiration	The next label cannot be generated until the product has cleared the Product Detector	Label Present sensor checked for label. If a label is still present, an error can be set. The labeler will not generate a new label on the next Product Trigger, but will apply the label

5.0 Setup

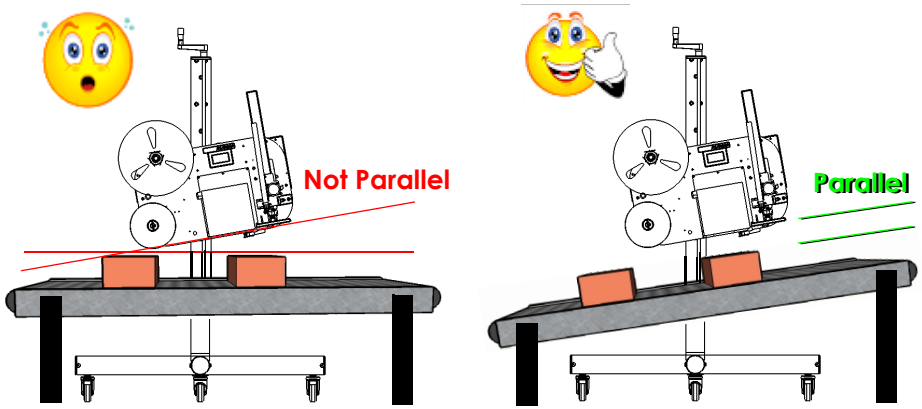
STEP 1 Determine Labeler Orientation

Orientation			View
Nose-Down Apply	• Side panel of product is to be labeled • Placing label close to top edge of product • Conveyor is low to ground, thus keeping unwind/rewind change out within reach	• Not for applying label toward lower edge of product • Not for tall conveyors where roll change out would be difficult	
Nose-Up Apply	• Side panel of product is to be labeled • Placing label close to bottom edge of product • Conveyor is standard height, thus keeping unwind/rewind change out within reach	• Not for applying label toward upper edge of product • Not for lower height conveyors • Not for label lengths greater than 6 inches (153 mm.)	
Side Orientation	• Side panel of product is to be labeled • Corner wrapped panels • Label is to be applied in landscape orientation	• Not for tall conveyors where roll change out would be difficult	
Top-Down / Bottom-Up Apply	• Top or Bottom panel of product is to be labeled	• More material handing is required for Bottom-Up applications	

STEP 2 Labeler Alignment with Product

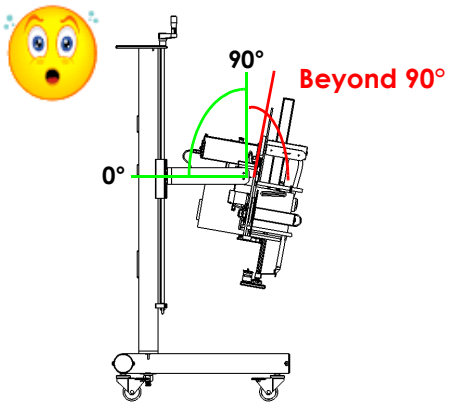
Optimum Labeling Head Positioning

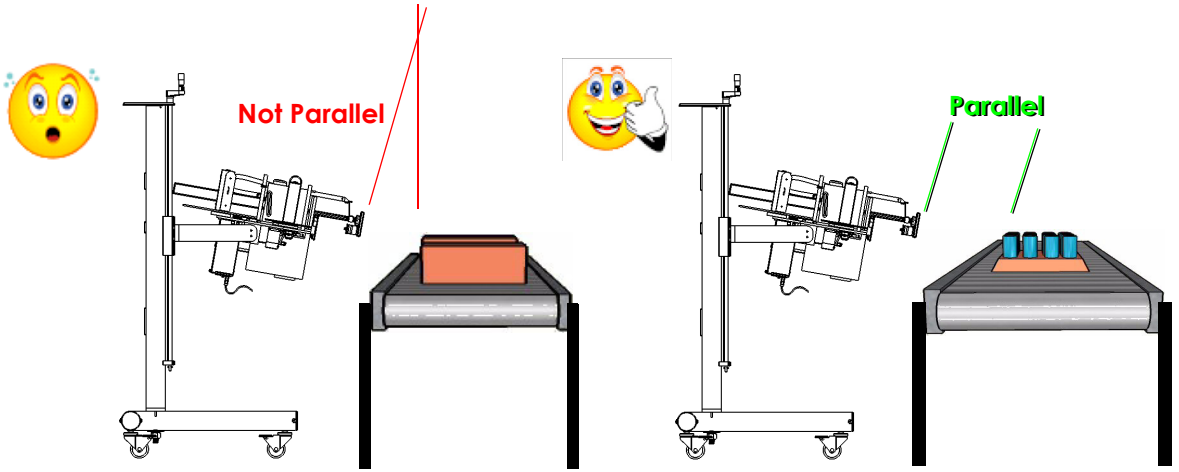
The labeler should be adjusted for position to the product through the yoke, which rotates about two axes. The labeler must be rotated on these axes to obtain a parallel surface contact when the tamp pad meets the product's surface. The systems are equipped with an articulated knuckle to accommodate some product skew and variances. The setup should not depend on this small amount of pivoting to avoid the proper alignment of the yoke.



Label Supply Roll Positioning

The labeler will not work properly if the label supply angle is beyond 90 degrees, with respect to the ground. This will allow the label roll to slip off of the labeler and can cause liner tracking problems within the printer.

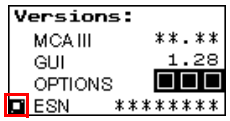




STEP 3 Configure Basic Settings

One Time Settings (OTS)

These screens can only be accessed when powering-up or coming out of Standby. The lower-left square must be pressed when the *Versions Screen* is momentarily displayed. These values should be preset from the factory, and should not require change.

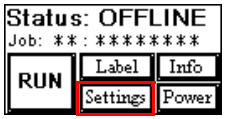


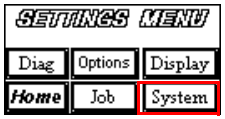
Press square to access OTS

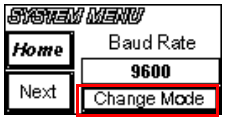
Communications Settings

All communication to the printer is directed through the MCA (Main Controller Assembly). When the Wired/Wireless Ethernet Module (6000-420) is used, the correct baud rate must still be selected. The baud rate set in the *System Menu* should match the printer's baud rate, and if this is an RS232 connection, the PC/PLC baud must match as well. Access the System Menu by pressing **Settings** on the *Home Screen*. From the *Settings Menu*, press the **System** button to access the *Baud Rate Screen*

.



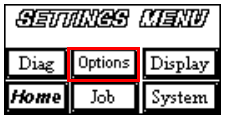


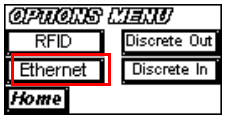


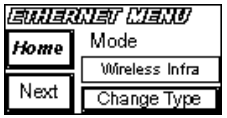
Baud choices are 9600, 19200, 38400, 57600, and 115.2k
The standard values are:
Number of bits: 8
Parity: None
Stop bits: 1

If the Ethernet module has been installed, press the **Options** button from the *Settings Menu*. Press the **Ethernet** button to enter the *Ethernet Menus*. Enter parameters for Ethernet Mode, IP Address, Netmask, Gateway Address, and SSID (if one of the wireless modes is selected)

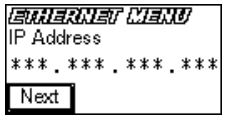
.



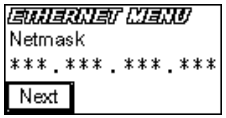




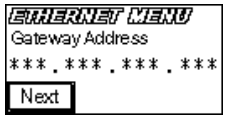
* Serial Com must be selected if Ethernet is not to be used



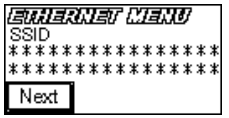
Required for all Ethernet Modes



Required for all Ethernet Modes



Not required for Ad-Hoc



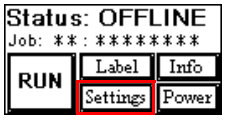
Wireless Only
Enter with spaces to Left-Justify

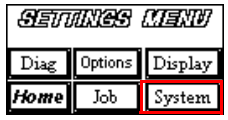
After the selections have been made, commit the changes when the **Home** button is pressed. Select **Yes** when the change settings prompt is displayed. If Wireless network encryption is to be utilized, it must be done through the HTTP interface to the module. The detailed instructions are located in the Ethernet Module Manual.

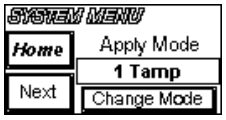
System Menu Settings

The Application Mode, Passcode, Baud Rate, and Auto-Trigger screens are located in the System Menu. The Baud Rate should already be set. The Auto-Trigger screen is only visible if the system was powered-up in a diagnostic mode. Auto-Trigger is used to continuously cycle the actuator without a product detector

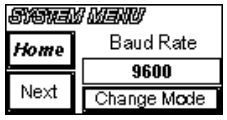
.

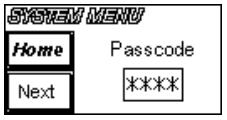




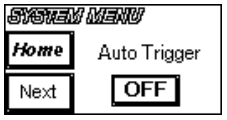


Select the mode that matches the application





A setting of '0000' disables the passcode

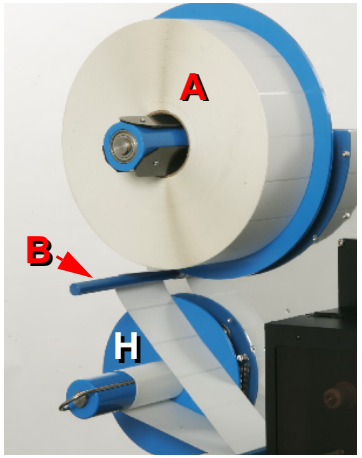


Conditionally shown
Should be Off for normal operation

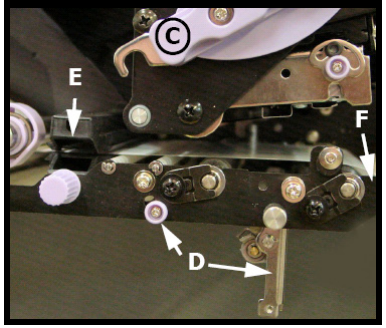
STEP 4 Load the Media

LABEL SUPPLY CHANGEOUT

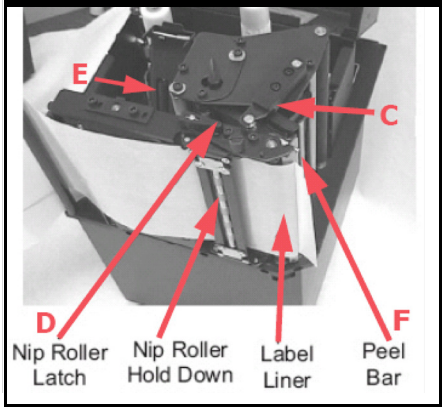
Begin by removing the last supply roll core and remaining label liner from the labeler. Insert the new roll over the unwind fins and press roll firmly against the unwind disk (A). Remove 2 feet of labels from the liner to create a leader. Route the liner around the dancer arm (B) and feed into the printer. Unlatch the printhead (C) and nip roller arm lever (D). Feed the liner through the gap sensor (E), under the printhead, and around the peel blade (F). ***Be sure to avoid webbing over the air assist blower***. Once around the peel blade, feed liner through the nip roller arm and close printhead latch and nip roller arm. Take the liner to the rewind (H), and use the clasp to retain it. With the printer offline, press the feed button to register the first label; before the printer is returned online and the labeler begins running. The label change out can be accomplished in less than a minute by an experienced user.



