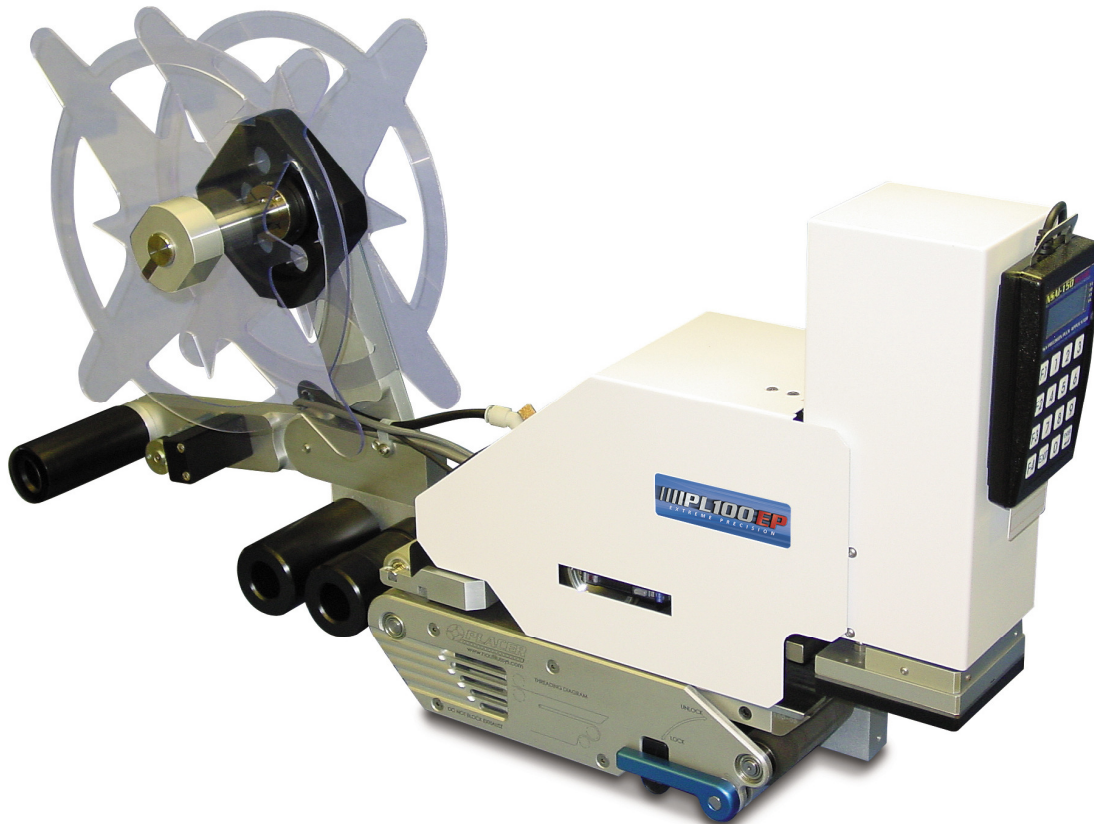


Placer 100-EP™ APPLICATOR

106362

Placer 100-6-EP Rev-e
Software Version 1.03 and Later



Applicator Approximately 18.1 kg (40 lbs.)

MANUFACTURED BY NAUTILUS SYSTEMS, INC.
www.nautilussys.com

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1) Applicator Models

PL 50-175RT90 Has a 175mm stroke tamp for retracted, pickup and placement positions mounted on a 90 degree rotary air cylinder to extend out for placement onto the side of a product.

PL 100i Has a three stage tamp for retracted, pickup and placement positions.

PL 100r Is designed for integration with a robotic pick arm that will remove the component from the carrier liner after the part has been fed out and the blade has retracted.

PL 100f Is designed for integration with an external operation that will interface with the presented components on the carrier liner for processing and then will roll the material onto a hub.

PL 165i Has a three stage tamp for retracted, pickup and placement positions, that can handle parts up to 165mm wide by 100mm long.

PL 165r Is designed for integration with a robotic pick arm that will remove the component from the carrier liner after the part has been fed out and the blade has retracted. This machine can handle parts up to 165mm wide by 100mm long.

PL 165f Is designed for integration with an external operation that will interface with the presented components on the carrier liner for processing and then will roll the material onto a hub.

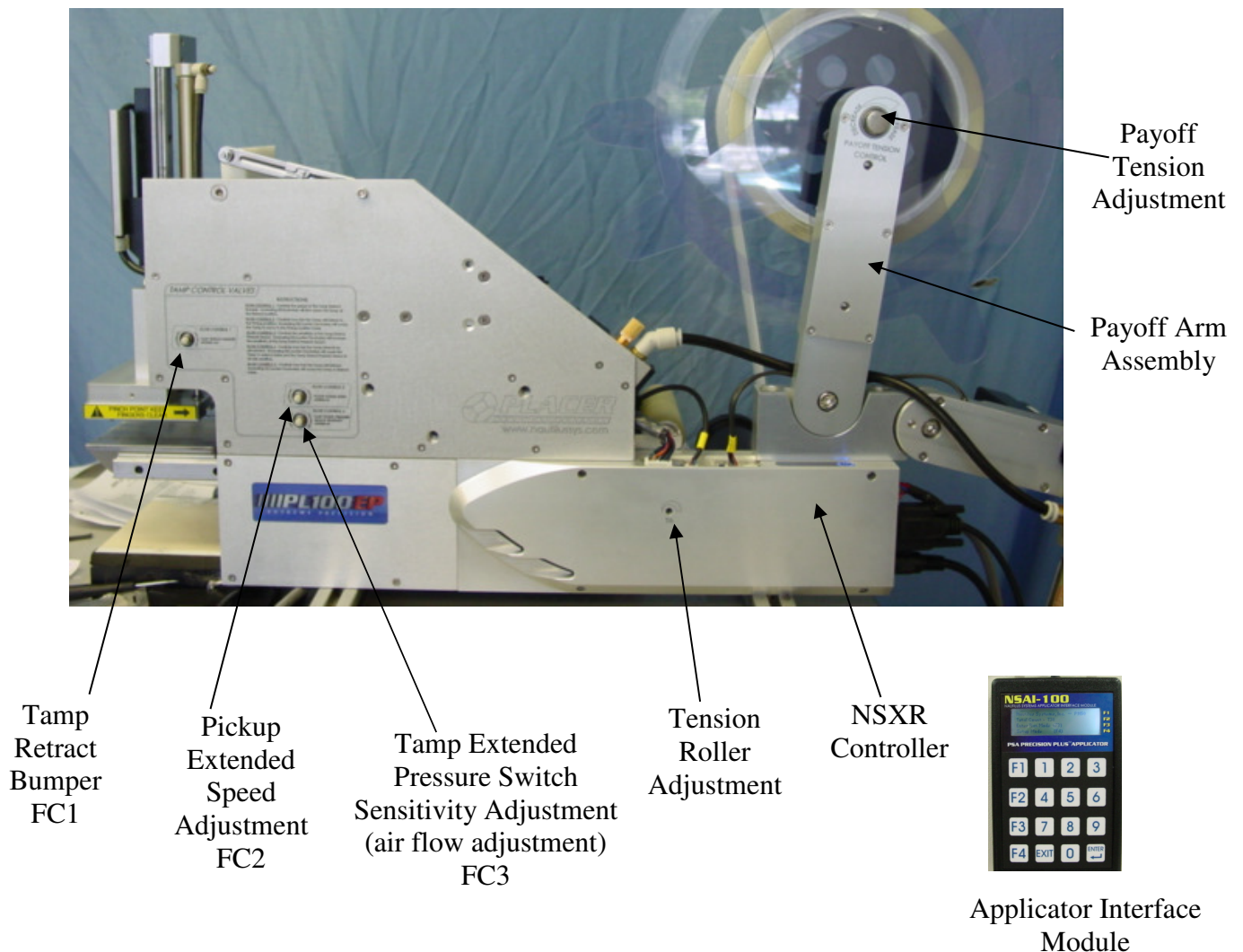
End prefix:

T:	Table Top	All applicators can be mounted on a series 1 base.
I:	Integrated	All applicators can be integrated into an assembly cell.
R:	Robot Mode	All applicators can be used to interface with a robotic arm.
F:	Feeder Model	This applicator can be used to interface with an external process.
MS:	Micro-Step	This system has micro-stepping amplifiers for high resolution feed.
EP:	Extreme Precision	Some Placer applicators can be configured with an Encoder Module and micro-stepping drives for higher accuracy requirements.
ML	Micro Locate	Has stopper cylinder integrated to stop the tamp before final placement.
IL	Inner Leaf	Has an additional peel edge and takeup to remove an inner leaf liner for double sided adhesive parts.
DF	Dual Force	The applicator has been configured with dual tamping cylinders for maximum placement force (approx 22.6 kg (50 lbs))
SPT:	Stepper Tamp	Some applicators can be configured with a Stepper Driven Tamp.
ST:	Servo Tamp	Some applicators can be configured with a Servo Driven Tamp.
RT90	Rotary Tamp	Has a tamp for retracted, pickup and placement positions mounted on a 90 degree rotary air cylinder to extend out for placement onto the side of a product.
RT180	Rotary Tamp	Has a tamp for retracted, pickup and placement positions mounted on a 180 degree rotary air cylinder to flip up for placement onto the bottom side of a product.
SS	Side Scan	Has an optional Side Scan Tamp which senses the component in the Y direction and centers over the part before picking it up. It will then move back to a central position for repeatable placement.

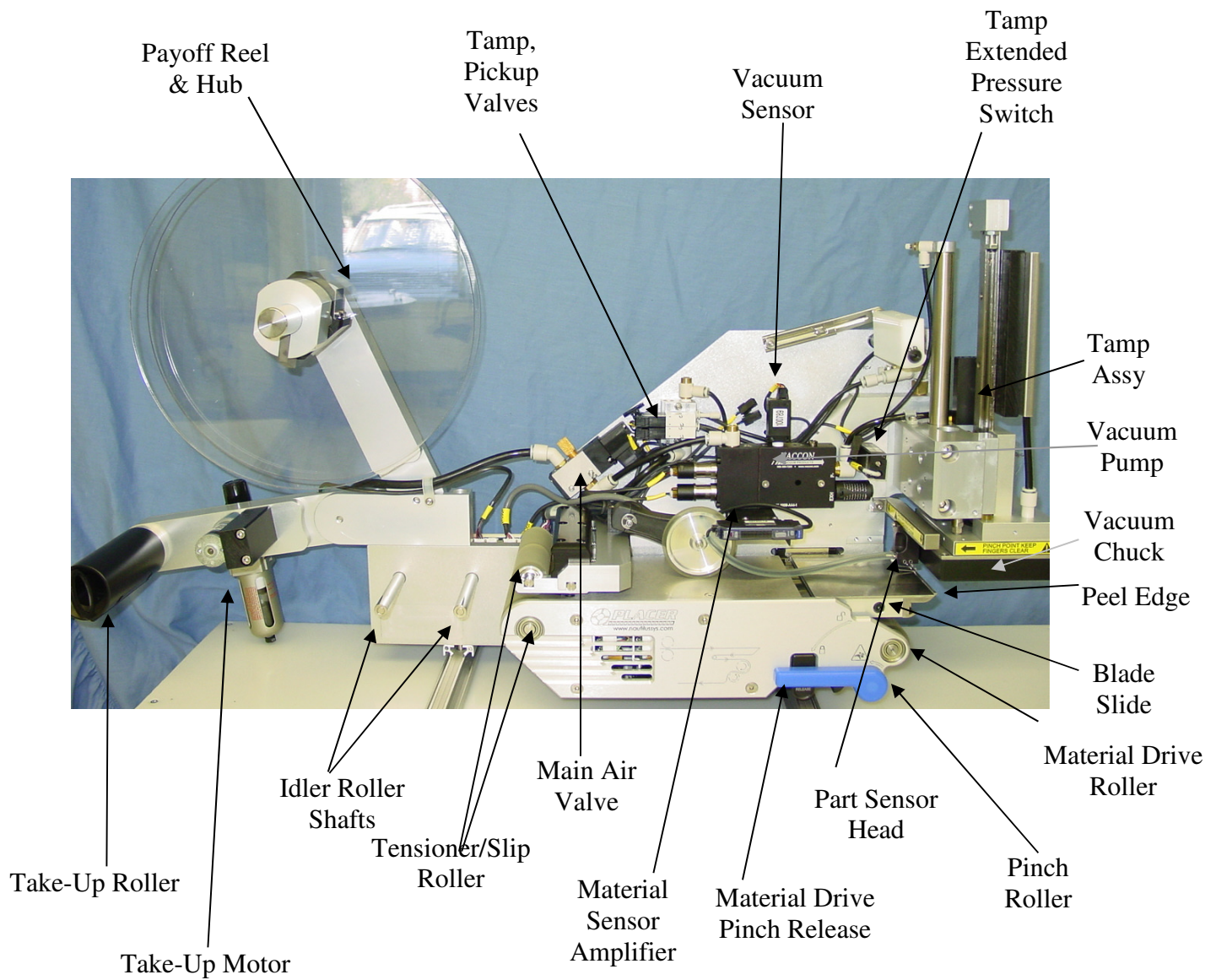
2) Applicator Overview

The Placer 100™ Applicator is a high-speed, PSA (**P**ressure **S**ensitive **A**dhesive) precision component application system. This model can be mounted over an automated material handling system and become part of an integrated production line or utilized as a standalone semi-automatic production applicator when placed onto a production platform. The Placer™ has an innovative modular approach to its design that allows complex assemblies to be interchanged with ease.