SATO Lt408 (4600)



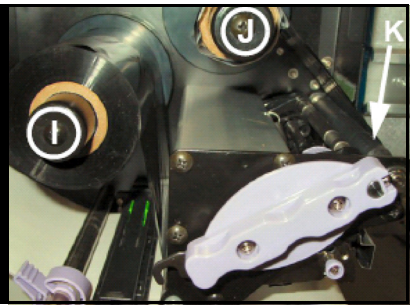
SATO M84xxSe (6000)



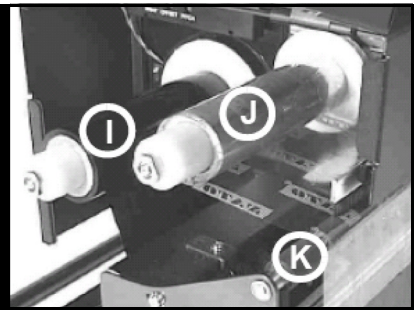
RIBBON MATERIAL CHANGEOUT

Remove the last ribbon take-up roll from spindle (J), and move the old supply-side core from spindle (I), and place it on spindle (J). Insert the new ribbon, observing the ribbon type (face-in or face-out) on the supply-side spindle (I). Route the ribbon under the printhead support arm, around the ribbon roller (K), and wrap around the take-up spindle (J). Make a few wraps and close the printhead latch. Try a few test feeds before going back online.

SATO Lt408



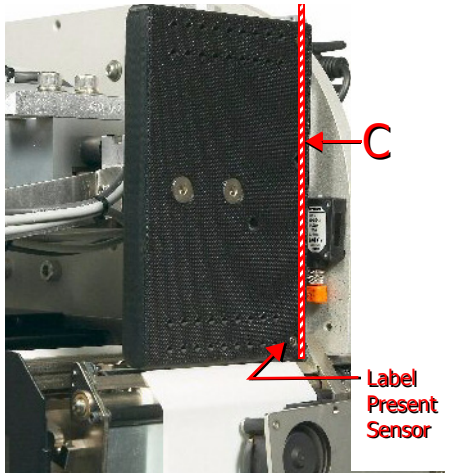
SATO M84xxSe



STEP 5 Alignment of the Tamp Assembly

Tools Required:

- 6 mm. Allen Wrench
- 7 mm. Open End Wrench



Lineal (X) Position Adjustment

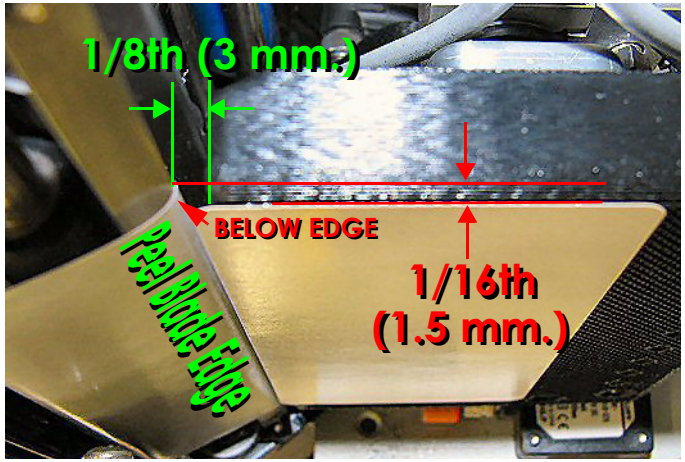
- Loosen the two 6 mm. screws (A) on the dovetail slider
- Slide assembly in and out from the printer until there is approximately 1/8th inch (3 mm.) of space between printer peel blade and tamp pad edge
- Tighten the two 6 mm. screws (A) on the dovetail slider

Lateral (Y) Position Adjustment

- Loosen the two 6 mm. screws (B) on the tamp actuator L-bracket
- Slide the assembly in and out from the baseplate until the label present sensor is within the feed position of the label. Line (C) shows the projected path of the label where the label present sensor would be fully covered once the label is printed
- Tighten the two 6 mm. screws (B) on the tamp actuator L-bracket. Keep the actuator parallel to the baseplate during tightening

Height (Z) Position Adjustment

- Loosen the 7 mm. square head jam screw on the actuator rod end located by the tamp pad
- Turn the rubber bumper by hand to adjust the tamp pad height position. Turn clockwise to decrease height, counter-clockwise to extend height
- The optimum position will be an 1/16th inch (1.5 mm.) below the peel blade. This is important in order to stop the label from backfeeding into the printer and prevent label rotation upon actuator extension
- With the E-Tamp controller on, check the resting position of the pad. Once the proper position is set, tighten the square-headed jam screw to lock the bumper in position. ***Failure to re-tighten the jam screw will cause feed errors over time as the bumper becomes loose.***



STEP 6 Configure the E-Tamp Module

Overview

The Electric Tamp Module is comprised of these subsystems:

- Linear belt-driven actuator rod with motor housing, bearings, and end travel stop
- Brushless DC Servo motor (same as used on Applicator Rewind)
- Counter-rotating turbo vacuum fan and tamp pad
- Motor Controller Electronics Assembly
- Air Assist Blower Fan Assembly

As the label is feeding out of the printer, the air assist blower and vacuum fan are activated to draw the label to the pad and hold it in place for application. When the MCA sends the tamp signal, the actuator is extended to the product. The actuator is returned when the MCA ends the tamp signal or upon product contact, if the Hit Contact mode is enabled. When there is no label detected on the pad for over 5 seconds, the vacuum fan reduces speed to an idle. The blower fan is always active.

Actuator Speed Profile Setting [Ax]

There are five actuator speed settings to match the application requirement. See following chart for recommended setting

Ax Profile	Application
A1	Pallets, PPM less than 40
A2	Pallets, PPM 20 to 60
A3	Pallets, PPM 20 to 60
A4	PPM greater than 60
A5	PPM greater than 80

Vacuum Fan Profile Setting [Fx]

There are five vacuum fan profile settings to match the application label size. See following chart for recommended setting

Fx Profile	Label
F1	Label length > 8 inches
F2	Label length > 8 inches
F3	Label size closely matches pad size (i.e.- 4x6 label on 4x6 pad)
F4	Label area is smaller than pad size by 50% (i.e.- 4x2 label on 4x4 pad)
F5	Label area is smaller than pad area by 70% (may require custom pad to accommodate)

Hit Contact Mode Setting [Hx]

There are two modes of operation for hit contact mode. A value of '1' enables the mode and a '0' disables the mode.

To change profiles in the E-Tamp Module

Press SET button for 1 second for Actuator Speed

Once the profile number is flashing, press the SET button momentarily to advance through the profile settings. When the desired value appears, wait for the display to stop flashing to set the value. Re-adjust the Tamp Duration after making speed changes to avoid stroking actuator to the maximum position.

Press SET button for 2 seconds for Vacuum Fan Speed

Once the profile number is flashing, press the SET button momentarily to advance through the profile settings. When the desired value appears, wait for the display to stop flashing to set the value.

Press SET button for 3 seconds for Contact Hit Sense

Once the mode number is flashing, press the SET button momentarily to advance through the profile settings. When the desired value appears, wait for the display to stop flashing to set the value.

Press SET button momentarily to view settings

STEP 7 Product Detector

Product Detector for the Application

The standard product detector offered is the Diffuse Light 4600-900 sensor. There are two optional sensor types, one is a break-beam sensor, and the other is a laser with background suppression. The proper product detector can make the difference in label placement and operation.

Product Detector Selector			
Application Detail	Diffuse Light (4600-900)	Break-Beam (4600-901)	Laser (4600-902)
Corrugated brown case, no pre-print	✓	✓	✓
Corrugated brown case, pre-print	×	✓	✓
Tray packs with product gaps in pack	×	✓	✓
Pallets	✓	✓	×
Shrink wrapped products	×	✓	✓
Primary product	✓	✓	✓
Primary product, high speed, high accuracy	×	×	✓

Product Detector Mounting Location

The product detector is mounted on the baseplate from the factory. This location ensures that any movement of the equipment with not effect the Product Delay. There are application set ups where this location will not work, and there are brackets included for remotely mounting the product detector elsewhere. Listed below are the applications that will require the detector to be relocated:

- Using Demand Mode for print (Label Activation is set to Prod Sens 1 or Prod Sens 2)
- High line speeds (greater than 75 FPM) and desired label placement close to the front edge of the product
- Triggering off of the trailing edge for the product

Product Detector Adjustments

All three of the sensors have the same controls for adjustment. Setting S2 (as shown to the right) controls the sensitivity of the detector. With a sample target product in front of the sensor, adjust this setting. The output LED, L2 in the image, will illuminate with the sensitivity adjustment is correct. The power LED, L1 in the image, will show the signal return strength when the output LED is on. Make sure the sensitivity is set so the green LED is on solid so that slightly less reflective products will still cause a trigger. Once the product is removed from the field of view of the sensor, the green LED will return to indicating power, and will be strongly illuminated.

For break-beam applications using the 4600-902 sensor, the Light/Dark setting S1 should be changed. This inverts the output signal mode to the applicator. Since a break-beam application will normally have an active output for no product detected, the change of S1 will allow the triggering to react to the presence of the product.

Sensor Notes

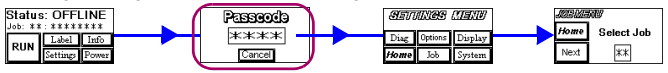
The break-beam sensor has a polarized retro-reflective lens. This means that it requires a suitable reflector that can provide the correct light phase shift to satisfy the sensor. This prevents reflective products (shrink-wrap, glass, etc.) from falsely triggering the sensor.

The laser sensor incorporates a triangulation method to receive the reflected beam. Using this method, the sensor detects true distance rather than product reflectivity. The setting made on S1 will determine distance to the target product. If products will range in distance, the furthest distance product should be used for adjustment. Ensure that objects beyond the target product range are not detected to avoid false triggers.

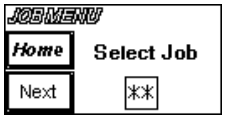
STEP 8 Configure Application Settings

Entering the Job Setting Menus

The machine must be offline in order to access the Job Settings menus. If the labeler is using the passcode protection, the correct value must be entered to proceed to making changes to the Job Settings.

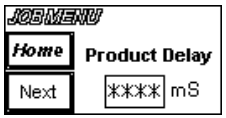


Job Number



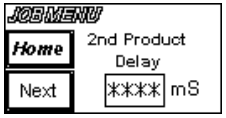
The labeler has a total of 60 jobs that can be recalled. When changes are made to any of the following job settings, they are automatically stored under the current job number. When the Select Job value is changed, all of the parameters are recalled and loaded as the current settings.

Product Delay



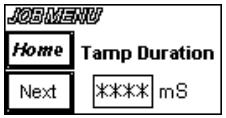
This time value is the delay between product detector trigger and application start. This delay can be calculated by taking (5000 / linespeed in FPM) * the distance from the product detector to peel blade edge in inches). This will yield the delay in milliseconds to be entered on the screen. Some adjustment of this value will be required to position the label on the product at the desired location on the product.

2nd Product Delay



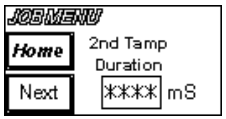
Only displayed if the system Apply Mode is set to 2 Tamps. Calculated the same as above, but include extra time to allow the second label to print and be ready for the second application. If the second label is not ready in time, a **Timing Violation** warning will be given. Increase the delay to avoid this warning.

Tamp Duration



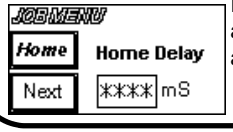
This setting controls the extension stroke time. If the auto-retract sensor is not used, this is the only setting that controls the retract of the tamp actuator. Make sure the tamp duration does not allow the actuator to stroke to the maximum extension position.

2nd Tamp Duration



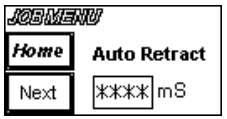
Only displayed if the system Apply Mode is set to 2 Tamps. This controls the second application extension time.

Home Delay



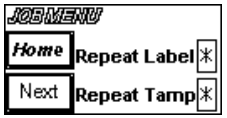
In this screen, a waiting period between the actuator returning home and the next label printed can be adjusted. This delay can be useful for allowing the tamp pad to settle, before the next label is printed.

Auto-Retract Delay



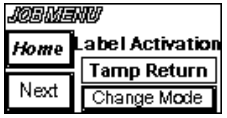
If the optional auto-retract sensor is installed (OTS screens), this screen will be visible for adjustments. The auto-retract sensor will detect the product surface before contact. This allows the lightest touch of the label to the product, which can accomplish nearly the same effect as a tamp/blow on many products and have the benefit of positive contact to ensure label transfer onto the product surface. Since the speed of the actuator can vary, based on the actuator speed, the auto-retract employs an adjustable delay. This delay is started when the sensor first “sees” the product, and allows additional time to contact the product. If the delay is set too short, the tamp pad may never hit the product. If set too long, it will hit the product too hard. If it is set to zero, the auto-retract will be disabled, and the labeler will only use the tamp duration timer to cause retract.

Repeat Tamp/Label



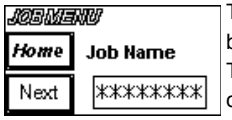
If the optional Label Present sensor is installed (OTS screens) this screen will be visible. The Repeat screen allows a safe guard to be set to prevent multiple labels to be fed for a single tamp, and/or prevent multiple application attempts of the same label. The repeat print function can set a limit to the number of labels fed to the tamp pad for a single application cycle. Likewise, the repeat tamp function can prevent applying the wrong label to the next product. In applications where each label contains unique information for the product this setting can stop the system from continuing if the label returns with the tamp pad after an application cycle.

Label Activation



In this screen, the trigger for printing the next label is selected. For batch applications requiring the fastest throughput, the choice of Tamp Return works best. This will generate a label each time the tamp pad returns home. A choice of Product Sensor 1 allows print to follow the trigger of the product sensor. This requires the product detector to be placed far enough away from the labeler to allow for the label printing to finish in time for application. This works well for applications where each label is unique. A final choice of Product Sensor 2 allows printing to start on a separate trigger than the application delay sensor. Again, this is good for unique label format or varying information, with the added benefit of better control of timing, and label placement.

Job Name



To make recognition of the current job easier, an 8 character name can be assigned to the job. This is accomplished via the Job Name screen. The name can be a combination of numbers, letters, and some special characters.

STEP 9 Configure Discrete I/O Settings (optional)

Entering the Discrete I/O Menus

The labeler must be offline in order to access the Discrete I/O menus. If the labeler is using the passcode protection, the correct value must be entered to proceed to making changes to the Discrete In and Out Menus. Select Settings>Options and either Discrete In or Out to assign events.

Discrete Outputs Electrical Characteristics

There are six (6) solid state isolated outputs that are each capable of switching up to 170mA of current with a maximum voltage of 24 Volts AC or DC. Since these outputs are “closing contacts” in nature, they require a power source on one lead of the contact to flow current to the circuit it is connected to. The Discrete I/O module provides a fused 24 VDC source, limited to 0.5 Amps for this purpose. It is preferred that the installer uses an external source for power, since the sourced power is subject to coupling noise and/or static into the labeler.

Discrete Output Events

Of the six (6) output signal lines, any of them can be configured for any of the predefined system events. Some of the outputs are momentary in signal duration, while others exert the output for the entire length of the event.

Output Event	Description	Output
None	No output event selected	None
Media Out	Label and/or Ribbon supply is exhausted	Steady
Media Low	Label and/or Ribbon supply is low	Steady
Online	Unit is online (ready to print and apply)	Steady
No Format	There is no format in the printer to print	Steady
Error	Unit is offline, due to error. This includes: Media Out, Air Pressure Out, Printer Errors, Repeat Print or Tamp Threshold Exceeded, etc.	Steady
Warning	Unit has experienced a condition that requires attention, but it is still able to run online.	Steady or intermittent, depending on event
Cycle Complete	The apply cycle is finished	Momentary, 20 mS
Cycle Start	The apply cycle is beginning	Dependent on extension stroke time
Label Present	The label is on the tamp	Dependent on the time label is on the pad
Label Reject	The system is requesting the label on the pad to be rejected	Dependent on system reject time
RFID/Scan Good	The system has determined the barcode scan or RFID tag encode was successful	Momentary, 20 mS
RFID/Scan Bad	The system has determined the barcode scan or RFID tag encode was unsuccessful	Momentary, 20 mS
RFID Verify	The system has verified the tag was encoded properly, on product	Momentary, 20 mS
RFID No Verify	The system could not verify the tag on product	Momentary, 20 mS

Discrete Input Electrical Characteristics

There are four (4) optically-isolated inputs that are activated by supplying them a voltage source between 5 to 24 VDC with 25 mA minimum current. Each input has two differential lines that require a source of current to flow to activate an input event. The Discrete I/O Module’s built-in 24 VDC source is a good choice for powering an input, utilizing an external relay or solid state output from the connecting device to open and close the contact and control the event input.

Discrete Input Events

Of the four (4) input signal lines, any of them can be configured for any of the predefined system events. Multiple inputs can be configured to the same event for various application reasons. For example, if there is an application where a bad scan signal from a barcode scanner can stop the system and there is an E-Stop chain that does the same, Input A can be assigned to “Error” for the scanner and Input B can be assign to “Error” for the E-Stop. Now, either conditions can stop the labeler without interfering with each other.

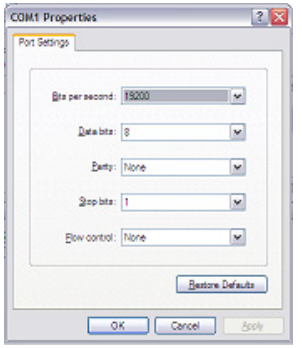
Input events should remain energized for a minimum of 20 mS.

Input Event	Description
None	No input event assigned
Online	Enter online mode. Level activated. Cannot enter online mode if there is an error. Deactivate signal for offline mode
Product Detector 1	Trigger product detector 1 signal. This can start the print cycle (if print activation is set for Prod Sens 1), and start the apply cycle. Pulse activated.
Product Detector 2	Trigger product detector 2 signal. This can start the print cycle (if print activation is set for Prod Sens 2). Pulse activated.
Error	This input allows an external device to halt operation, resulting in an error. Pulse activated.

STEP 10 Create the Label Format

Printer Configuration

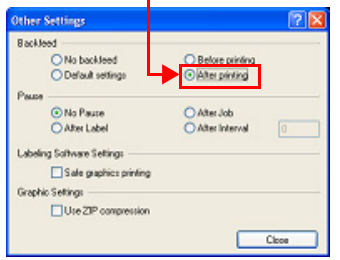
Although label software programs will differ in look and functionality, there are some key similarities. Most importantly, the correct driver for the printer should be selected. For the Sato Lt 408 print engine, the 8485Se driver will work, if there are existing formats created for this model. Formats created for tabletop printers will require some changes for correct operation on a printer-applicator system. Some of these changes include: applicator mode, backfeed distance, offsets in print, and a few others.
Shown below are typical screenshots from NiceLabel, which is the premiere software package that FoxJet offers.