a) External Applicator Components

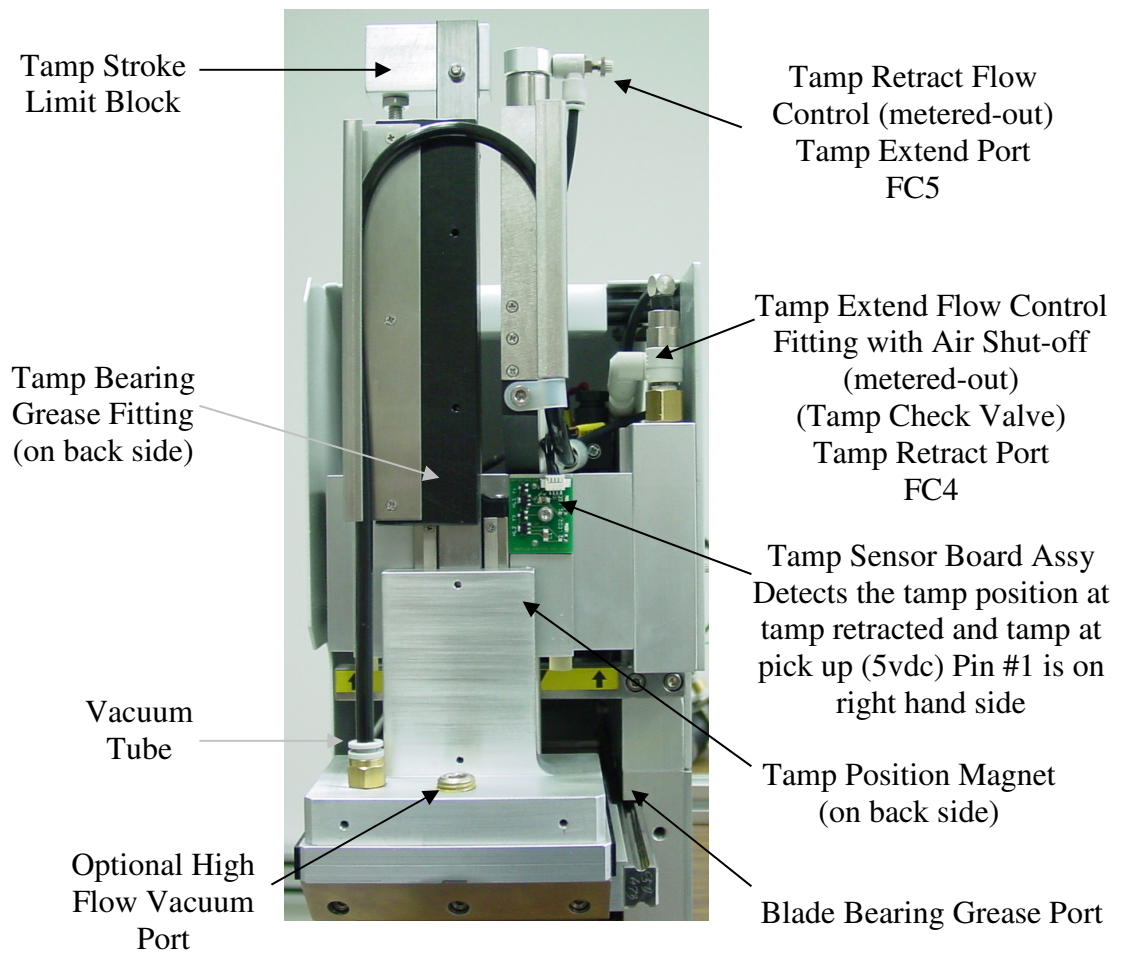


b) Internal Applicator Components



c) Front Applicator Components

Pneumatic Tamp Shown



3) Applicator Specifications

The following information is typical of a standard Placer 100 applicator.

PLACER 100-5-EP Applicator Specifications	
Weight	18.1 kg (40 lbs)
Certifications	2HATD Cycle Controls Safety Interrupt (If On A Series 1 Base)
Operating Temperature	10 - 37.8° Celcius (50 - 100° Fahrenheit)
Power	OCP Auto Switching 100-240 VAC 47/63 Hertz 3.2 Amps @ 110VAC 1.6 Amps @ 220VAC
Air	.41 - .69Mpa (60-100psi) Recommended .5MPa (72psi) Clean, Dry With No Oil Present In The Air
Air Consumption	180 l/m (6.35 cfm)
Allowable Mounting Configurations	Horizontal (Standard), Vertical, 45 Degree Angle, Upside Down(Contact Nautilus)
Cycle Time	4 - 1 seconds (15 - 60 Parts Per Minute) (Component Dependent)
Placement Accuracy	± 0.05 - ± 0.2mm (.002-.008in) (Component Dependent)
Component Detection	Fiber Optic Sensor / Vacuum Switch
Maximum Vacuum Pressure	-84 kPa (-12.2psi) ~20" Hg (~677mbar)
Material Centerline (from chassis plate)	60mm (2.36in)
Allowable Carrier Tape Width	100mm (3.94in)
Allowable Component Size	Width 100mm (3.94in) Length 100mm (3.94in)
Allowable Component Height	7mm (.2760in)
Minimum Part Spacing	2mm (.079in) (4mm Recommended)
Allowable Reel Size	I.D. 74.8 - 77.8mm (2.95 - 3.06in) or 151 - 154mm (5.95 - 6.06in), O.D. 406.4mm (16in) Max
Maximum Take up Material Diameter	158mm (6.22in) Bulk Takeup Max 230mm (9in)
Recommended Carrier Tape Lead-in	1625mm (64in)
Recommended Carrier Tape Type	Clear Polyester
Recommended Carrier Tape Process	Slitting And Image Die On The Same Die
Material Drive Resolution	0.02mm (.0008in) 56 pulses per mm
Payoff Load Capacity (max)	9.09Kgs (20lbs)
Maximum Placement Force	11.34kgf/cm ² (25 lbs) @ .55Mpa (80psi) Placement Is Adjustable With A Pressure Switch
Placement Stroke	170mm (6.69in)
Cycle Input Duration	Maintained Until Ready Output Turns Off
Applicator Internal Inputs	Sinking / Sourcing (Vacuum Switch)
Applicator Internal Outputs	Sourcing

Contact *Nautilus Systems, Inc.* for any questions or non-standard options needed.

Attention:

Before any installation or hookup, thoroughly read and understand this included manual. Verify all applicator functions and safety devices to be sufficient for its' intended use. Do not allow any untrained or non-technical personnel to adjust or service this applicator at any time. Disconnect the power before any service or removal of any components of the applicator. The applicators' inline power supply contains high voltages and should not be opened or disassembled for any reason. All service will be made at *Nautilus Systems, Inc.*

4) Applicator Safety

This applicator has been designed with many safety features in place to insure safe and reliable operation for years to come.

Included safety features:

1) Machine guards and covers.

There is a main cover with a latch to keep hands and articles out of the feed and sensing area. The tamp covers have been design to eliminate almost all pinch points during tamp movement. Caution there is a possible crush point between the tamp and the blade edge and between the tamp and the part sensor bar. Those locations are clearly marked with indicator labels pointing out the crush point areas. Please refer to the next page for specific images of these danger zones.

2) Stepper Amplifier Power Loop Circuitry.

The power to the amplifiers is provided through the external i/o connection. When this circuit is opened it will disconnect power to the stepper amplifiers, and will halt the program from any future movement until the circuit is connected and the machine is placed back in run mode.

3) Anti-drop tamp check valve

When air is removed or e-stop circuit is pressed the check valve will close and prevent the tamp from extending down.

4) Low force tamp design

The single force tamp will reach maximum placement force of 25 lbs at 80 P.S.I and 50 lbs at 80 P.S.I. for the dual tamp force setup plus inertia of tamp z-axis assembly.

5) Tamp extended placement pressure sensor.

Part placement is monitored by a pressure sensor that will detect the tamp impacting an object and will tell the machine to retract the tamp after the tamp dwell time and puff time is reached (adjustable).

6) Low voltage design.

All the electrical connections in this applicator are 24VDC or less. The only high voltages are located in the inline power supply.

7) Series 1 Base (Optional)

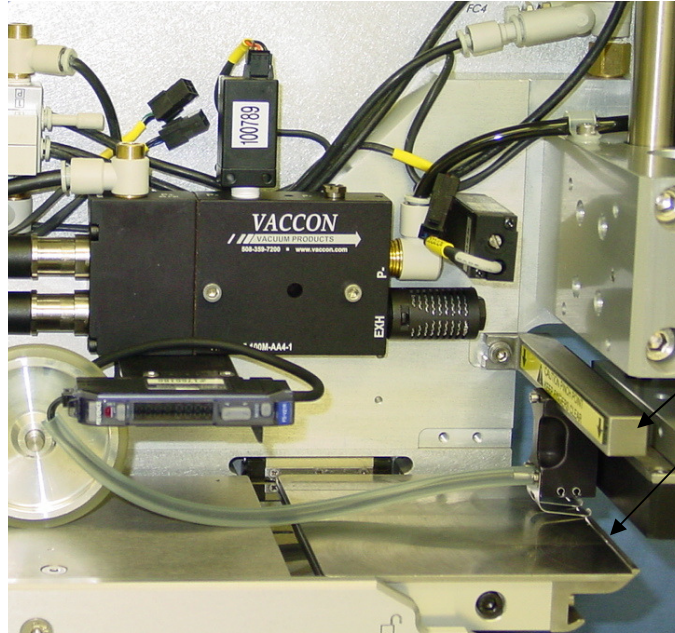
Two Hand Anti-tie down Circuitry. We use a Banner At-FM-2A safety module for cycling of the applicator. An operator must place a finger from each hand simultaneously into the optical non-contact buttons to actuate the tamp for placement.

The E-stop switch, when initiated will turn off the main air valve that removes all air from pneumatic system and halt the program from any future movement until the e-stop is unlatched and the machine is placed back in run mode.



Caution!!
Follow all caution signs
and do not remove any
machine covers .

a) Applicator Safety (continued)



**Caution
Crush
Point Area**

Above image shows the crush point location.

If a person sticks their finger in this area while the tamp extends and retracts passed the sensor mount bar and blade edge this person **could have their finger crushed or broken!!!**

Keep any body parts away from this area while the applicator is cycling.

Do not run this applicator while any one else is around this machine!!!!



Lock-out/Tag-out Procedure.

This machine does not have a lock-out tag-out feature built in. It is the responsibility of the end user to implement their own systems if Lock-out/Tag-out is required.

5) Setting Up Your Placer™ Applicator

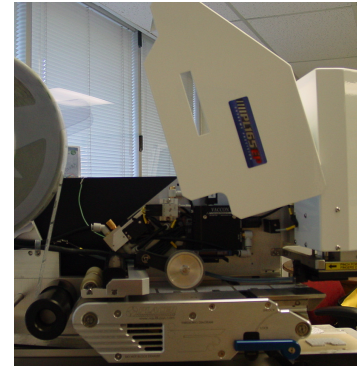
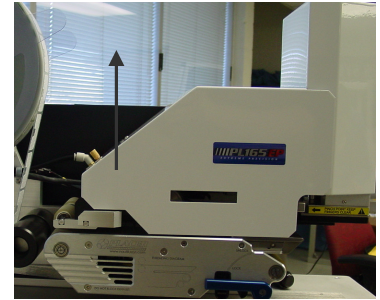
a) Unpacking Your Placer™

After carefully unpacking the system from its crate, inspect it for any damage that may have been sustained during shipping and report this to the shipper. Also check for any loose screws or wires. Contact Nautilus Systems technical support so that we may assist you in assessing the damage, or if you think the damage will cause the machine to malfunction.

Remove all of the shipping restraints shown.

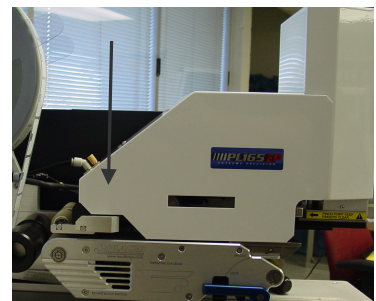
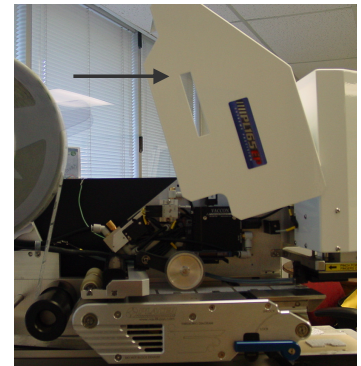
b) Applicator Hood

To open the applicator hood, lift up and open it to the right until the hood just touches the tamp cover and then gently let it back down until the lid-stay stops it.



To close the applicator hood, lift it up all the way until it just touches the tamp cover and then gently let the cover back down and latch it into the hood latch.

Do not force the cover down past the lid-stay!!

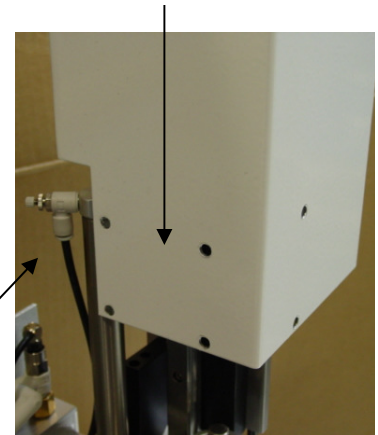


c) Applicator Tamp Covers

To remove the applicator tamp main cover, unscrew the six button head screws on the side and back of the cover and lift it straight up carefully.

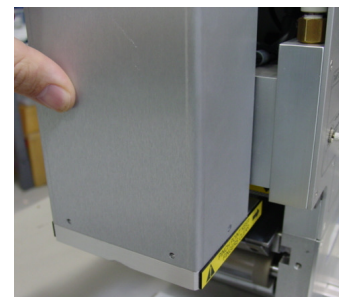


To replace the tamp main cover, make sure the tubes and wires are clear behind the tamp base block and make sure the tamp cylinder elbow flow control is pointed toward the back corner of the cover so it is held in the corner of the cover to keep it away from the moving tamp slide assembly and slide it down and install all six button head screws.



To remove the gray moving tamp cover remove the four button head screws and lift it off.

To replace the moving tamp cover slide it on and install the four button head screws securely.



d) Mounting Your Placer™

If your system was purchased as an i series model then it must first be mounted on an appropriate base or stand while using the mounting holes provided on the bottom of the chassis. The Placer™ has three M8 threading holes that have a depth of at least 10mm. Also there are two M6 dowel pin holes with a depth of at least 3.2mm with one hole slightly elongated.

When choosing a mounting location, the applicator should be isolated from any liquids, hazardous machinery, air-born debris, and high amounts of static discharge, or where debris can fall onto the applicator and short out electrical components. Any of these conditions can interfere with normal applicator function.

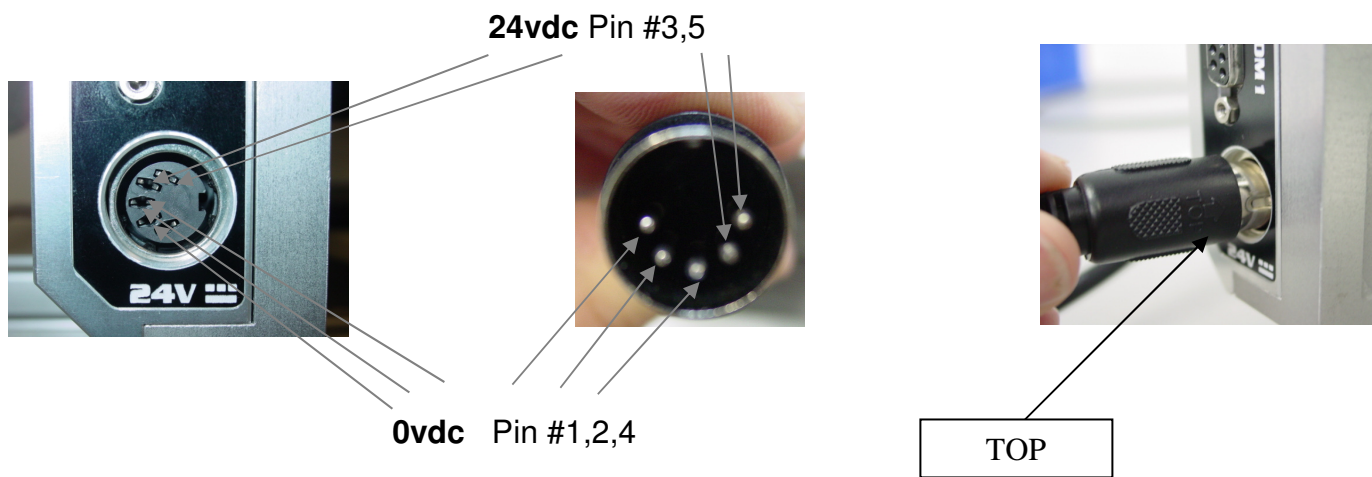
Note: Make sure that the exhaust louvers and fan intake are not covered or within 2" (50mm) of any objects that would restrict machine airflow. This applicator requires proper airflow to prevent overheating.

e) Power Requirements

Power:

The rear panel of the applicator houses the power inlet connection (24VDC). Your Placer™ comes equipped with a power supply system that allows it to be used almost anywhere in the world. It requires a power source of 100-240 VAC 47-63hz 3.2 amps. It is supplied with a North American standard three-prong power cable for 110 VAC. It is critical that it is plugged into a **GROUNDING SOCKET** before use. Special cords or power supplies are available for other power requirements from Nautilus Systems Inc. Besides the supplied 24VDC power supply, others can be used as long as the specifications and over-current protection match accordingly. Make sure the output pins are not bent before plugging the power supply into the wall outlet. The identifier on the 24VDC connection named (TOP) needs to be on the right hand side.

24VDC Connection



Standard Power Cord Type: NEMA 5-15/IEC 320, SVT, 18/3 Awg, 6' Length (included)

Total length from back of applicator to power cord plug in distance with 6 ft power cord = 3m(10 ft)
9 ft power cord = 4m(13 ft)



There is a main fuse on the applicator controller. If you connect power and the applicator will not power up after pressing the power button, contact NSI for instruction to troubleshoot a possible short.

f) Air Requirements

Air

The Placer™ requires a minimum .5 MPa (72 psi) of **clean, dry air with no oil present in the air system**. If your applicator is supplied with a factory air regulator then an 8mm pneumatic hose will fit the inlet side of the unit. If not supplied with a factory air regulator, you will use the Main Air Valve entry 1/8" N (PT) fitting or 8mm fitting and will need .5 MPa (72 psi). Refer to the supplied Applicator Setup Specs Sheet for your exact setup requirements. **Do not exceed .69 MPa (100 psi) on any of the pneumatic connections of the applicator**. If your factory pneumatic system has oil or water in it, air service units are available from *Nautilus Systems Inc.* Contact technical support for advice on selecting an air service unit.

Main Air Inlet Valve 8mm tube or 1/8-inch NPT port. When the Placer is not in run mode set the pressure to match the green indicator.



Part #	Description
100603	Air Filtration Unit
100790	Replacement Filter Air Filtration
100752	Air Regulator Assembly
100279	Power Cord, PC, 6 Foot
100951	Power Cord, PC, 9 Foot
106582	Power Cord, PC Asia/UK 2.5M 8.2ft
106322	Power Supply External 24VDC 5.4 amps (130 watts)

Refer to the next page for initial start up procedures.

g) Initial Start-up Procedures

- 1) Connect the round DC power cable from the black inline power supply to the applicator with the label "TOP" on the right side and then connect the female end of the AC power cord into the inline power supply with the male end connected to a 110-220VAC grounded outlet.
- 2) Connect the Applicator Interface Module to the Applicator Interface port on the back of the applicator and fully tighten the thumbscrews.
- 3) Connect the take up connector into the (TU1 or TU2) take up connection.
- 4) Connect the supplied External I/O cable coming from the applicator production base. If the applicator is not on a production base, connect an external automation control system to the External I/O port using the supplied External I/O cable (106343) as shown in the manual.
- 5) Hook the applicator main air regulator to a compressed airline in your factory. If this machine is supplied with an air filtration unit, connect it just upstream of the applicator main air regulator.

DO NOT TURN ON THE APPLICATOR SYSTEM UNTIL ALL ABOVE CONNECTIONS ARE MADE!

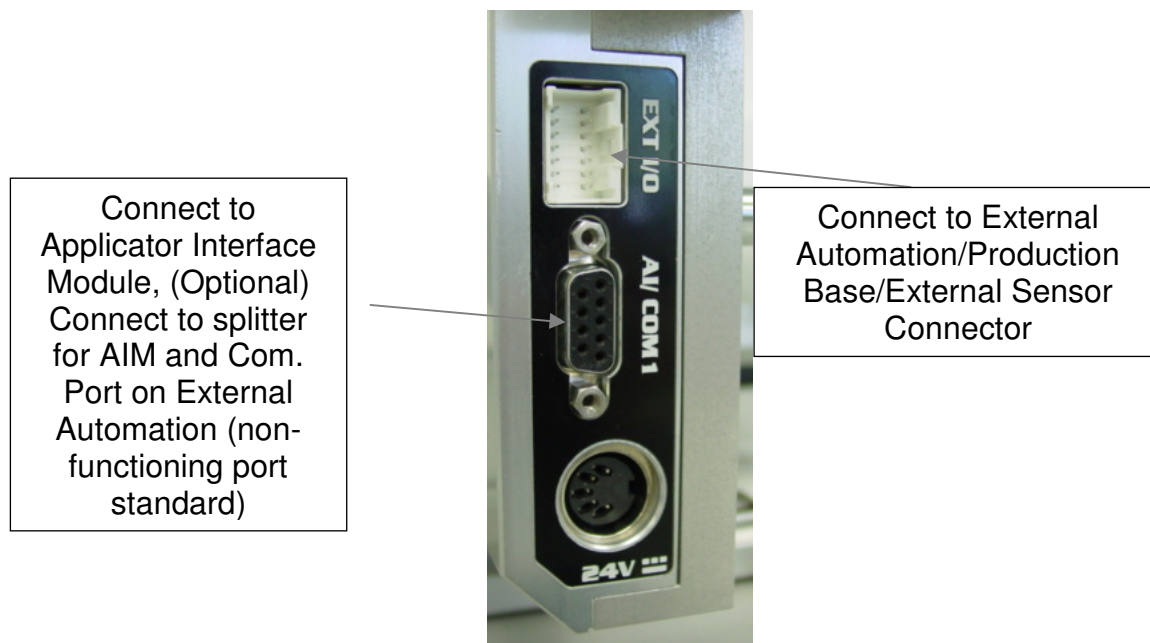
CLEAR APPLICATOR AREA BEFORE CYCLING THE APPLICATOR!

CAUTION HIGH VOLTAGES MAY BE PRESENT IN IN-LINE POWER SUPPLY!

- 6) Unlatch all E-stop Switches.
- 7) (Power up) Press and hold the power button on the applicator for approximately one second. To have the system auto-boot, refer to the chapter under Applicator Control on how to move the jumper to the auto-boot position.

When the system turns on, and if the AIM (Applicator Interface Module) reads e-stop is pressed, unlatched any e-stop switches or the e-stop circuit may not be properly interfaced with the External I/O.

Rear connection panel of the applicator.



h) Attaching Your Custom Component Tooling (CCT™)

If your system was set up by the factory for the component you are going to apply, the blade pad, idler roller, will be included with the shipment. Also the slip rollers should already be installed in their correct locations. Some slip rollers are fixed and others are adjustable by sliding the e-clip in or out on the shaft. You will need to attach the vacuum chuck to the tamp head magnetic plate on the tamp with the beveled edges toward the outside or with the vacuum pad closest to the retracting peel edge and then proceed to “Threading The Carrier Tape” on next page.

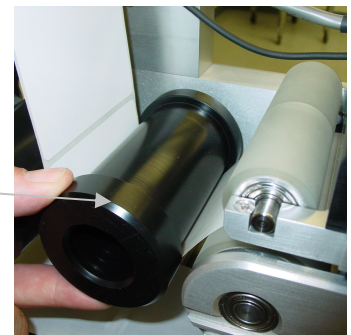
The Placer™ comes standard with magnetic couplings on almost all of its CCT™ parts. This makes installation and removal simple.

The **Vacuum Chuck** and **Tru-Trak Blade Pad™** come with alignment holes which are designed to locate on pins on the bottom of the tamp head and on top of the blade. Align these features and snap the vacuum chuck onto the tamp head, and the **Tru-Trak blade pad™** on top of the retracting blade. The magnets and locate pins should properly align and seat the parts. No other adjusting or plumbing is required.

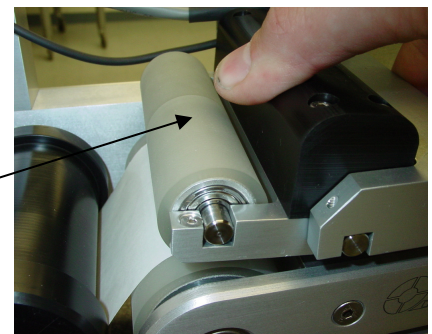
When mounting the **Vacuum Chuck** locate it onto the tamp with the beveled edges toward the outside of the machine or with the vacuum pad closest to the retracting peel edge.

When mounting the **Blade Pad** locate it on the retracting blade with the angled edge that is underneath toward the right or next to the retracting peel edge. Make sure to slide the blade pad in from the left to the right to avoid damaging the part sensor spring feet or mis-aligning the part sensor head. The blade pad will go on easier if the blade is fully retracted.

Next, slide the **Idler Guide Rollers** onto the shafts below the pay-off (again the magnetic couples will hold the rollers in place).



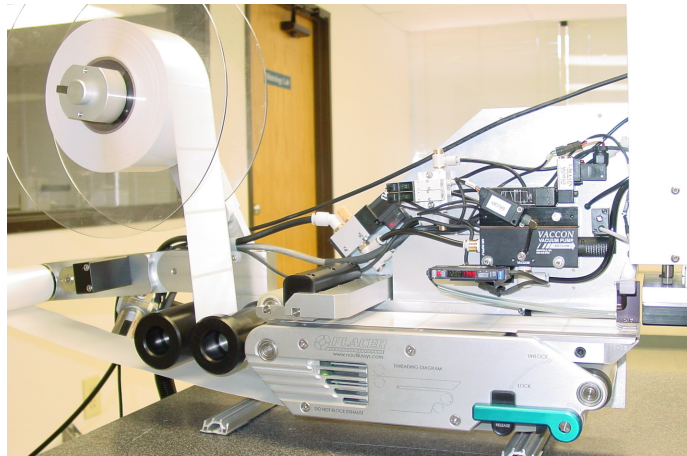
To install the **Slip Rollers**, remove the two **Flathead Screws** securing the shaft. Install the roller as shown, then replace the shaft and screws. If your Slip Rollers are adjustable then you will need to install an e-clip on each side of the Slip Rollers.



i) Threading the Carrier Tape

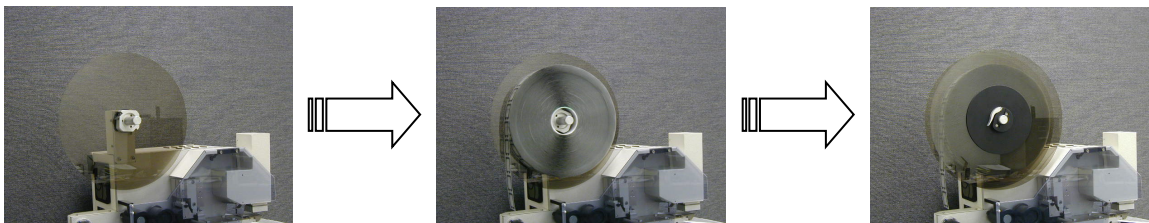
(Standard Carrier Tape Threading Shown)

Please refer to separate insert page “Recommended Carrier Tape Threading” in back of manual for specific threading instructions.



To correctly thread the blade of a Placer applicator you must have the blade all the way extended out. You can either select the blade extend option on the applicator interface module or press the e-stop button or disconnect power and manually put the blade out by hand.

Note: It is necessary to follow the threading instructions exactly as incorrect threading may cause the Placer™ to malfunction.



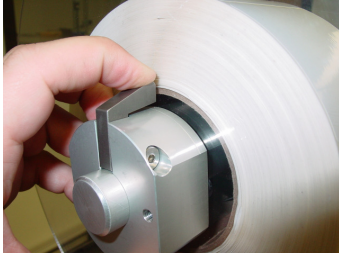
The 3-inch (76.2mm) and the 6-inch (152.4mm) **Payoffs** are equipped with hub clamps and bi-directional hub lock springs, with a maximum payoff load weight of 20lbs and 9.09kgs. The 3-inch hub will accept 2.95in-3.06in (74.8mm-77.8mm) cores and 6-inch hub will accept 5.95in-6.06in (151mm-154mm) cores. This feature allows for variations in material core internal diameter. The spring plate must be located in the correct position depending on the payoff direction.



j) Threading the Carrier Tape (continued)

Follow these instructions for a standard step by step threading of a Placer Applicator.

1) Remove all old material from the applicator. You will have to release the pinch lever arm to pull out the material through the drive roller and pinch roller.