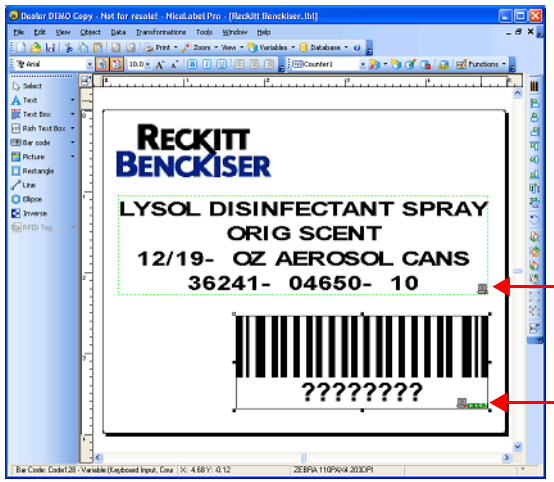
Select the baud rate, and other communication-specific parameters. This is typically found under the Windows>Printers> select *specific printer* >Properties>Ports> select *port number* >Configure Port
In the program's printer setup screens, check to make sure:

- Cutter is not selected
- **Backfeed after Print** (required for this applicator)
- Continuous Print is not selected
- Speed is set to a rate optimal for both print quality and throughput requirements
- Label size entered matches the actual label dimensions
- Darkness is set for good quality print and long life operation

Must be set to Backfeed After



Create your format with text, barcodes, graphics, and other required fields. Try to use printer resident fonts and functionality (such as time, date, and counters), which will greatly reduce download time. Once created, send the format with the desired quantity and adjust positioning as required.

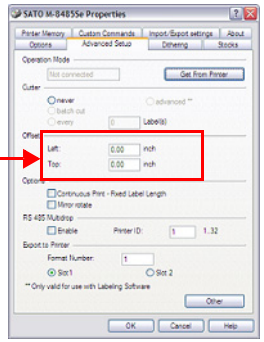


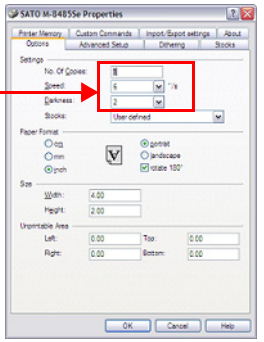
Icon indicates that this is a printer-resident font, which will load faster

Icons show that this is a printer-resident barcode and internal printer counter

Main print attributes

Offset adjusts image position on the label





STEP 11 Runtime Adjustments

Observed	Reason	How to Correct
Label is not feeding out far enough or it is feeding too far	• Label pitch (SATO) position requires adjustment • Tear Off (Zebra) position requires adjustment	• On SATO, the pitch adjustment controls the amount of label overfed on each print cycle. There is a potentiometer adjustment on the front of the printer. • On Zebra, use the printer's menu to find the selection for Tear Off. Adjust this to a higher value for more label overfed or less to keep the next label from "tonguing" out and disturbing the label on the pad
Label is drawn back into the printer	• Not enough label presentation • Tamp pad height incorrect • Vacuum Fan Speed too low	• See correction above • Adjust height of pad to be slightly below the edge of the peel blade. This forces the label to "snap" off of the edge of the tamp pad and avoids the label from relaxing back onto the peel blade • Increase the Vacuum Fan speed to a higher setting. Verify that the pad doesn't just require cleaning
Label is not getting out to the pad or is falling off	• Air Assist Blower is rotated out of the way • Air Assist Blower is damaged • Vacuum Fan Speed too low • Vacuum Fan is damaged	• Rotate the Air Assist Blower under the printer and aim at the tamp pad • Using a flashlight, check that the blower fan is rotating • Try increasing the fan speed to the next higher setting. Make sure that the label is aligned well with the pad • Using a flashlight, check that both fan blades are rotating. Use the lowest setting to see if there is a stationary blade
Double label feed regularly or every so often	• Backfeed mode is not set to Backfeed After • Rewind Profile is set too high • Label Present sensor adjustment required	• This should be set in the label format and/or locally at the printer • This can be adjusted on the One Time Setup screens when the labeler is first powered on or coming out of standby. Select a lower profile • The label present sensor (if installed) could be mounted either too far back from the surface of the tamp pad or too close to (or beyond) the edge of the face surface. Loosen the 7 mm jam nut, remove the M8 quick disconnect cable, and screw the sensor in/out to find the optimal position.

STEP 12 Recall Label Formats from USB Drive (optional)

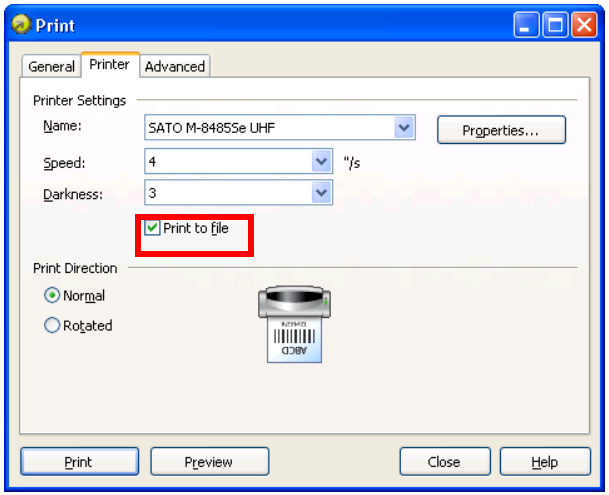
USB Overview

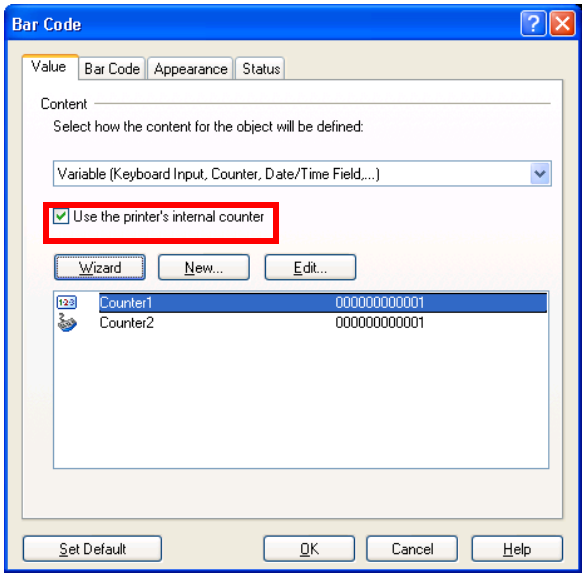
The USB memory storage option allows the recall of a static (non-changing) label format through the user interface or remotely through the Ethernet port. The maximum number of formats that can be stored is 9999, and the size of the format is only limited by the size of the USB memory device. Once the format is selected, it is sent to the printer with the information and quantity defined when the format was created. Internal printer functions for time, date, and sequential counts can be used to create “born-on” or “sell by/best buy” information, provided the label software uses the built-in printer capabilities.

Loading Formats onto the USB Drive

The format loaded onto the USB Drive will depend on which brand of printer is utilized in the labeler. For SATO, the saved file should be an ASCII text file in SATO Programming Language (SPL) and ZPL for Zebra. The format stored on the drive should not be the label file saved from the label program. The format should be an exported or “print to file” version of the format, which would be the output from the label software to the printer. Save the ASCII export file with a filename of 8 characters or less, since the display will only show this many characters in the prompt.

For variable fields, such as date, time, or sequence count, the format will need to use printer-specific commands to utilize internal functions. In many label software programs, there is a choice in the properties menu for the particular field to utilize internal printer functions. This will require the use of printer-resident fonts and barcodes. Once the formats are loaded on the drive, it can be inserted into the back of the MCA in the USB slot (make sure the labeler is not accessing the format menus when removing/inserting the USB drive).





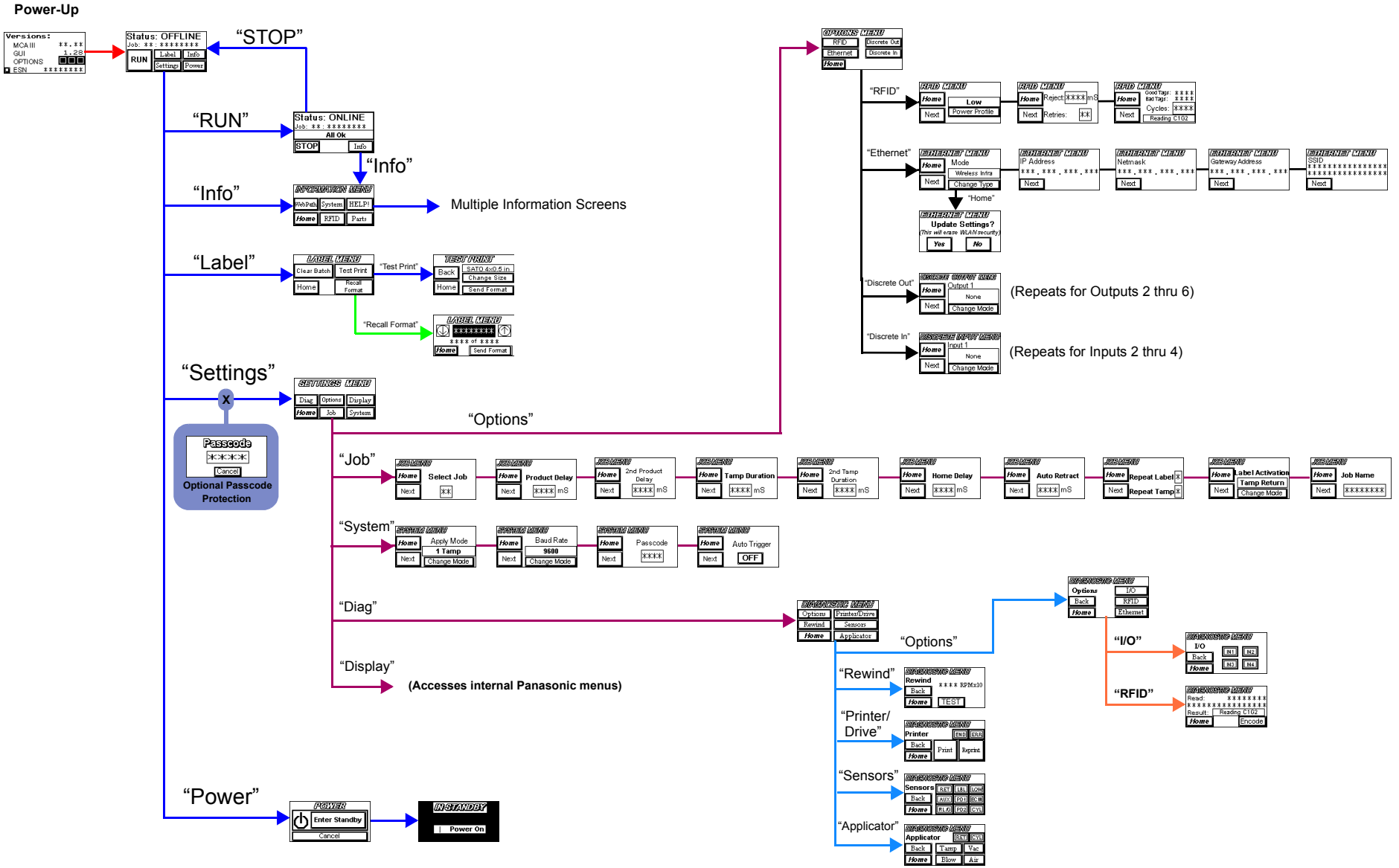
Recalling Formats

To recall a format from the USB Drive, enter the **Label Menu** from the *Home Screen*. Press the **Recall Format** button and select the format by using the arrow up and down buttons. When the desired format is located, press the **Send Format** button to load the format into the printer. It is important that the system baud rate matches the printer baud rate and the Ethernet Mode is set to Wireless Infrastructure, Wireless AdHoc, or Wired 100BaseT. The choice of Serial Com is not currently supported.

The format will contain the quantity that was stored with the label when it was designed. A typical practice is to send a large quantity (more than will be needed), and then clear the batch before sending the next one. This is easily done with the **Clear Batch** button on the Label Menu screen.

6.0 User Interface

6.1 MCA (Main Controller Assembly) User Interface



6.2 Warning, Error, and Diagnostic Codes

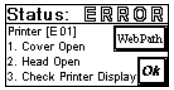
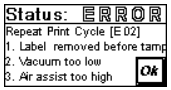
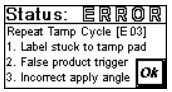
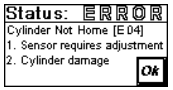
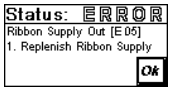
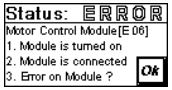
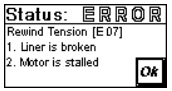
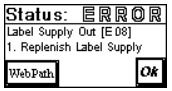
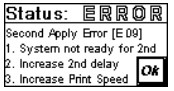
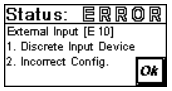
Warnings

Warnings are displayed to indicate that there is a temporary situation that may require operator intervention. These warnings to not stop machine operation. Some warnings will clear on the next successful attempt, while others require an offline pause to clear.

Warning on Display	Meaning
All Ok	Labeler operation normal; no warnings or errors
Ribbon Low (W01)	Printer reports ribbon low
Label Low (W02)	Labeler reports label low through optional Label Low sensor
No Format (W03)	Labeler wishes to print a label but no format is loaded in printer. Send format to the printer to continue operation
RFID Tag Bad (W04)	Labeler has detected a bad RFID tag during encoding process
RFID Verify Error (W05)	Labeler could not verify encoded tag information once applied to product
Serial Cmd Error (W06)	Labeler received data that did not match any known commands
Timing Violation (W07)	Labeler received a product detection trigger but could not start timing sequence, since the apply cycle was not complete. On a FASA system, this could mean that the second apply cycle has a product delay that is too short.
Label on Detector 1	Labeler is waiting for Product Detector 1 to trigger before printing the next label
Label on Detector 2	Labeler is waiting for Product Detector 2 to trigger before printing the next label
Retract Sensor (W08)	The labeler detected the optional auto-retract sensor was covered during the extension cycle, prior to product contact. This could indicate a label fed beyond the pad, and covered the auto-retract sensor, thus forcing the labeler to return from time-out only.

Errors

Errors are displayed on individual screens to show possible causes for the error. An error will stop labeler operation, and illuminate the red segment of the warning tower, if present.

Screen	Screen	Screen
E01 - Printer 	E02 - Repeat Print Cycle 	E03 - Repeat Tamp Cycle 
E04 - Cylinder Not Home 	E05 - Ribbon Supply Out 	E06 - Motor Control Module 
E07 - Rewind Tension 	E08 - Label Supply Out 	E09 - Second Apply Error 
E10 - External Input 		

Motor Control Module Codes

These codes are displayed on the 2-digit display of the MCM during operation

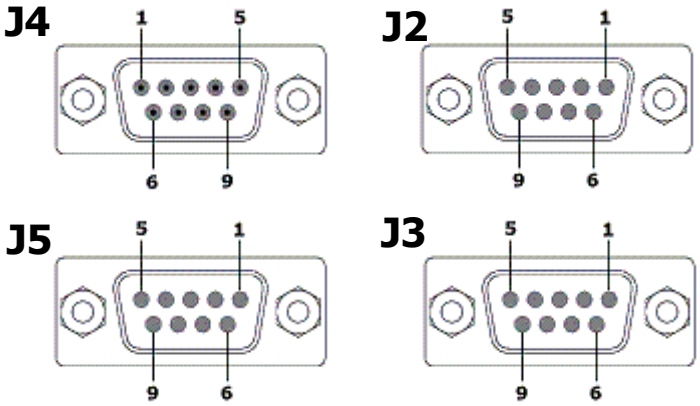
2-Digit Display	Meaning
8'8'	Power-up LED check
Pb	Push button is stuck on
Ur..... XX	Version (Vr) followed by 2-digit firmware version
E1	Error - Motor controller overcurrent, undervoltage, hall sensor error upon actuator return
E2	Error - Movement time-out. Actuator did not return home after 15 seconds
E3	Error - Motor controller driver damaged, hall sensors not connected or intermittent, power source error check at time of power-up
t..... tc	Tamping, then as movement begins, the c appears to indicate a compensation measurement
r.....rh	Retracting, then as the actuator reaches home, the h appears to indicate the actuator is now home

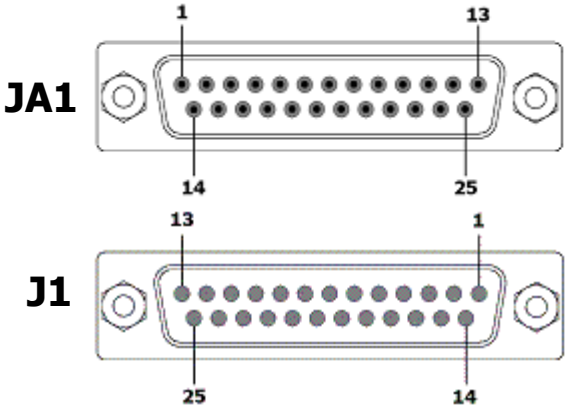
7.0 Electrical Interfacing

J4 - Auxiliary (RFID Reject)	
PIN	Pin Description
Pin 1, 2	N/C
Pin 3	Ground
Pin 4,5	Aux Input
Pin 6	+ 24 VDC Supply
Pin 7,9	N/C
Pin 8	Aux Output (Sinking)

J2, J3 - Product Detector(s)	
PIN	Pin Description
Pin 1, 2	N/C
Pin 3	Ground
Pin 4,5	N/C
Pin 6	+ 24 VDC Supply
Pin 7,9	N/C
Pin 8	Product Detect Input (NPN)

JA1 - Discrete I/O {Optional Connector Presence}			
PIN	Pin Description	PIN	Pin Description
Pin 1,2	Out Relay 1A, 1B	Pin 13	Ground
Pin 3,4	Out Relay 2A, 2B	Pin 14,15	In A+, In A-
Pin 5,6	Out Relay 3A, 3B	Pin 16,17	In B+, In B-
Pin 7,8	Out Relay 4A, 4B	Pin 18,19	In C+, In C-
Pin 9,10	Out Relay 5A, 5B	Pin 20,21	In D+, In D-
Pin 11,12	Out Relay 6A, 6B	Pin 22,23	Ground
		Pin 24,25	+24 VDC FUSED 0.5 A





J5 - Warning Tower	
PIN	Pin Description
Pin 1, 2, 3	N/C
Pin 4	Red (Ground Switched)
Pin 5	Yellow (Ground Switched)
Pin 6	+ 24 VDC Supply
Pin 7	Green (Ground Switched)
Pin 8,9	N/C

J1 - Serial Communication			
PIN	Pin Description	PIN	Pin Description
Pin 1	Shield Ground	Pin 7	Signal Ground
Pin 2	Com RX	Pin 8	DCD
Pin 3	Com TX	Pin 9-17	N/C
Pin 4	RTS	Pin 18	Switched 24 VDC
Pin 5	CTS	Pin 20	DTR
Pin 6	DSR	Pin 19, 21-25	N/C

8.0 Maintenance Schedule

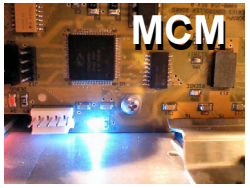
Area	Daily	Monthly	Two Years	Description
Clean Printer Feed Rollers		√		Use isopropyl alcohol and soft lint-free cloth to wipe all adhesive and paper dust free.
Replace Printer Feed Rollers			√	Follow printer manufacturer's procedures.
Replace Printer Peel Blade			√	Follow printer manufacturer's procedures.
Clean Label Present and Auto-Retract Sensors (if installed)	√			Use isopropyl alcohol and soft lint-free cloth to wipe all dust and contaminants free.
Clean Label Low Sensor (if present)		√		Use isopropyl alcohol and soft lint-free cloth to wipe all dust and contaminants free.
Clean Product Detector Sensor(s)		√		Use a soft lint-free cloth to wipe all dust and contaminants free. Be careful not to damage the plastic lens with alcohol-based solvents.
Inspect Rewind Belt		√		Check for frayed edges and exposed reinforcement fibers.
Replace Rewind Belt			√	Remove Rewind disk by taking off E-clip. Keep belt loose by holding up on the spring-loaded belt tensioner. Replace belt and reinstall the Rewind disk.
Replace Unwind Dancer Spring			√	Unwind spring can be accessed through the slots of the Unwind disk.
Clean Tamp Pad	√			Use compressed air and a hard bristle brush to clean any contaminants in the pad face. Isopropyl alcohol can be used to wipe the pad clean. **DO NOT SPRAY CHEMICALS INTO THE VACUUM FAN!**
Clean Actuator Rod		√		Clean the actuator rod with a cleaning cloth. Use a light amount of isopropyl alcohol on cloth to remove build-ups. **DO NOT USE OIL OR GREASE ON ACTUATOR ROD!**
Inspect Actuator Drive Belt		√		Check for frayed edges and exposed reinforcement fibers.
Replace Actuator Drive Belt and Bearing Pads			√	Follow replacement procedures contained with new components.
Clean Baseplate Spindle(s)		√		Use isopropyl alcohol and soft lint-free cloth to wipe all dust and contaminants free.
Replace Baseplate Spindle(s)			√	Replace by unscrewing the old spindle and replace with new spindle and some service-removable Loc-tite.

9.0 Diagnostics

Overview

The FoxJet labeler employs a built-in diagnostic testing system to allow most problems to be identified and corrected without need for more sophisticated test equipment. This is an inherent characteristic of the LS4600e and LS6000e labelers, and should be used to save time and efforts. The sections below list the capabilities and how to access them.