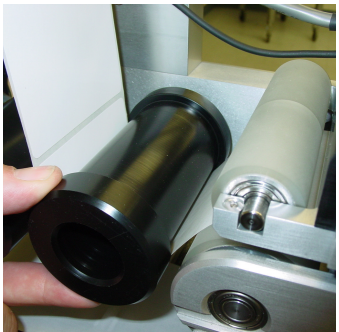


2) You can either select the “Blade Extend” option on the applicator interface module or press the e-stop button or disconnect power and manually put the blade out by hand.

3) Remove the outer reel plate and slide the new roll of material onto the payoff hub with the labels face up.

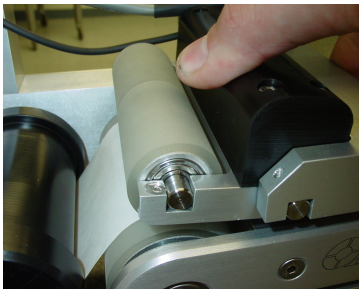
4) Make sure the inner reel plate is set to the correct offset distance according to the setup specs sheet.

5) Replace the outer reel plate.



6) Refer to the threading diagram in the back of your manual for your job specific threading for the black idler rollers. Most systems have only one roller in the right hand position only. Thread the carrier liner underneath the right-hand side idler roller. If the material does not come from below the idler roller the main tension roller might not grip the carrier liner correctly and slip and can cause feed and tracking issues.

Some material has to feed straight into the tension roller because the components can release from the liner and stick to the slip rollers.



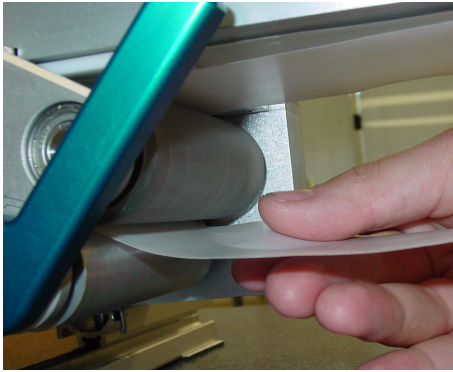
7) Thread the carrier tape over the tension roller while holding up the spring bar for the slip rollers, slightly lift up the encoder wheel and slide the material underneath it.

If you do not want to lift the top guard door, advance the material on the outside of the machine and slide it underneath the guard and into the blade pad guides.

8) Feed the material underneath the part sensor head and out the front of the applicator with at least 1.8 meters extra of carrier liner. Make sure to peel off any labels that are on the carrier liner before threading through the rollers underneath the blade. Snap the material into the blade pad tru-track guides so it is totally flat.



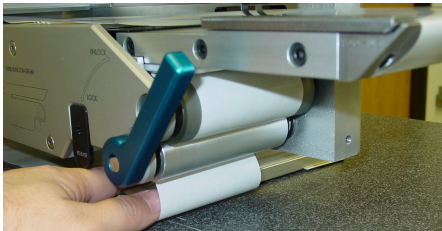
9) Thread the carrier liner on top of the white delrin guide until it comes out through the blade return roller on top of the urethane drive roller below. It is necessary for the liner to have a nice clean flat edge to feed it in and out of this roller. If not it will be very difficult to get the liner to come back out of the return roller guide. You can also cut the liner at a slight angled or push the liner through at an angle for easier threading for this roller.



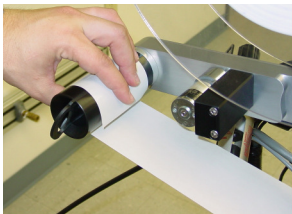
10) Thread the carrier liner through the drive and pinch roller with the pinch lever unlocked. It is necessary for the liner to have a nice clean flat edge to feed it in and down out of this roller. If not it will be very difficult to get the liner come out the bottom. You can also cut the liner at a slight angled or push the liner through at an angle for easier threading for this roller.



11) Pull the carrier tape from below the pinch roller with the pinch lever unlocked.



12) Pull the carrier liner to the back of the machine to wrap around the take up roller while making sure the liner is centered on the drive roller.



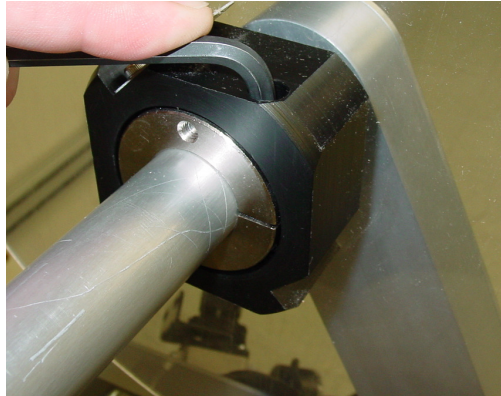
13) Pull the take up key out and wrap the carrier liner around the roller in the clockwise direction two times and then push in the key while making sure the liner is centered.

14) Pull the material forward until the first label is about 150mm to the left of the part material sensor head.

- 14) Once the material is aligned correctly and centered through all the guides and rollers (refer to the setup spec sheet for offset distance) and the material is tightly wrapped around the take up roller, close the pinch lever, and hit the "Exit Button" to exit the extend blade mode screen. The blade will retract and turn the take up motor off if it was left on.
- 15) Check again to make sure the material is snapped into the blade pad.
- 16) Hit the F3 button on the Applicator Interface Module to put the applicator in run mode.

k) Adjusting the Internal Hub Reel Assembly

The internal **Hub Reel Assembly** must be positioned correctly to maximize proper tracking of the carrier tape. Unlock the hub clamps and adjust the reels as shown to the tape's inner dimension. The inner dimension can be obtained by referring to the machine setup specs page or by measuring the tape's inner edge at the blade. This is done when the tape is centered on the blade. Best carrier tracking is achieved when the carrier tape is aligned with all of the roller and blade components.



To adjust the inner reel plate, place an allen wrench into the 3-inch hub or from an angle on the 6-inch hub and loosen the socket head screw and move the hub so the inner surface of the reel is at the offset distance according to the setup spec sheet for the specific material liner width used.

1) Material Sensor Setup

The Placer™ is equipped with an optical sensor that is suitable for most applications. This applicator has been designed with special software and hardware to handle all sorts of part geometry configurations including single and multiple part detection, and carrier tape notch sensing for hard to sense applications.

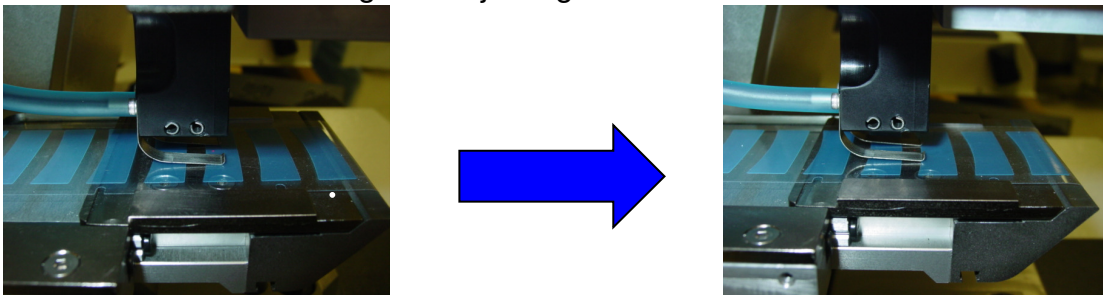
Note: If your system was set up by the factory then the sensor has already been adjusted for use with your component. If this is the case, you may skip this step.

In order to insure consistent operation, the optical sensor needs to be properly adjusted. The sensor must be adjusted both positionally (along the Sensor Mount Plate) and optically (on the amplifier itself).

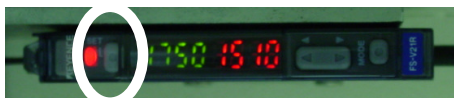
To adjust the sensor positionally, loosen up the small 2mm cap screw on the sensor head and move it to the desired location and tighten down the cap screw. Try to locate features on your part that will remain consistent as it passes under the sensor beam. Sensing the leading edge of a part is not optimal when the edge of the part is extremely close to the sensor eye on the next part since the material sensor has to detect that critical edge so early in the part movement cycle. If the material sensor does not detect that leading edge right away then your part could be over fed on the next placement. Ripples or thicker areas on your part may sometimes prematurely trip the sensor and cause the machine to malfunction. Also, try to find leading and trailing edges of your part that are perpendicular to the direction the tape is traveling. This will help the sensor find the edges of the part with the least opportunity for positional error. Make sure to use the material sensor spring finger as often as possible to keep the material flat and level when sensing. When a soft part needs to be detected, removing the material sensor spring finger could prevent the finger from pulling or stretching the part when sensing.

Adjusting the sensor optically.

To adjust the sensor optically, follow the instructions below for two-point calibration. This is the method we recommend for gross adjusting the sensor.



- Using blade extend mode set the blade slide to be extended out about 25mm past the part sensor and position the actual component or notch under the sensor while keeping it totally flat and tight press the “Set” button once.
- Position the carrier liner under the sensor and press the “Set” button again while being flat.
- The sensor calculates the mean of the two-recorded values and uses the result as the “trigger value”. This is the value at which the sensor will turn on/off. If the amplifier does not display a new set value then either the difference is not sufficient or you need to change the mode setting on the amplifier. If the part has a lower numerical value than the carrier tape set the amplifier to **D-ON** if it has a higher numerical value set the amplifier to **L-ON**.
- If you would like to fine-tune your sensor, use the “▲” and “▼” buttons to adjust the “trigger value”.



Set Button

m) Material Sensor Operation

Typically when the applicator does not correctly feed parts the sensor will need to be checked.

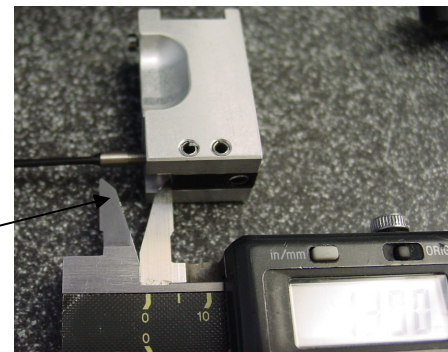
This applicator uses a LED fiber optical sensor or a laser sensor to detect the parts as they pass under the sensor head. The most common sensing head is a vertical sensor that produces a small beam spot pointing straight down. Other setups include angled sensor heads and through beam. The sensor amplifier contains the light source and the dual display that will indicate the sensor's trigger value (number which the output will turn on or off) and the current light intensity reflected. The coaxial fiber has a send (output) and a receive (input) fiber. The send fiber is a solid core fiber with a light gray dash on it. The receive fiber is a multi-core fiber that will plug into a plastic holder before being inserted in the amplifier. You can look at the end of the fiber to determine which fiber is the send or receive if the gray dash is not visible. Once both fibers are inserted into the small holder and the tips are flush to the end, correctly insert the solid fiber and multi-core fiber into the correct location according to the arrows on the amplifier.

Every label that is fed out for pickup is detected using the sensor. If setup correctly the applicator will also be able to skip missing parts and the distance between the parts are not critical. Having a small focused beam spot with the optics clean will insure a reliable and consistent part feed. Also, if the sensing is inconsistent check for proper sensor eye focus (distance between the sensor fiber metal end and the optical lens) and make sure the locknut is securely tightened. If the fiber is loosened out of the optical lens, the beam spot will typically get smaller and the reflected light will decrease. If the fiber is tightened into the optical lens then the beam spot will typically increase and the reflected light will increase. Check the applicator setup specs sheet for sensor fiber proper focal length.

If the material sensor is setup correctly the red output light on the sensor amplifier will be ON when the sensor head is detecting the part and OFF when it is not on a part. You will need to make sure the sensor head is mounted in the correct location and is mounted firmly on the sensor bar. If it has been bumped or moved the pickup length setting might need to be increased or decreased if the sensor is not mounted correctly. Some parts may have printed areas or voids that might cause unwanted changes in the reflection readings. Typically the sensor head will be located away from these areas on the part or liner that have inconsistent readings or the applicator will need to have a skip length setting used to skip over the false trigger areas.

Part= Output light ON
 No Part= Output light OFF
 Solid Core Fiber= Send (output light)
 Multi-core Fiber= Receive
 Typical focal length= 13mm

Checking
the sensor
head focal
length



n) Material Detection Setup (Sample)

LEADING EDGE DETECTION (on trigger) D-ON MODE

Detecting leading edge of part

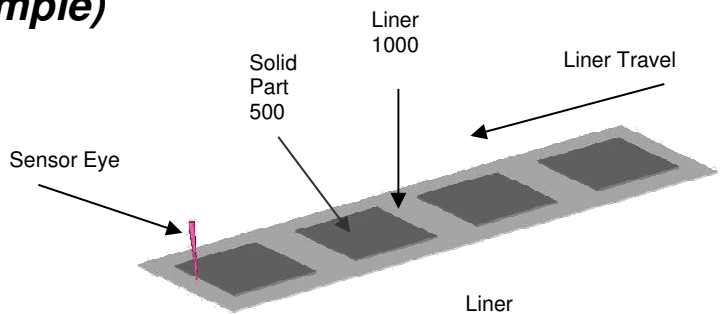
Raising trigger value=More sensitive

Lowering trigger value=Less sensitive

Black Part=500

White Liner=1000

Sensor amplifier trigger value=~750



LEADING EDGE DETECTION (on trigger) L-ON MODE

Detecting leading edge of part

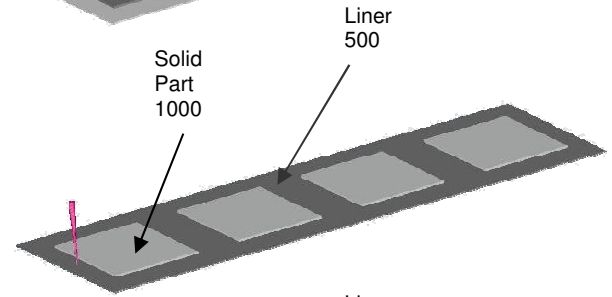
Raising trigger value=Less sensitive

Lowering trigger value=More sensitive

White Part=1000

Black Liner=500

Sensor amplifier trigger value=~750



TRAILING EDGE DETECTION (off trigger)-L-ON MODE

Detecting trailing edge of part (when parts are less than 8mm apart)

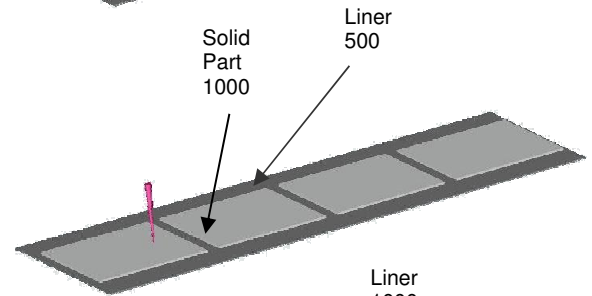
Raising trigger value=More sensitive

Lowering trigger value=Less sensitive

White Part=1000

Black Liner=500

Sensor amplifier trigger value=~750



TRAILING EDGE DETECTION (off trigger)-D-ON MODE

Detecting trailing edge of part (when parts are less than 8mm apart)

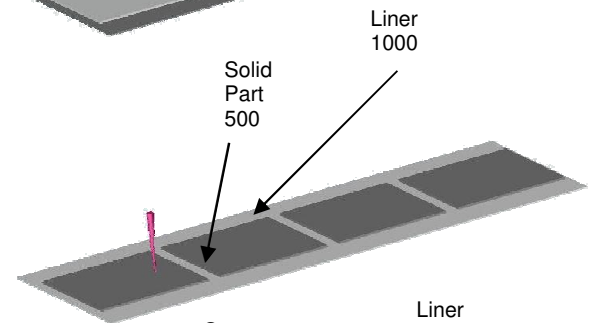
Raising trigger value=Less sensitive

Lowering trigger value=More sensitive

Black Part=500

White Liner=1000

Sensor amplifier trigger value=~750



LEADING EDGE DETECTION (on trigger)-L-ON MODE with skip length

Part sensing (Triggers an output when on the Part).

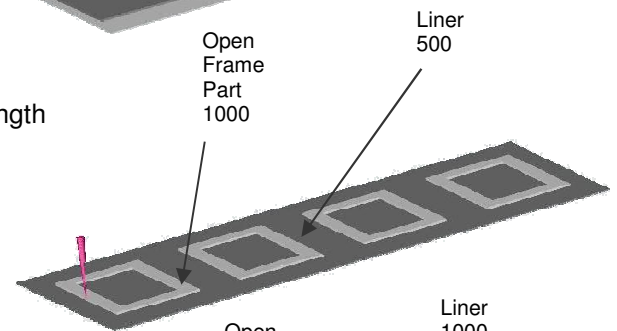
Raising trigger value=Less sensitive

Lowering trigger value=More sensitive

White Part=1000

Black Liner=500

Sensor amplifier trigger value=~750



LEADING EDGE DETECTION (on trigger)-D-ON MODE with skip length

Part sensing (Triggers an output when on the Part).

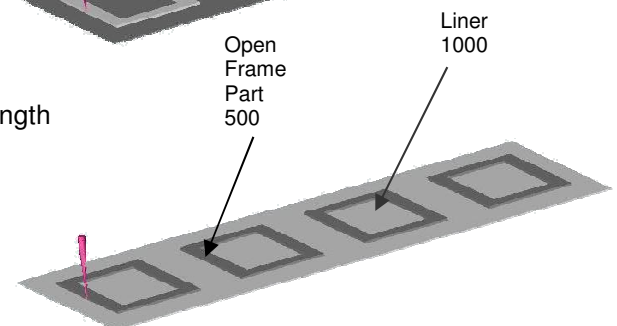
Raising trigger value=More sensitive

Lowering trigger value=Less sensitive

Black Part=500

White Liner=1000

Sensor amplifier trigger value=~750



6) Interfacing with Your Placer™

a) Applicator Interface Module™

Available keys are F1-F4, 0-9, EXIT and ENTER. Pressing EXIT exits the current menu / value display.

Main Screen

Nautilus Systems, Inc. Model#/Serial#	
Total Count	
"F1 Runtime"	F3 Enter Run Mode
F2 Stats	F4 Setup Mode

When the Main Screen is displayed, pressing F3 will place the applicator in 'Run Mode.' Once the applicator is in run mode an "F1 Runtime" option will appear on the screen. This will enable the operator to use special features like single cycling. Pressing F3 again will exit 'Run Mode.' Pressing F4 will enter the Setup Mode



Setup Mode Screens & Menu Tree

The first Setup Screen is a menu of options (shown below). The first two items (F1 & F2) allow operational variables to be changed.

Time & Speed Setup	(F1)
Distance & Mat'l Sense Setup	(F2)
Extend Blade	(F3)
Enter Auth Code	(F4)

5-Toggle Take Up	Enter-Toggle PU
1-Mat'l Rvs	3-Bld Ret
7-Mat'l Fwd	9 Bld Ext
8 Tgl Ext. I/O Enc/Bld	BH_ MS_

Enter Authorization Code:

If you are required to enter an 'Authorization Code' you would enter it here as the password.

1-Dwell Time	5-Bld Mv Params
2-Puff Off Time*	6-Bld Ret Speed
3-Seek Speed	7-Accel Rate
4-High Speed	8-Mtl Mv Params

1-Pickup Length	5-Matl Snr Setup
2-Skip Length	6-VacErr Retries
3-Bld Ext Length*	7-Clr Snr Bld
4-Tension Length	8-More Options

Press 1-8 to show the 'Set Variable' Screens:

Current Seek Speed = ####
Set New Value and Press Enter
(Valid Values ### through ###)
- F1 to confirm entry

The above box is typical of all variables. The name of the variable is displayed, then the existing value. Use the numeric keys to set a new value, then press the ENTER key. Press F1 to confirm the new value or EXIT to cancel.

*Variables with asterisk are sometimes not Used.

If you are using a Secure A.I.M. and 3,6,9, Enter buttons do not work, the handheld is not broken but you will have to insert the Nautilus supplied secure card to restore the use of those buttons.

Always remove the secure card from the handheld when you are not changing any parameters.

Press Exit when you are finished viewing / changing the value. You will be returned to the variable menu previously selected. Some of the variable screens valid values will change as other variable value settings are changed to limit incorrect settings stored.

Caution do not allow the A.I.M. handheld to be dropped or impacted with other objects or damage may result.

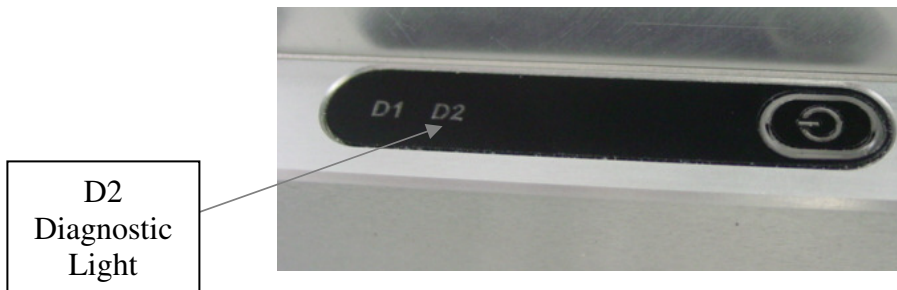
b) Applicator Interface Module™(continued)

The system does not require the AIM (Applicator Interface Module) to be plugged into the back of the applicator to cycle. If the AIM has been disconnected the D2 diagnostic light on top of the controller will continue to blink until it detects the AIM has been plugged back into the applicator. Always leave the thumb screws securely tightened on the D.B 9 AIM connector when plugged in the system. When the AIM is plugged back into the system the screen backlight should immediately turn light up on the screen and should be refreshed with data within 30 seconds.

The settings of the system can be checked while the system is cycling. If a setting is changed during cycling then the new setting will be applied to the next cycle. While the system is cycling it will leave the current text on the screen as long as there are no error messages shown. Some settings or options are not available while in run mode. If you need to enter those menus, press exit to the home screen and press the F3 button to take the applicator out of run mode. Any major setting changes that need to be made should only be attempted to be performed while the applicator is not in run mode!

The AIM device is strictly a 5vdc device and connecting anything other than 5vdc or inverse polarity will permanently damage the AIM.

It is not recommended to continually disconnect and connect the AIM while power is on.



D2 Diagnostic Light

Communication port indicator. If the AIM has been disconnected it will blink continuously. The system will continue to cycle and function but there will be no error messages and you will not be able to put the system in or out of run mode using the AIM.

c) Setting System Variables

Run Mode	Cycles the applicator in and out of run mode
Setup Mode	Menu to change applicator settings
Total Count:	Displays applicator total cycles
Extend Blade	Extends peel blade out for technician to load material or to calibrate sensor
5-Toggle Take Up	Using #5 button will turn on and off the Take Up Motor
Enter-Toggle PU	Using enter button will turn on and off the pickup valve
1-Mat'l Rvs	Moves the material reverse
7-Mat'l Fwd	Moves the material forward
6-Bld Ret	Will step the blade in
9-Bld Ext	Will step the blade out
8-Toggle Ext. I/O	Will turn on/off the External I/O Outputs (Error Out, Clear Out, Ready Out)
ENC/DRV	Displays the motion/encoder value as the material is stepped
BLD	Displays the blade distance value as the blade is stepped
BH	Displays the output condition of the Blade Home Input (1=ON)
MS	Displays the output condition of the Material Sensor (1=ON)
Dwell Time	Controls how long the tamp stays extended for placement after the tamp extended pressure sensor turns on
Puff Time	Controls how long the Puff Valve will stay on after the tamp extended pressure sensor turns on and the dwell time has expired
Seek Speed	Controls how fast the material and blade is being moved during part seek operation
High Speed	Controls how fast the material moves during skip and pickup
Blade Retract Speed	Controls how fast the blade retracts
Acceleration Rate	Controls how fast the applicator accelerates the speed variables (the higher the value the faster is accelerates)
Pickup Length	Controls the distance of the applied part out to the vacuum chuck after the critical part edge is found (x.01mm)
Skip Length	Controls how far the material moves blindly after the first edge of the part or notch is found in millimeters
Blade Extend Length*	Controls how far out the blade will extend (component dependent) (x.1mm)
Tension Length	Controls how much material is tensioned during blade peel back (x.1mm)
DeTension Length	Controls how much material is detensioned once the material has been fed out for pickup (x.1mm) Helps with material drift.
Material Sensor Setup	Controls if the applicator senses the Leading Edge, Trailing Edge or a liner notch, always set the material sensor amplifier to be on when on a part
Vacuum Error Retries	Controls how many times the applicator retries to get a part when no part is sensed by the vacuum sensor during pickup
Clear Sensor Blade	Clear Blade Edge: It enables the blade to move out about 5mm before part seek operation begins (prevents false triggers) Don't Clear Blade Edge: It starts the blade and material at the same time Pre Extend Blade: It extends the blade according to the blade extend length setting before part seek operation
More Options	
Encoded Move	Will use an optional material encoder for higher accuracy
Smooth Move	Will change the material move parameters to start at a much slower speed and change the acceleration rate by a rate of 10:1
Dwell Vacuum	It allows the tamp vacuum generator to stay on during part placement
Pre Skip Length	Allows the material to be advanced blindly a certain distance before initial part or notch seek operation. Will also advance the material before the blade starts to move (pre-peel operation) (x.1mm)

d) Setting System Variables (continued)

Enter Authorization Code	Is for entering an authorization code to enable the applicator to continue running, and to adjust some high level settings
Robot Mode	Is used to put the applicator in Robot Mode if the tamp is removed or is not controlled by the applicators controller
Tamp Mode	Is used to designate the tamp placement type
	<u>Packaging Mode</u> : Enables the tamp to extend with an acquired part and Wait for a start signal to puff the P.S.A. component. Caution be careful Before turning this setting on. If activated the tamp will automatically extend and could impact a person or moving fixture
	<u>Rotary Tamp Mode</u> : Is used when a rotary tamp module has been installed
	<u>Part Label Apply Mode</u> : Is used when the tamp needs to be loaded with a non tacky part into the head first and then the tamp will extend to place the part onto a double sided adhesive component
	<u>Tamp Hold Mode</u> : In this mode the tamp will stay extended as long as the start signal is left on. Once the start signal is released the tamp will retract
	<u>Starts Per Cycle</u> : Sets the start signal input requirement per cycle
Pre Peel Mode	If activated it causes the part to pre peel as the part and blade are moving out for pickup
Extended Blade Mode	Will allow a longer blade slide to extend to its full stroke if used
Blade Home Length	Controls how far the blade continues to retract once the home switch is detected (x.1mm)
Dropped Label Error	If turned on will stop the applicator and display dropped label error on the screen if the vacuum sensor has turned off when the start signal has been given after the part has been peeled
Vacuum Switch Stuck Error	If turned on will stop the applicator and display vacuum switch stuck on error on the screen if the vacuum sensor is already turned on when the vacuum generator is turned on before the tamp fully extends to the pickup position for peeling
Vacuum Persistence	Prevents the vacuum from turning off when the system e-stop loop is tripped. You must plumb the 6mm airline to the vacuum pump around the main air solenoid to use this functionality.

*Variables with asterisk are sometimes not used.

If you are using a Secure A.I.M. and 3,6,9, Enter buttons do not work, the handheld is not broken but you will have to insert the Nautilus supplied secure card to restore the use of those buttons. Remove the Secure Card when you are not changing any parameters.

e) Understanding Part Feed Sequence

Part Feed Sequence:

1. Sensor Eye Starting Position

Beginning Part Feed Position: When the applicator is first put into run mode and the blade starts to extend this is the starting position of the sensor eye on top of the liner. If clear sensor blade is activated the blade will start to move out first before the program looks at the material sensor state. Clear sensor blade setting or pre-skip length is normally used so there is less of a chance of a false trigger. This starting position is critical because the sensor must see the first edge of the part almost the same as the 2nd part feed position is. If not the label could be skipped over completely or the leading edge could be missed and the machine could fault. The best place to start the first part is before (left of the sensor) eye at least 20mm. Make sure to have the liner completely straight and flat in its tracks and the liner aligned through all the rollers.

Second Part Feed Position: Once the blade starts to extend, this is the starting position of the sensor eye on top of the liner after the first part has been fed onto the vacuum chuck. This starting position is also important because if the sensor eye is already on the next part you must switch to trailing edge detection mode or lower the pickup length. If trailing edge detection is not possible you will need to add a skip length in and sense another edge on you part.

2. Pre-Skip Move

If the setting is greater than 0 the applicator will skip from the starting position to a specific location without looking at the sensor output state. Pre-skip is used to skip the material forward to a location that will be consistent for sensing. For example, when the applicator start position (sensor eye location) is directly above the edge of the part you will probably need to use a small pre-skip. For example, if the pre-skip length is set to 20, the pre-skip length will be 2mm.