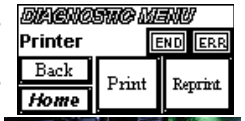
Heartbeat Light

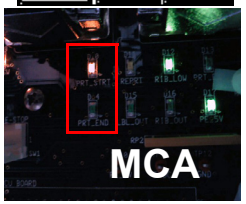


As simple as this indicator is, it can help identify a problem with the circuit boards in the labeler. All boards that contain firmware have a flashing blue LED light that indicates a normal, working module. The MCA, Ethernet Module, and MCM contain this heartbeat indicator.

Won't Print

When a labeler is placed online, there are reasons that may not seem apparent for why the label doesn't immediately feed out. First basic checks should include mode selections, like Demand Mode printing or Apply Mode is set to Wipe. Next verify a print batch is present in the print engine, and the engine is online. If all of these check out, the next steps should be to pair-down the possible causes to find the culprit. Use the Diagnostic menu in the MCA to force a print. This directly activates the print signal to the print engine. Visible on the Interface Board of the MCA (p/n:4600-350) is the yellow PRT_STRT signal LED. When this toggles, the printer should start printing and when finished, the green PRT_END signal LED should momentarily flash. If not, the problem is located outside of the MCA, possibly the applicator cable or printer.





Won't Apply

There are various reasons why a labeler will not apply a label. Most of these are justified due to the settings or the state of the labeler. The MCA display will show status like *Timing Violation, Label on Detector 1, Label on Detector 2, and Cylinder Not Home*.

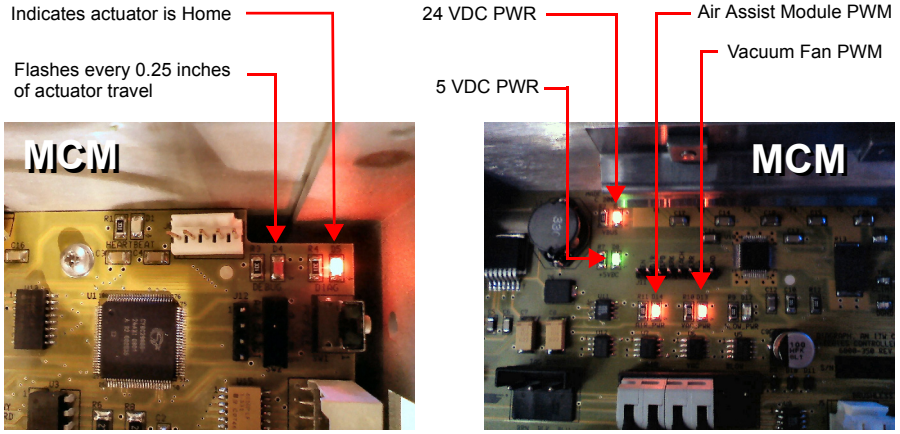
Situations that lead to missed application can be caused by formats sent to the printer too late for application or the label is missing from the pad just prior to the application time. These two events will likely cause a *Timing Violation* warning on the display.

Failure modes leading to missed or no application can be narrowed to the product detection trigger (input) and the extension of the actuator signal (output). The Product Trigger can be viewed on the green LED inside the MCA MCU Board (D9, PDET_1). It can also be viewed on the Diagnostic screen of the MCA display in the **Sensors** screen. Likewise, the output for "Tamp" can be viewed on the MCA Interface Board yellow LED (D9, TAMP). The Diagnostic menu allows for the Tamp signal to be exercised.

Electric Actuator Test

The Spec.e actuator can be tested off-system or on-system, but independent of the MCA. This is done by pressing and holding the Set button on the MCM while turning power on. The display will initially show "Pb", indicating a stuck push button. Release the Set button, and the display will show "dG" for diagnostics. The Set button can now be pressed to extend the actuator. The power must be cycled to exit the diagnostic mode.

There are diagnostic LED's dedicated to showing the actuator operation internal to the MCM. These are noted in the image below:



The LED's for Air Assist and Vacuum Fan will show a slight flicker since they are modulated to control speed. Most visible will be the Vacuum Fan LED, which will flicker more noticeable at the lower settings of the "F" fan speed on the MCM. When a label is on the tamp pad, the Vacuum Fan spins up to the set speed. After a label has been on the pad, and then take away without a new label taking it's place, the fan will slow down to an idle speed after 5 seconds. The flicker rate of the LED will show this difference in speeds between label in place and removed.

10.0 Spare Parts List - System

Part Number	Recm'd. Spare Part	Description
DOCUMENTATION		
4600-010		LS4600e and LS6000e User Manual
LS4600e and LS6000e		
4600-522		MCA Power Supply (Auto-Ranging, 24 VDC Output)
4600-511		AC Power Cord
4600-643		Unwind Dancer Arm Spindle
4600-200		MCA User Interface Touch Screen LCD
4600-951	√	Main MCU PCB Assembly
4600-500		Main Controller Assembly III (MCA III) Includes: MCU Board, Interface Board, User Interface, Enclosure
6000-350	√	MCM Motor Controller PCB Assembly
6000-550		MCM Assembly Includes: MCM Motor Controller PCB, Power Supply, Enclosure
4600-503		Rewind BLDC Motor
4600-647		Rewind Clasp
4600-950	√	MAINTENANCE KIT: Wear Items Set Includes: (2) Rewind Belts, (3) Spindles, (2/ea.) Springs, (3) Unwind Fins, (3) Web guides
6000-950	√	E-TAMP MAINTENANCE KIT: Wear Items Set Includes: Actuator Belts, Bearing Pads, Idler Rollers, Belt Clamp, Bumper, Springs, Motor Dust Cap
6000-620x10		E-Tamp Actuator Module, 10 inch stroke
6000-620x20		E-Tamp Actuator Module, 20 inch stroke
6000-666 [R or L]		Air Assist Module
6000-507		Vacuum Fan Assy.
4600-900		Product Detector - Diffused Light
OPTIONS		
6000-828		Warning Tower Assembly

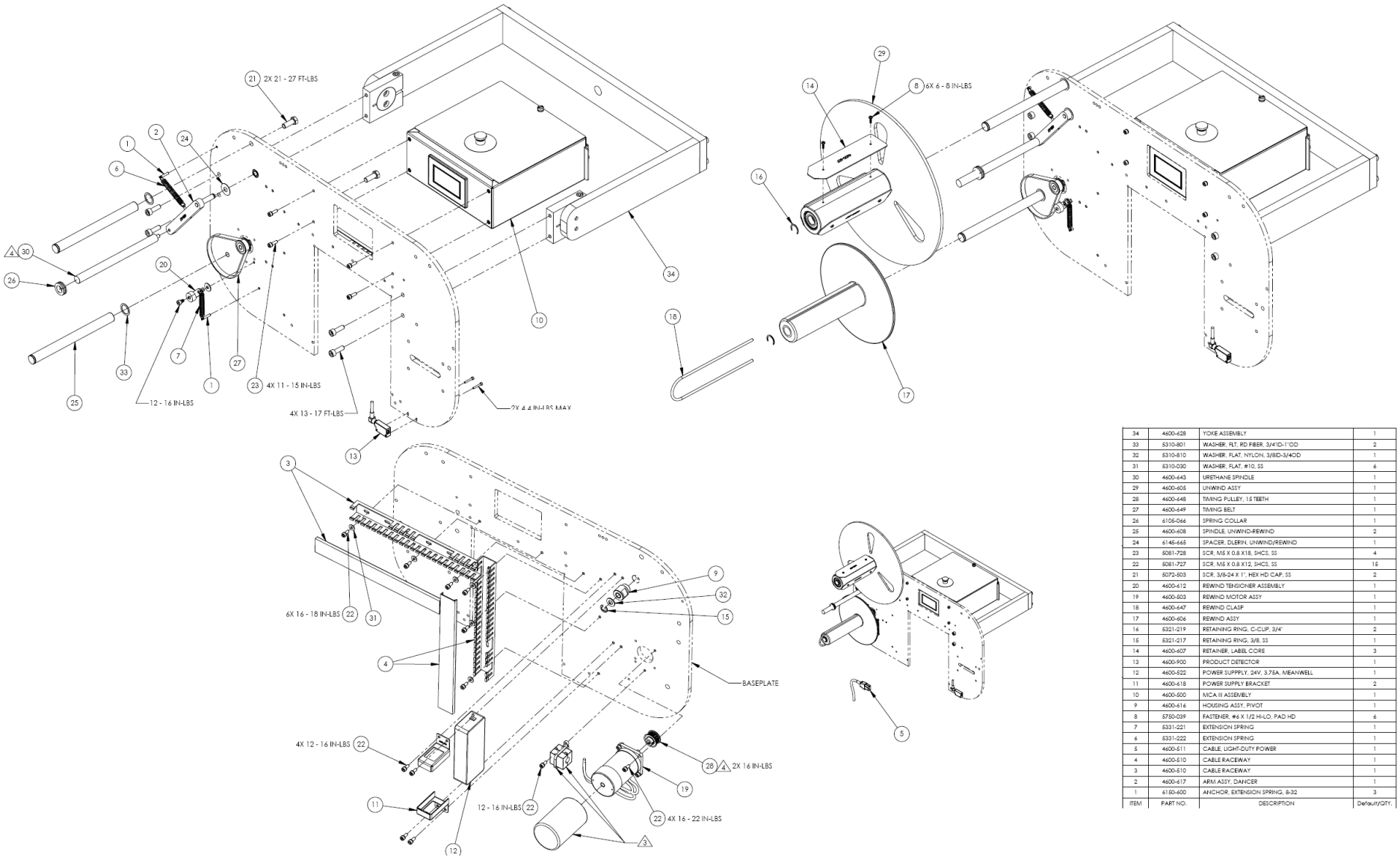
Part Number	Recm'd. Spare Part	Description
6145-501		Warning Tower Bulb Kit (Incandescent)
6145-405		Discrete I/O Board (Optional Device)
6000-903	√	Auto-retract, Label low, or Label present sensor and PUR cable (1 sensor/cable/cover per kit)