3. Find Part Move (Part Seek Operation)

Leading Edge Detection (on trigger): After the pre-skip move the applicator will seek for the sensor output light to turn on. If the sensor light is on right away the machine will stop and display an error. If the sensor is not consistently seeing the leading edge because the sensor is too close to the leading edge when it starts after the start position you will need to lower the pre-skip move, pickup length, or switch to trailing edge detection mode.

Trailing Edge Detection (off trigger): After the pre-skip move the applicator will seek for the sensor output light to turn on and then off. If there is a skip length move it will be performed after the sensor output light turns on.

Notch Sense Detection (on trigger): After the pre-skip move the applicator will seek for the sensor output light to turn on. If the sensor light is on right away the machine will stop and display an error. If the sensor is not consistently seeing the leading edge of the notch because the sensor is too close to the leading edge of the notch when it starts after

the start position you will need to lower the pre-skip move, pickup length, or switch to trailing edge detection mode.

4. **Skip Length Move**

If the setting is greater than 0 the applicator will skip from the find part move to a specific location without looking at the sensor output state. If the skip length is too long the material will be over-fed and the applicator will stop because the sensor light will already be off and would probably mis-feed the part. Make sure to set the skip length high enough to skip over any unwanted reflection changes in the part to prevent sensor false triggers. For example, if the skip length is set to 20, the skip length will be 2mm.

5. **2nd Find Part Move (2nd Part Seek Operation) might not be used**

If using any find part move with a skip length this move will be the seek operation that finds the trailing edge (off trigger), leading edge (on trigger), or notch sense (on trigger) of the part. During this move the applicator will seek until the sensor output light turns on or off unless a time out is achieved.

6. **Pickup Length Move**

Single Part Move: Is when only one part is being fed out to the vacuum chuck. This move is set in .01 millimeters, and each value of 1 is .01mm in length the material would be moved.

Multiple Part Move: Is when more than one part is being fed out to the vacuum chuck. It is recommended for better accuracy to sense the last part in a multiple feed move. To increase the accuracy in a multiple part feed, you will need to lower the pickup length to move only one part out to the vacuum chuck and use skip length to skip over the middle parts and sense the last parts' leading or trailing edge depending on the skip length used. This move is set in .01 millimeters, and each value of 1 is .01mm in length the material would be moved.

Errors:

Short Feed Is when the applicator feeds the part to short because either the sensor turned ON to early or OFF to early (L ON or D ON).

Double Feed Is when the applicator sensor does not turn OFF or ON when the edge of the part passes underneath the sensor and the part is overfed or two parts have been fed.

Note:

On Trigger: Is when the applicator seeks for the sensor light to turn on.

Off Trigger: Is when the applicator seeks for the sensor light to turn off.

Sensor Eye: Is the red beam spot that is focused on the liner and parts to detect a reflection change. The sensor can be set in D-on (dark on mode) or L-on (light on mode). Refer to the Material Sensor Setup page in this manual for more information.

f) External I/O (Inputs and Outputs) Wiring Details

PLACER-NSXR EXTERNAL I/O CONNECTOR (IN THE REAR OF THE APPLICATOR)

Pin #	Pin Name	Wire Color	Description
1	Start Signal Input*	ORG	Inputs: 24VDC or 0VDC signal. If 0VDC is used on Pin #5 (Input Common) then 24VDC applied to Pins 1-4 will activate the corresponding input. If 24 VDC is used on Pin #5 (Input Common) then 0VDC on the input pins will activate them. Start: to externally cycle the applicator once in run mode. Run Toggle: (Optional) Input to externally toggle the applicator in and out of Run Mode. (Same as F3 button on AIM) Air Pressure: (Optional) Input to monitor minimum air pressure. (When the signal is given the applicator will pause and show a Low Air Error message on the screen and the error output will be turned on). User: (Program Dependent) An input such as Low Material Sensor. The function of this input is available to be defined according to customer requirements.
2	Run Toggle Input*	GRN	
3	Air Pressure Input*	WHT	
4	User Input	RED	
5	Input Common	BLK	This is the Common for Input Pins 1-4. Connect to local 0VDC if using sourcing 24VDC outputs. Connect to local 24VDC if using sinking 0VDC outputs. Do not connect to chassis ground instead of 0VDC.
6	Not Used	--	Not Used
7	Ready Out**	GRN/BLK	+24V Output signals. Connect to sinking inputs of the control system (0V Common).
8	Clear Out**	WHT/BLK	Output Indications (refer to next page for more detail): Ready: First comes ON when the applicator has picked up a label to be applied. Clear: Is ON while the applicator tamp is fully retracted. Error: Is ON while the applicator has an active error. Running: Is ON while the applicator is in run mode.
9	Error Out**	BLU/BLK	
10	Running Out**	GRN/WHT	
11	Output 0 VDC	BLK/WHT	Connect to local 0VDC Do not connect to chassis ground instead of 0VDC (Works with Pin# 7-10)
12	Output 24 VDC	ORG/BLK	Connect to local 24VDC (Works with Pin# 7-10) This is the voltage that is output by the outputs (Ready, Clear, Error and Running outputs). Acceptable voltage range is 24vdc +/- 10%
13	AMP PWR RTN	RED/WHT	This is the Stepper Motor Amplifier Power Loop. Connect to AMP PWR OUT (Pin 14) to AMP PWR RTN (Pin 13) through a <u>Normally Closed</u> Emergency Stop / Safety Controller contact (must be rated at 24VDC, 5 Amps or more.)
14	AMP PWR OUT	RED/BLK	The Power to the Stepper Motor Amplifiers is interrupted by opening this circuit. A message of "E-Stop is Active" will be displayed on the AI when this Loop is open. Do not connect any external voltages to these pins.

* The external control systems' outputs need to have a load rating of 250mw or higher.

** The applicators outputs are sourcing transistors with a 12 watt maximum per output rating.

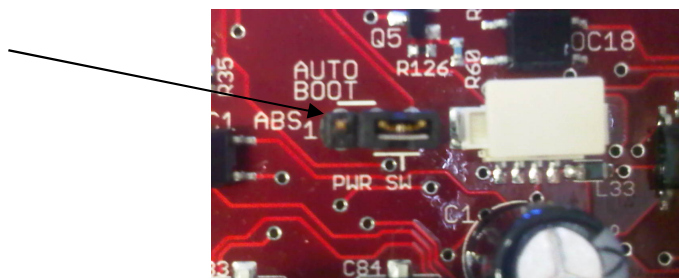
External Wiring Specifics:

An External I/O cable is included with all Placer series machines. If the Placer is installed by Nautilus Systems on a production platform base then the I/O connections will be complete. The cable is shielded and has 22 awg conductors.

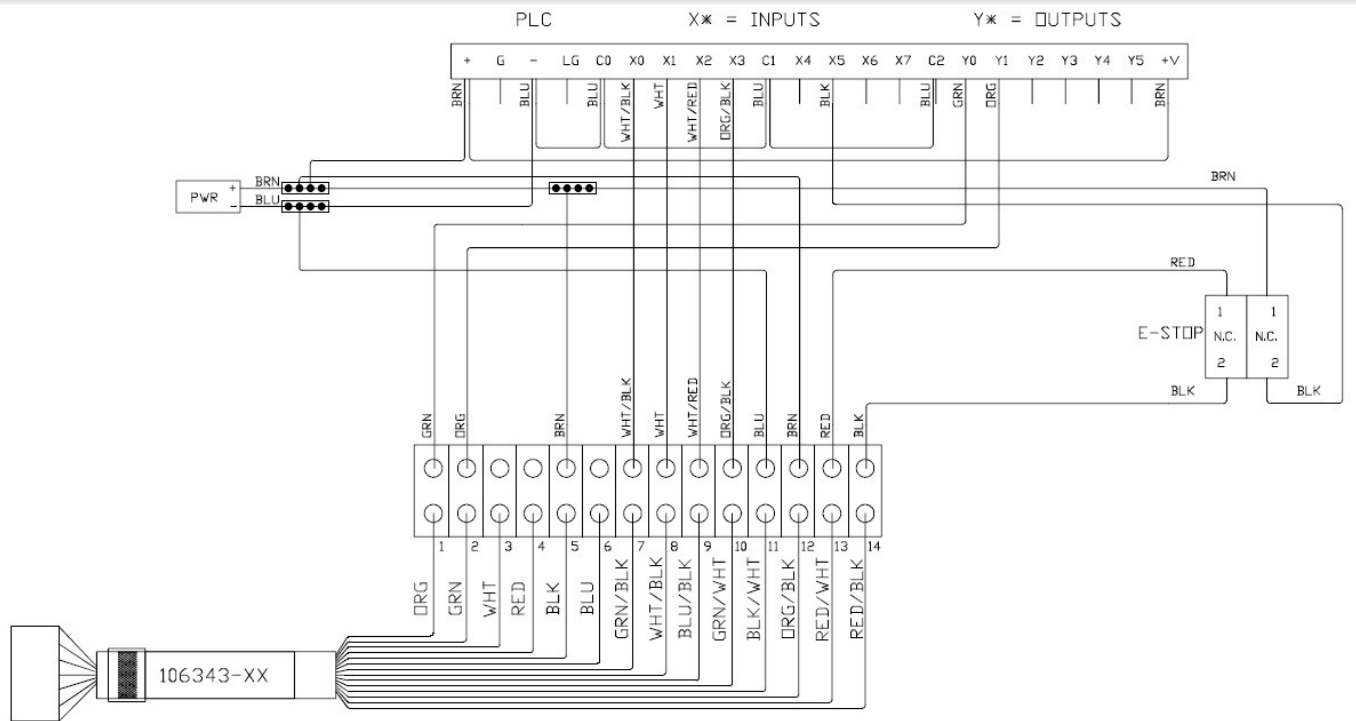
The NSI cable part # is 106343 - X (X is the length in feet).

Auto-boot

If the system will be mounted in a guarded automated system you can have the applicator auto-boot when power is returned to the system. All systems ship with auto-boot disabled. If you want the applicator to auto-boot, refer to the section "Applicator Controller" to remove the controller and move the jumper to the Auto-boot position.



g) Example Wiring Diagram



h) External Inputs and Outputs (Software)

External Control System Interface:

This applicator requires 24VDC or 0VDC digital input signals to operate and provides 24VDC signal outputs. The I/O indications and applicator cycle activation requirements are detailed here.

Applicator Outputs			Indication of Applicator Outputs to the Control System
Ready	Clear	Error	
ON/OFF	ON/OFF	ON	There is an active error that prevents the applicator from running.
ON	ON	OFF	<u>Ready/Clear State:</u> The Applicator is ready to place a part. Turn the Start Signal input ON (as long as “Ready” is ON) to cycle the applicator.
ON	OFF	OFF	<u>Busy State:</u> The Applicator is placing a part and the Tamp is NOT clear of the work area. (Note the second option of the OFF/ON/OFF state.)
OFF	OFF	OFF	<u>Busy State:</u> The Applicator has completed the part placement, but the Tamp is NOT clear of the work area. The Start Signal should be turned OFF whenever “Ready” is OFF. <i>This condition required for cycle completion.</i>
OFF	ON	OFF	There are two possible indications for this condition. <u>Clear State:</u> After receiving the Start Signal and placing the part, the Tamp has returned to the retracted position and is clear of the work area. This condition (following ALL signals OFF) indicates full completion of the cycle. A new cycle can begin when “Ready” turns ON. <u>Busy State:</u> The vacuum switch was OFF when the Start Signal was issued (there was no part or it did not stick to the chuck). In this case, the applicator will re-attempt picking a part. The Start Signal must be removed then reasserted to cycle the Applicator.

Inputs

Start Signal Input Is used to cycle the applicator once it is in run mode. The start signal needs to be sustained until the ready output turns off and then turned on after the ready signal turns back on. When the applicator is placed in run mode it will automatically capture and peel a part. The tamp will wait at the pickup position for the start signal then extend for component placement. If the vacuum switch input is not on, the applicator will either then reload a component and once captured wait at the pickup position for the start signal again or display an error message (dropped label error) and turn on the error output. If the start signal has been left on while being put into run mode the applicator will not cycle and will display start input latched error until the start signal input is turned off.

Note: When the control system is ready to cycle the applicator, the Start Signal should be turned ON whenever the “Ready Output” is ON (this will accomplish the Start re-assertion required if there was a part missing). Once all three outputs have turned OFF, the cycle should be reset. Once the “Clear Output” comes ON, the control system can perform other tasks (such as indexing a turntable) regardless of the “Ready Output” state.

Note: If the setting called Starts/Cycle is set to 2 then (2) Start Signal activations are required for EACH applicator cycle in this mode. One start signal is required to advance the part for pickup and peeling and the 2nd start signal input will place the part.

Air Pressure Input	(Optional) Input to stop the applicator when the air pressure is below a certain threshold. If the signal is turned on the applicator will display the error message (Low Air Pressure) and the error output will be turned on until the signal turns off. This input is a non critical error and <u>does not need</u> the F3 button to be pressed to be placed back into run mode.
User Input	(Optional) Input that is user selectable or customized on a case by case basis. If Low Material is selected as the user input the applicator will display Low Material on the AIM screen and the error output will be turned on and the applicator will stop cycling until the input is turned off. Running Output This output signal will indicate if the applicator is in or out of run mode. It will turn on when it is in run mode and will be off when it is out of run mode. If the applicator needs to be cycled it will need to be in run mode to accept the start signal. If the running output is not on then the run mode input needs to be toggled to put it in run mode. Once it is in run mode the, the run output will be turned on and will allow the applicator to be cycled. If the start signal has been left on while being put into run mode the applicator will not cycle and will display start input latched error until the start signal input is turned off.

Outputs

Ready Output	Is turned on once the applicator has picked up a part onto the vacuum chuck and is ready to be placed.
Clear Output	Is turned on once the applicators' tamp is at the pickup or retracted position.
Error Output	Is turned on once there is an applicator error and all motion is stopped. Some errors will clear themselves when they occur and satisfied and other errors are permanent and need to be cleared on the AIM or cleared using the run toggle input.

i) Remote Run Toggle

This model applicator has been upgraded with an external run toggle input. This function will allow the applicator to be externally placed into run mode and out of run mode. **Do not hook up this feature unless this machine is to be used to interface with other automation and not a human operator and is completely guarded. With this feature the applicator could start cycling at any time when it is not in extend blade mode or I/O test.** This feature is used through the External I/O port. It has two pins for the remote run toggle input to trigger the applicator to go into run mode and two pins for indicating if its is in or out of run mode. The output will be ON when it is in run mode.

For the external control system to trigger the applicator to enter run mode, wait until the clear output turns on and then trigger the remote run toggle input for at least 100ms and until the run mode output turns on. When the applicator boots up from powered down state, the clear output will be off until it fully boots up and the tamp is fully retracted. If the clear output does not turn on, the applicator has an error that needs to be fixed or is in a non run mode screen like extend blade mode. To trigger the applicator to exit run mode it is recommended to only trigger the input if the clear output is ON. Trigger the remote run toggle for at least 100ms and until the run mode output turns off. It is possible to trigger the applicator to exit run mode if only the ready output is on but there might be a label presented out on the blade and once the applicator leaves run mode it will retract the blade and a label might wrap itself around a roller or get jammed into the drive or blade mechanism. During certain operation sequences the applicator will not respond to the remote run toggle input especially when the ready and clear outputs are both off and the applicator is feeding the component.

Run Mode Input	(Optional) Input to externally place the applicator in or out of run mode (Same as F3 button on Applicator Interface Module). Toggle the input to place the applicator into run mode, then remove it. To take the applicator out of run mode toggle the input again and then remove it. If you leave the run mode input on then it is possible that the operator could not exit or enter run mode on the AIM. When the applicator is first turned on it will need to be put in run mode approximately 12-30seconds after start-up and the applicator will show the home screen. Then the applicator can be put in run mode and cycled. If a critical error happens while in run mode for example (material sense, move stop, or encoder error) the operator will then need to clear the error by pressing F3 to reset or toggle by the control system, then the run mode input can be toggled again to continue cycling. If the e-stop circuit has been tripped then it will need to be reset by releasing the switch or providing power to the EMO safety circuit Pin # 13, 14. Then the run mode input can be toggled to place the applicator back into run mode and to continue cycling.
Running Output	This output signal will indicate if the applicator is in or out of run mode. It will turn on when it is in run mode and will be off when it is out of run mode. If the applicator needs to be cycled it will need to be in run mode to accept the start signal. If the running output is not on then the run mode input needs to be toggled to put it in run mode. Once it is in run mode the, the run output will be turned on and will allow the applicator to be cycled. If the start signal has been left on while being put into run mode the applicator will not cycle and will display start input latched error until the start signal input is turned off.

7) Running the Applicator

a) Preparing to Place P.S.A. Components

Before putting the applicator into run mode check for proper electrical and pneumatic connections to be secure and safe from any moving parts of the applicator. Please refer to chapter 4 (Applicator Safety) before running this machine. Check for proper functionality of system e-stops and guard doors. Make sure the incoming air pressure matches the setup sheet air pressure specification.

Turn on the applicator and watch for any errors to appear on the Applicator Interface Module. If no errors appear, it will take about 25 seconds to start-up and display the run screen. Make sure the black part sensor head by the tamp is mounted securely to its mount block with the M2 socket head screw tight so the sensor head does not move during running. The first component to be placed should be about 20mm-150mm to the left of the sensor head. The carrier liner has to be correctly threaded through the applicator and snapped into the tru-trak™ blade pad.

b) Cycling the Applicator

Place a part into the fixture nest underneath the tamp. Press the F3 button on the Applicator Interface Module once. If the applicator you are running has a Secure Interface Module then you will need to insert the secure smart card into the bottom slot of the module to change settings or to manually cycle the applicator (if you have a secure interface module it will say "Secure" on the bezel around the interface screen). The applicator will extend the blade slide out and feed to the first component and attempt to pickup the component. If it captures the part correctly on the chuck place your hands in the two-hand anti tie down buttons simultaneously until the tamp extends all the way and places the component onto part in the fixture and then retracts you can remove your hands from the buttons. You have to remove your hands from the buttons between each cycle. If you remove your hands too early from the cycle buttons the tamp will retract and wait for the cycle buttons to be activated again. If the cycle buttons are held just long enough for the component to be placed onto the part, but not long enough for the tamp extended pressure sensor to turn on, the vacuum sensor will turn off and let the applicator know that during the next cycle input is turned on it will instead attempt to pickup a new part instead of placing an already placed component. If the two hand buttons are not available you can use the F1 runtime function once the applicator is in run mode. Each time you hit the 5 button the applicator will place one component.

Once the component is placed onto the part in the fixture, you will need to check the location of the component on the part. If the component placement is not correct, cycle the applicator about 10 times and make sure the component stack is consistent. If the stack is consistent make sure the component is aligned correctly on the vacuum chuck pad. If the component is aligned correctly on the vacuum chuck you will need to align the applicator with the part in the fixture, by either moving the fixture or moving the applicator. **Do not adjust the Pickup Length setting to correctly align the component on the part!** If the stack of labels are inconsistent to each other then refer to the troubleshooting chapter in the back of this manual. If the stack is good but the alignment on the chuck is not correct refer to the setup spec sheet for the proper pickup length or other settings. If the pickup length needs to be changed, the sensor head could have been bumped or moved and should be checked before any setting changes.

NOTE: Once the F3 button is pressed it will change the name of the function from Enter Run Mode to Exit Run Mode to identify what the next press of that button will perform!

If the applicator fails to remove the component from the carrier liner, refer to the setup specs sheet to make sure the settings are correctly set.

c) Adjusting the Vacuum Sensor Switch

The vacuum sensor is used to sense the component on the vacuum chuck.

The vacuum sensor is mounted directly to the vacuum generators vacuum port with a 100789 part # label on it.

When the machine turns on the vacuum generator, it will create vacuum to capture the part on the vacuum chuck. With the vacuum generator on, and when the part is correctly located on the vacuum chuck the output light (red light) will be illuminated. This output will tell the machine it has correctly acquired the part on the vacuum chuck. With the vacuum generator on, and if the part is not present or is not covering the vacuum holes on the vacuum chuck the sensor output light should be off.

For this vacuum sensor to function properly the incoming air pressure has to be consistent! If the pressure to the vacuum generator increases or decreases more than .05MPa (7psi) it can not correctly detect the component on the vacuum chuck. Always set the applicators main air regulator to be about .05MPa (7psi) lower than the lowest the incoming pressure will lower too, or raise the incoming air pressure in your factory. Whenever you adjust the machines incoming air pressure you will have to re-adjust the vacuum sensor.

Do not adjust the vacuum sensor unless the vacuum generator is on and the machine is set to the correct pressure setting.

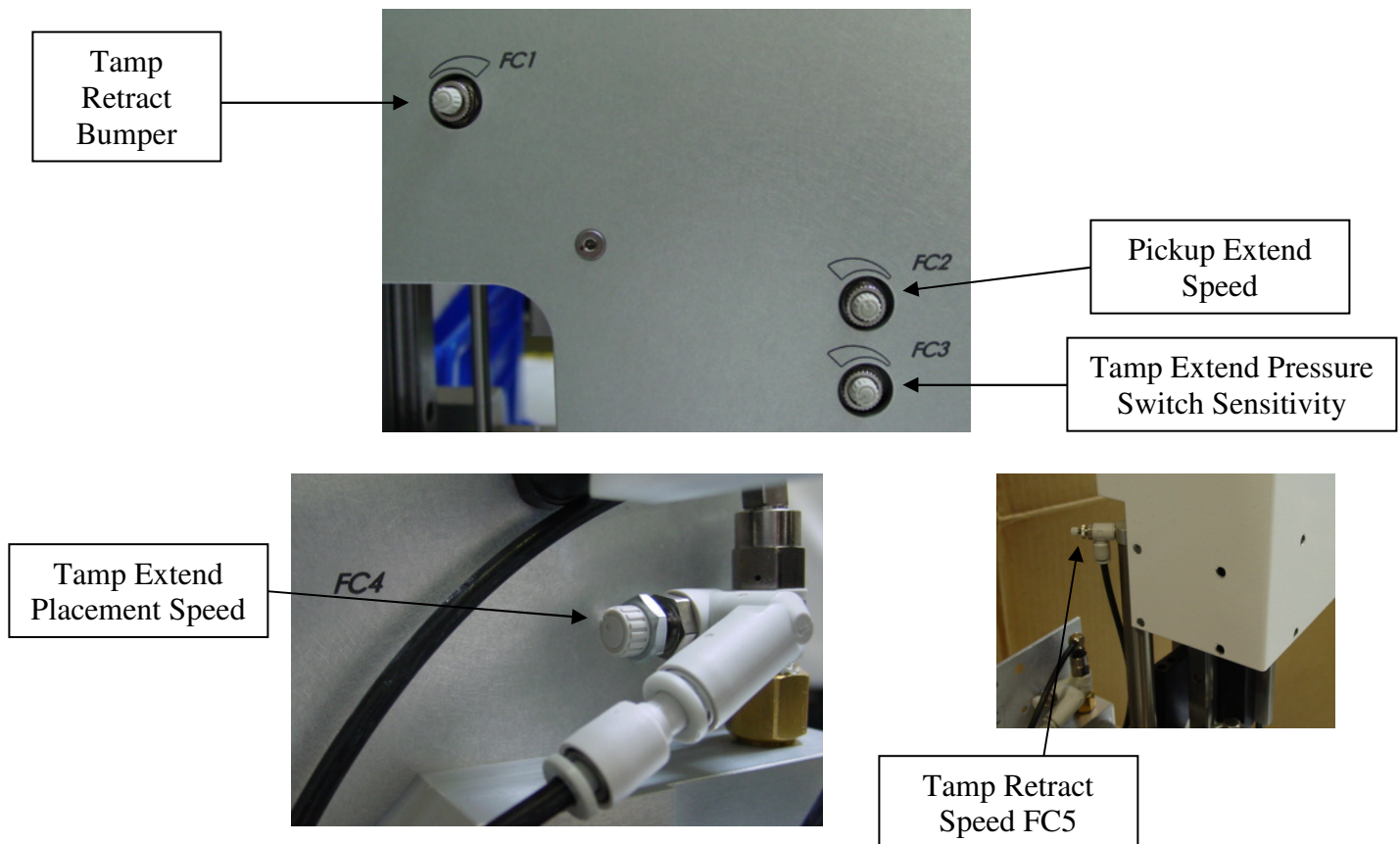
To adjust the sensor to be less sensitive turn the adjustment pot clockwise.

To adjust the sensor to be more sensitive turn the adjustment pot counter-clockwise.

d) Applicator Flow Controls

For the flow controls to function properly the incoming air pressure has to be consistent! If the pressure increases or decreases more than .07MPa (10psi) the flow controls might have to be adjusted. Always set the applicators main air regulator to be about .05MPa (7psi) lower than the lowest the incoming pressure will lower too, or raise the incoming air pressure in your factory.

Each flow control has its specific use. Do not adjust them unless you understand what they do. Just opening them all the way up will not make the system run better, but could cause errors or damage to the air cylinders or components on the system.



FC1: (Flow Control 1)

Controls the speed of the Tamp Retract Bumper. Increasing it (Clockwise) will slow down the Tamp at the Retract position.

FC2: (Flow Control 2)

Controls how fast the Tamp Will Extend to the Pickup position. Increasing it (Counter-clockwise) will cause the Tamp to move to the Pickup Position faster.

FC3: (Flow Control 3)

Controls the sensitivity of the Tamp Extend Pressure Sensor. Increasing it (Counter-Clockwise) will increase the sensitivity of the Tamp Extend Pressure Sensor.

FC4: (Flow Control 4)

Controls how fast the Tamp Extends for placement. Increasing it (Counter-Clockwise) will cause the Tamp to extend faster and the Tamp Extend Pressure Sensor to be less sensitive.

FC5: (Flow Control 5)

Controls how fast the Tamp will Retract. Increasing it (Counter-clockwise) will cause the Tamp to Retract faster. Some systems will not have and adjustable flow control here.

e) Adjusting the Tamp Extended Pressure Switch

The tamp extended pressure switch is used to detect when the tamp has extended for placement of the component.

The tamp extended pressure switch is located underneath the machines hood and is mounted to the chassis plate just to the left of the tamp. It has a 107033 part # on it.

For the machine to extend the tamp assembly it uses a pneumatic cylinder to fill with compressed air and force the tamp to the extended direction. When the tamp impacts an object, the pneumatic cylinder will stop allowing incoming air to enter it and will fill the whole pneumatic tamp extended circuit with the incoming air pressure. The tamp extended pressure switch will detect the rise in pressure because it is connected to the same circuit and will turn on according to its set pressure.

For this pressure switch to function properly the incoming air pressure has to be consistent! If the pressure increases or decreases more than .07MPa (10psi) it can not correctly detect the tamp extended contact pressure. Always set the applicators main air regulator to be about .05MPa (7psi) lower than the lowest the incoming pressure will lower too, or raise the incoming air pressure in your factory. Whenever you adjust the machines incoming air pressure you will have to re-adjust the tamp extended pressure switch.

To adjust the sensor to be less sensitive turn the adjustment pot clockwise (more pressure).

To adjust the sensor to be more sensitive turn the adjustment pot counter-clockwise (less pressure).

f) Adjusting the Material Tension Control

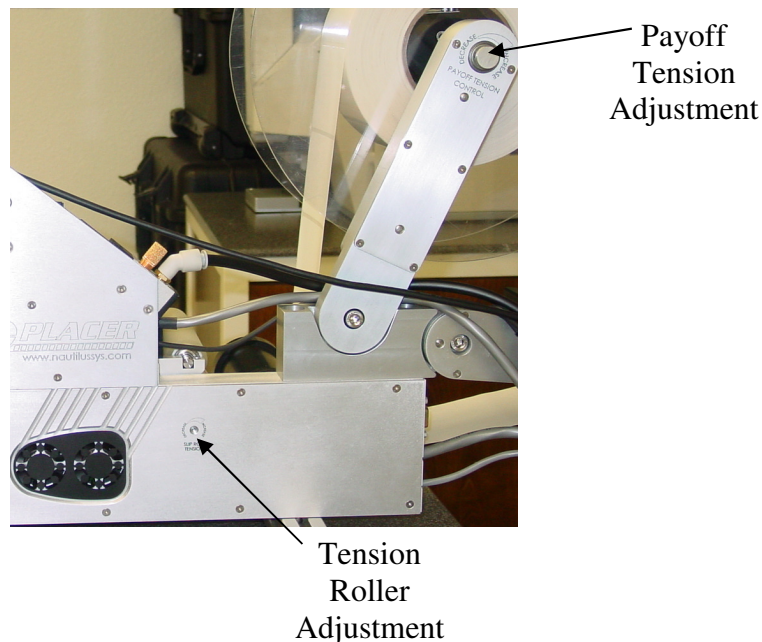
This applicator has two devices to control tension on the material as it feeds through the applicator.