11.0 Spare Parts List - Print Engines

Part Number	Recm'd. Spare Part	Description
SATO SE Print Engine Components		
7500-020		SATO Platen Assy PR0730100
2801-451		SATO Bearing (Inner)
2850-999		SATO Bearing / Ball Supporter (Outer) PT1109050
2803-992		SATO Timing Belt PT8150064
7500-050		SATO Timing Belt PT8190064
6150-856		SATO Timing Belt PT8085048
2806-253	√	SATO 203 dpi Printhead GH000781A
2804-637		SATO Platen Roller Pulley PE8730200
11S000180		SATO Pressure Roller Assembly 11S000180
6152-117		SATO Platen Roller PR0730100
SATO Lt408 Print Module Components		
4600-800		SATO Lt 408 Print Engine (Entire Printer)
4600-810	√	SATO Lt 408 Print Head
4600-811		SATO Lt 408 Platen Roller Assy
4600-812		SATO Lt 408 Feed Roller Assy
4600-813		SATO Lt 408 Ribbon Roller Assy
4600-814		SATO Lt 408 Gap Sensor Assy.
4600-815		SATO Lt 408 Main PCB
4600-816		SATO Lt 408 Motor Drive PCB
4600-817		SATO Lt 408 Power Supply
4600-819		SATO Lt 408 Timing Belt 218mm (Ribbon Drive)
4600-820		SATO Lt 408 Timing Belt 260mm (Stepper Main)
4600-821		SATO Lt 408 Timing Belt 186mm (Platen Drive)
4600-822		SATO Lt 408 Ribbon Sensor
4600-823		SATO Lt 408 Torque Limiter (ribbon take-up)
4600-824		SATO Lt 408 Torque Limiter (ribbon supply)
4600-825		SATO Lt 408 Roller bearing (all rollers)
SATO 84xx Se Engines		

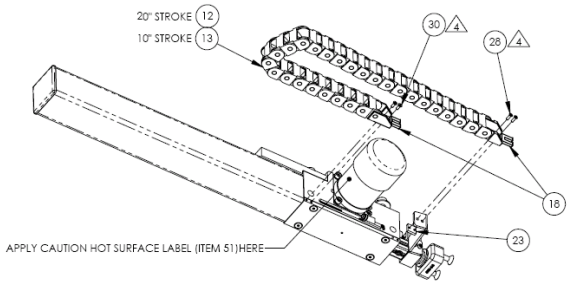
Part Number	Recm'd. Spare Part	Description
6000-6152094		Engine Assembly, Sato 8485SE
6000-6152092		Engine Assembly, Sato 8490SE
6000-6152091		Engine Assembly, Sato 8460SE
Zebra PAX Engines		
6000-6153091		Engine Assembly, Zebra 112 PAX4
6000-6153092		Engine Assembly, Zebra 113 PAX4
6000-6153089		Engine Assembly, Zebra 172 PAX4
6000-6153090		Engine Assembly, Zebra 173 PAX4

12.0 System Drawings



ITEM	PART NO.	DESCRIPTION	Default/QTY.
34	4600-628	YOKE ASSEMBLY	1
33	5310-801	WASHER, FLT, RD FIBER, 3/4"ID-1"OD	2
32	5310-810	WASHER, FLAT, NYLON, 3/8ID-3/4OD	1
31	5310-030	WASHER, FLAT, #10, SS	6
30	4600-643	URETHANE SPINDLE	1
29	4600-605	UNWIND ASSY	1
28	4600-648	TIMING PULLEY, 15 TEETH	1
27	4600-649	TIMING BELT	1
26	6105-066	SPRING COLLAR	1
25	4600-608	SPINDLE, UNWIND-REWIND	2
24	6145-665	SPACER, DLERIN, UNWIND/REWIND	1
23	5081-728	SCR, MS X 0.8 X18, SHCS, SS	4
22	5081-727	SCR, MS X 0.8 X12, SHCS, SS	15
21	5072-503	SCR, 3/8-24 X 1", HEX HD CAP, SS	2
20	4600-612	REWIND TENSIONER ASSEMBLY	1
19	4600-503	REWIND MOTOR ASSY	1
18	4600-647	REWIND CLASP	1
17	4600-606	REWIND ASSY	1
16	5321-219	RETAINING RING, C-CLIP, 3/4"	2
15	5321-217	RETAINING RING, 3/8, SS	1
14	4600-607	RETAINER, LABEL CORE	3
13	4600-900	PRODUCT DETECTOR	1
12	4600-522	POWER SUPPPLY, 24V, 3.75A, MEANWELL	1
11	4600-618	POWER SUPPLY BRACKET	2
10	4600-500	MCA III ASSEMBLY	1
9	4600-616	HOUSING ASSY, PIVOT	1
8	S750-039	FASTENER, #6 X 1/2 HI-LO, PAD HD	6
7	5331-221	EXTENSION SPRING	1
6	5331-222	EXTENSION SPRING	1
5	4600-511	CABLE, LIGHT-DUTY POWER	1
4	4600-510	CABLE RACEWAY	1
3	4600-510	CABLE RACEWAY	1
2	4600-617	ARM ASSY, DANCER	1
1	6150-600	ANCHOR, EXTENSION SPRING, 8-32	3

12.1 System Drawings - Actuator



1. THIS DRAWING DEFINES THE 6000-620X10 AND 6000-620X20 ACTUATORS. SEE BOM FOR APPLICABLE COMPONENTS.
2. THE ACTUATOR CAN BE CONFIGURED TWO WAYS. CONFIGURATION "A" IS SHOWN AND IS APPLICABLE TO RIGHT-HANDED MACHINES WITH TAMP PAD LENGTHS LESS THAN 6.75 INCHES AND FOR LEFT-HANDED MACHINES WITH TAMP PADS LENGTHS OF 6.75 INCHES AND GREATER. CONFIGURATION "B" IS ACHIEVED BY SWAPPING THE POSITIONS OF THE TAMP PAD MOUNT ASSEMBLY AND MAGNET COMPONENTS WITH THE BELT TENSIONER COMPONENTS. CONFIGURATION "B" IS APPLICABLE TO LEFT-HANDED MACHINES WITH TAMP PAD LENGTHS LESS THAN 6.75 INCHES AND FOR RIGHT-HANDED MACHINES WITH TAMP PADS LENGTHS OF 6.75 INCHES AND GREATER.

△3 INSERT AND REMOVE PINS ONLY FROM SIDE OPPOSITE OF MOTOR MOUNT.

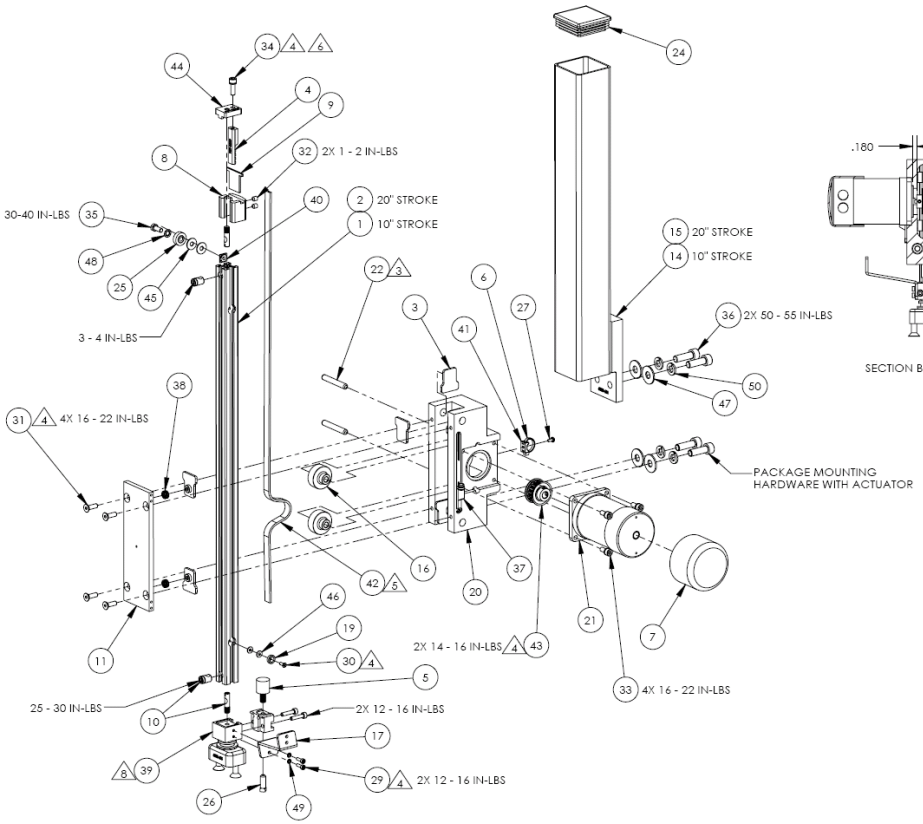
△4 APPLY LOCTITE 242 TO SCREW PRIOR TO ASSEMBLY.

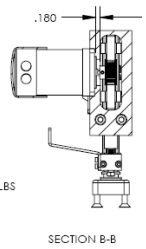
△5 CUT TIMING BELT TO LENGTH DURING ASSEMBLY.

△6 TIGHTEN SCREW UNTIL LOCK WASHER COLLAPSES, THEN TIGHTEN ONE MORE TURN.

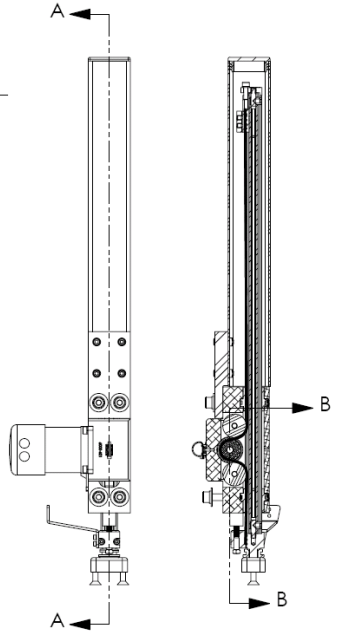
7. TIGHTEN SCREWS TO TORQUE VALUES SPECIFIED ON THE DRAWING.

△8 USE 6000-625-BLUE FOR TAMP PADS UNDER 6". USE 6000-625-RED FOR TAMP PADS OVER 6".





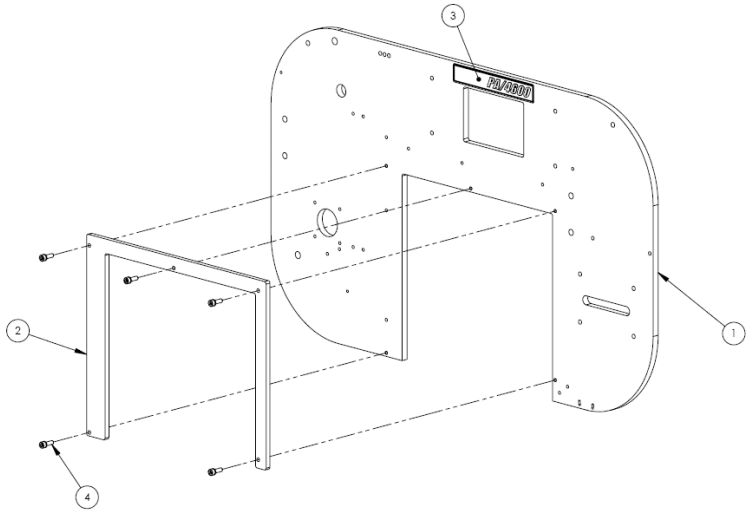
SECTION B-B



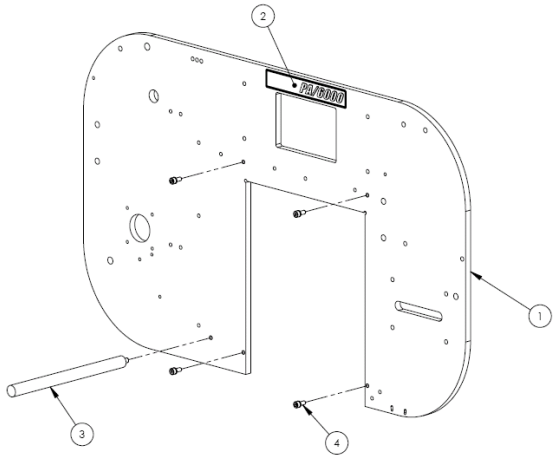
SECTION A-A

ITEM	PART NO.	DESCRIPTION	6000-620X10/QTY.	6000-620X20/QTY.
51	6000-643	LABEL, CAUTION HOT SURFACE	1	1
50	5310-308	WASHER, SPLIT-LOCK, 5/16", SS	4	4
49	5310-315	WASHER, SPLIT LOCK, #4, SS	2	2
48	5310-409	WASHER, LOCK, #10 INT TOOTH	1	1
47	5310-041	WASHER, FLAT, 5/16, SS	4	4
46	5310-037	WASHER, FLAT, #4, SS	2	2
45	5310-030	WASHER, FLAT #10, SS	2	2
44	6000-627	TOP PLATE, ACTUATOR	1	1
43	4600-648	TIMING PULLEY, 15 TEETH	1	1
42	6000-633	TIMING BELT, XL, 240 GROOVES X .375" W	1/2	1
41	6105-423	TIE MOUNT, #4 SCREW	1	1
40	6000-636	THREADED PLATE, M5, MAYTEC	1	1
39	6000-625 △8	TAMP PAD MOUNT ASSY, E-TAMP	1	1
38	5331-002	SPRING, WAVE, .375 O.D. X .15 L, SS	2	2
37	4600-906_ITEM-1	SENSOR, CYLINDER HOME	1	1
36	5081-730	SCR, M8 X 1.25 X 25, SHCS, SS	4	4
35	5072-502	SCR, M5 X.8 X 12, HEX HD CAP, SS	1	1
34	5081-728	SCR, M5 X 0.8 X18, SHCS, SS	1	1
33	5081-727	SCR, M5 X 0.8 X12, SHCS, SS	4	4
32	5030-712	SCR, M5 X 0.8 X 6, SOCSET, CUP PT, SS	2	2
31	5091-712	SCR, M5 X 0.8 X 16, FL HD SOC, SS	4	4
30	5101-601	SCR, M3 X 0.5 X 8, FL HD PH, SS	3	3
29	5081-003	SCR, M3 X 0.5 X 10MM, SHCS, SS	2	2
28	2460-147	SCR, 4-40 X 3/8, PH FH, SS	2	2
27	5152-006	SCR, 4-40 X 1/4, PAN HD, SEMS, PH	1	1
26	6000-637	SCR, 1/4-20 X 5/8", SET, SQ HD, CUP PT, SS	1	1
25	6000-638	ROLLER / BUMPER	1	1
24	6000-632	PLUG, 2-INCH SQUARE	1	1
23	4600-658	PLATE, IGUS MOUNT	1	1
22	5315-105	PIN, DOWEL, .250 X 1.75 L, SS	2	2
21	4600-503_ITEM-1	MOTOR, BRUSHLESS DC	1	1
20	6000-621	MAIN BODY, ACTUATOR	1	1
19	6145-667	MAGNET, RARE EARTH	1	1
18	4600-514	IGUS MOUNTING BRACKETS (SET)	1	1
17	4600-611	IGUS MOUNT, TAMP CYLINDER	1	1
16	6000-623	IDLER ROLLER	2	2
15	6000-631L	GUARD ASSY	-	1
14	6000-631	GUARD ASSY	1	-
13	6000-515_27	ENERGY CHAIN, IGUS	22"	-
12	6000-515_41	ENERGY CHAIN, IGUS	-	33"
11	6000-622	COVER PLATE, ACTUATOR	1	1
10	6000-635	CONNECTOR ASSY, MAYTEC	2	2
9	6000-629	CLAMP PLATE	1	1
8	6000-628	CLAMP	1	1
7	6000-634	CAP, VINYL, ROUND	1	1
6	6150-580	CABLE TIE, 87" DIA. BLK NYLON	1	1
5	6150-601	BUMPER, 5/8" MALE, POLYURETHANE	1	1
4	6000-626	BELT TENSIONER	1	1
3	6000-624	BEARING PAD	8	8
2	6000-630L	ACTUATOR EXTRUSION	-	1
1	6000-630	ACTUATOR EXTRUSION	1	-

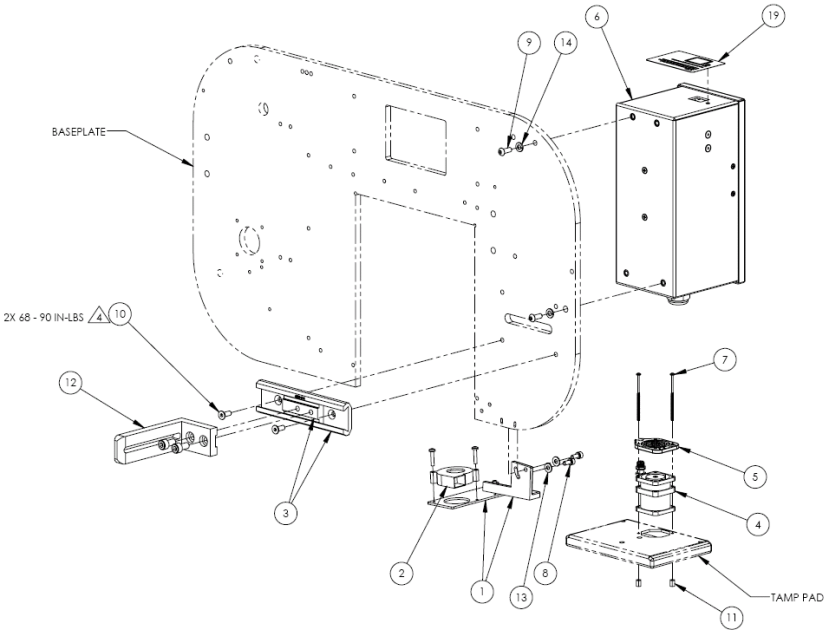
12.2 System Drawings - E-Tamp Components



ITEM	PART NO.	DESCRIPTION	MFR. / VENDOR	QTY.
4	5081-728	SCR, M5 X 0.8 X18, SHCS, SS		5
3	4600-850	PA/4600 NAMEPLATE DECAL		1
2	4600-609	PRINT ENGINE SPACER		1
1	4600-600	PA/4600 BASEPLATE		1



ITEM	PART NO.	DESCRIPTION	MFR. / VENDOR	QTY.
4	5081-727	SCR, M5 X 0.8 X12, SHCS, SS		4
3	4600-643	URETHANE SPINDLE		1
2	6000-850	PA/6000 NAMEPLATE DECAL		1
1	6000-600	PA/6000 BASEPLATE		1



ITEM	PART NO.	DESCRIPTION	Default/QTY.	
19	6000-642	OVERLAY, MOTOR CONTROL MODULE	1	
18	6000-513	CABLE, VACUUM FAN	1	5 7
17	6000-512	CABLE, AC POWER, 3-BRANCH	1	7
16	6000-510	CABLE ASSY, E-TAMP CONTROL	1	5 7
15	6000-509	CABLE, HOME SENSOR INTERFACE	1	6 7
14	5310-313	WASHER, SPRING, 1/4", SS	2	
13	5310-030	WASHER, FLAT, #10, SS	2	
12	4600-642	TAMP APPLICATOR MOUNTING BRACKET	1	
11	5350-007	STANDOFF, 4-40 X 5/16, 1/4" OD, HEX	2	
10	5091-713	SCR, M6 X 1 X 16, FL HD SOC, SS	2	
9	5241-717	SCR, M6 X 1 X 16, BUT HD CAP, SS	2	
8	5081-727	SCR, M5 X 0.8 X12, SHCS, SS	2	
7	5151-508	SCR, 4-40 X 2-1/2", PAN HD PH, SS	2	
6	6000-550	MOTOR CONTROL MODULE	1	6
5	6000-654	FAN GUARD	1	
4	6000-507	FAN ASSY, 2-STAGE	1	6
3	4600-630	DOVETAIL MOUNTING HARDWARE	1	
2	6000-508	BLOWER ASSY	1	5
1	6000-650R	AIR ASSIST MOUNT ASSY, RIGHT	1	3

13.0 Declaration of Conformity

DECLARATION OF CONFORMITY

FoxJet, an ITW Company, hereby declares that the equipment specified below has been tested and found compliant to the following directives and standards-

Directives:

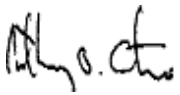
- EMC 89/336/ECC
- Low Voltage 73/23/EEC

Equipment Type:

Printer / Applicator

Model Number:

LS4600e and LS6000e



Bruce Castro
Quality/Safety Manager
FoxJet, an ITW Company
1 Missouri Research Park Dr.
St. Charles, MO 63304
USA

Standards:

- Conducted Emissions (EN55 011)
- Harmonics (EN 61000-3-2)
- Flicker (EN 61000-3-3)
- Radiated Emissions (EN55 011)
- Electrostatic Discharge (ESD) (EN 61000-4-2)
- Radiated Immunity (EN 61000-4-3)
- Fast Transient Burst (EN 61000-4-4)
- Surges (EN 61000-4-5)
- Conducted Immunity (EN 61000-4-6)
- Power Frequency Magnetic Field (EN 61000-4-8)
- Voltage Dips and Interrupts (EN 61000-4-11)
- Information Technology (EN60950-1:2001)

CE