The main purpose for these devices is to keep the material taught so an accurate feed will be possible and to keep the material properly tracking through the applicator.

The payoff tension control knob on the payoff arm and the tension roller adjustment positions are marked with instructions on increasing or decreasing the tension adjustment. Turning the adjustments clockwise will increase the tension on that roller and will increase the material tension. Typically these are adjusted at the factory for your setup and adjustment is not normally needed.

Payoff

To adjust or check for correct tension on the payoff tension control knob, load a full roll of parts onto the payoff hub and cycle the applicator and watch the material between the payoff roll and the black idler roller and make sure the material stays taught. If when the applicator cycles and pulls the material forward and the material becomes loose you will either need to increase the tension on the payoff or decrease the speed and acceleration settings on the applicator interface module. If you increase the tension too much on the payoff, the material might stretch considerably more and cause feed errors or create too much strain on the feed and blade mechanisms.



Perform this adjustment after correctly adjusting the payoff.

Tension Roller

To adjust or check for correct tension roller adjustment, cycle the applicator and watch the material at the blade edge and make sure the material stays tight around the blade edge during feed. If when the applicator cycles and pulls the material forward and the material becomes loose you will either need to increase the tension or decrease the speed and acceleration settings on the applicator interface module. If you increase the tension too much on the tension roller, the material might stretch considerably more and cause feed errors or create too much strain on the feed and blade mechanisms.

g) Encoder Module

The encoder module is included with applicator models with the EP (Extreme Precision Package). It also includes micro stepping drives that have the ability to run higher accuracy moves and fine tune adjustment of feed distances. The encoder option in the software can be deactivated or activated at any time. Selecting encoded option will allow the encoder to provide closed loop feed back to monitor the actual material movement during critical feeds. Selecting fixed pulse move will bypass the encoder and the high resolution drives will move to a fixed pulse move that will not be monitored by the encoder module.

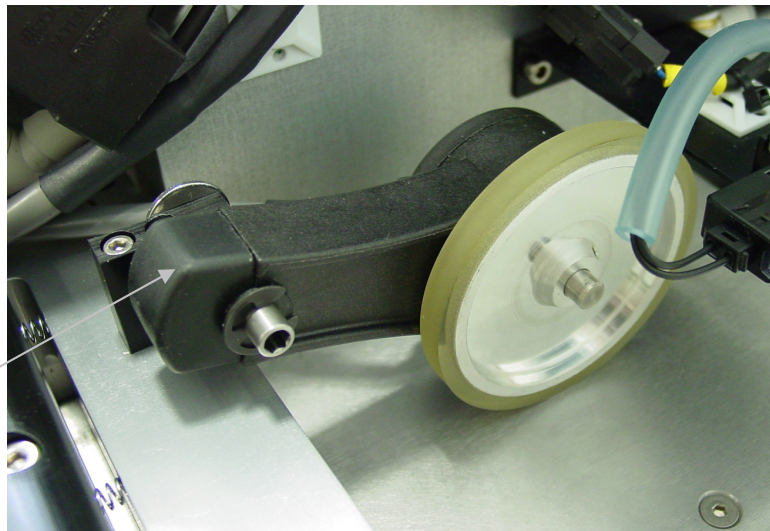
It is very important that the encoder wheel stays clean and has no debris on it.

Adjusting the encoder module.

The encoder module has a spring loaded arm mechanism that will force the encoder wheel to spin as the material passes underneath it. If the encoder has too much spring force it could cause tracking issues or binding issues and the encoder will not be able to provide an accurate detection of material movement. If the encoder arm is too light and is not pressing on the material hard enough it could slip and provide false detection of the material movement.

To adjust the encoder arm tension remove the black rubber cover on the left hand side of the encoder and place a 3/32-inch allen wrench in the end and slightly loosen the screw and slightly tilt up for more pressure and slightly down for less pressure and then securely tighten the screw down. Check the tension arm by slightly pulling up on the arm and feeling the pressure and once the desired tension is set replace the rubber cover and make sure the encoder module is perfectly inline with the material. If the screw is not securely tightened or the encoder is pulled up too far the spring lock block that the screw tightens into can slip and the encoder arm tension will need to be adjusted.

Tension control cover



h) Tamp Pickup Height Adjustment

The pickup height is set correctly at the factory. Each system is set using a standard gauge block that is approximately 22.12mm thick with no material on the blade. With the pickup valve on and the blade extended the block will just touch the blade peel edge. This will provide the most robust part peeling.

Each vacuum chuck block is designed with the gauge block height of 22.12mm as its final dimension once the vacuum pad and part and liner thickness is specified. The chuck block is then modified to accommodate the part and liner and vacuum pad thickness to achieve the correct pickup height. **Therefore pickup height adjustments should not be needed when switching from job to job.**

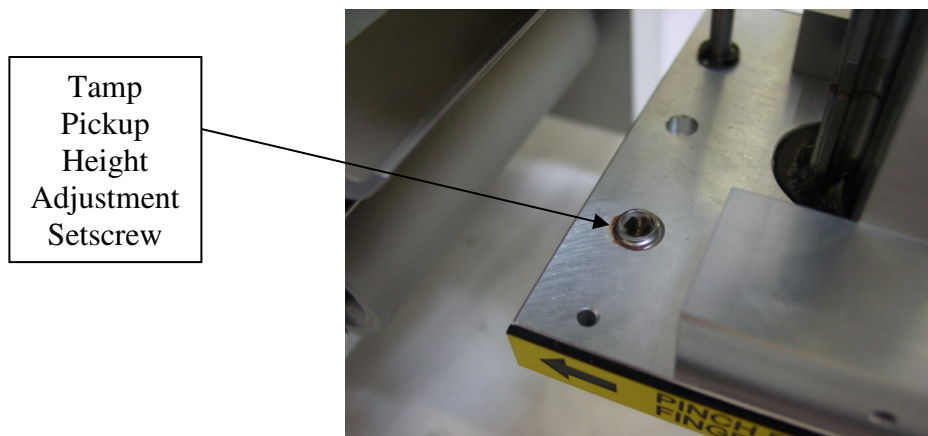
To check or adjust the pickup height adjustment you will need to use the Extend Blade Mode option on the Applicator Interface Module.

Once the blade is extended, use the # 3 button to retract the blade until the peel edge is just underneath the middle of the vacuum pad surface of the vacuum chuck. Then move the first part to be just hanging over the edge of the blade peel edge. Press the enter button to extend the pickup cylinder. Once the tamp has extended for pickup, pull down on the tamp to see if there is no space between the vacuum pad and the material. If there is not then retract the blade using the #3 button and see if the tamp extends farther at all after the blade has fully retracted. If it does not your pickup height is set correctly. If the tamp extends farther you might need to tighten (clockwise) the pickup height setscrew until it does not over compress the part. If there is a space between the vacuum chuck and part then you might need to loosen the pickup height setscrew (counter-clockwise) until it just touches the part.

Some jobs are setup that the part is slightly compressed and some the vacuum chuck will stop slightly above like dead soft parts like copper and aluminum. Contact NSI for specific pickup height adjustments if your system has trouble peeling your part.

If the pickup cylinder extends and you get the vacuum sensor input not on, then you might need to check the pickup height adjustment.

If the parts just feed over the blade edge and don't get peeled onto the vacuum chuck, then you might need to check the pickup height adjustment.

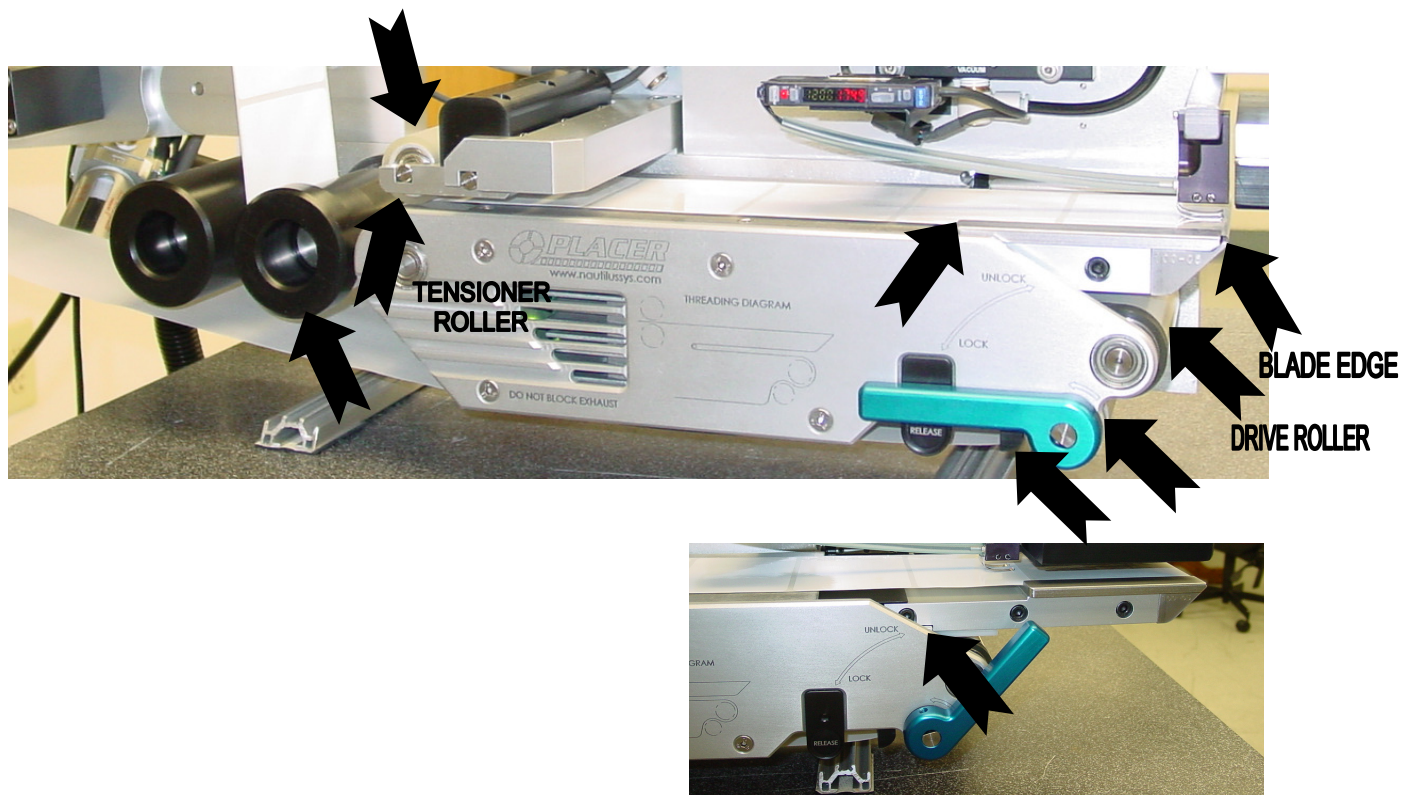


8) Caring for Your Placer™

a) Cleaning Your Machine's Rollers

After prolonged operation your machine's rollers may start showing a buildup of debris. It is recommended that you use a soft shop rag to wipe the rollers clean. Isopropyl Alcohol can be used indirectly on any of the rollers for stubborn debris.

***Note:** Do not use sharp objects to scrape debris from the rollers. Permanent damage may occur. If the urethane coating on either the **Drive Roller** or the **Tensioner Roller** becomes cut or damaged, they must be replaced.*

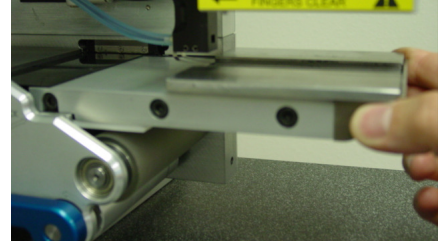


b) Cleaning Your Machine's Rollers (continued)

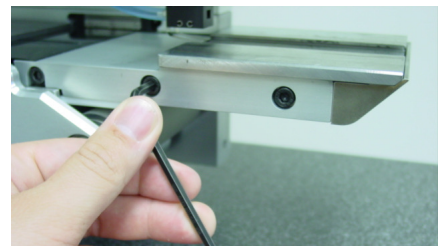
If an adhesive component has wrapped itself around the internal roller or feed guide on the blade slide you will have to remove the blade slide to remove the label from it.

Remove the material from the blade slide area on the machine.

Turn off the machine and extend the blade slide all the way out by hand.

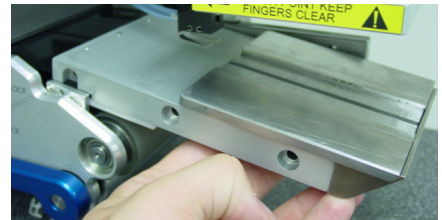


Unscrew all three socket head cap screws from the blade slide.



Slightly pull the blade slide toward you about 1mm.

Tilt the blade slide down on the right and slide it out to the right and carefully remove it from the machine.



Flip the blade slide over and remove the adhesive component from the roller or white feed guide if accessible.

You can also remove the roller assembly and feed guide to remove the adhesive component.



Reverse the procedure to install the blade while pushing the blade slide all the way to the left when tightening the mount screws.

Then lift up the blade finger guard and place it on top of the blade slide and locate its slot over the locate pin.

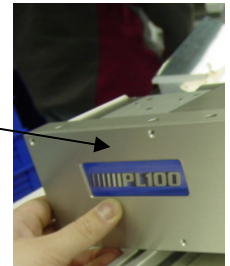


c) Lubricating Gears, Bushings and Bearings

Drive Gear Lubrication

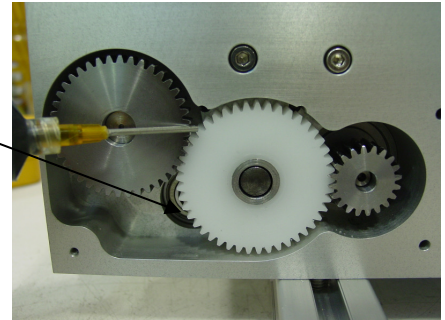
Service Interval: Every 600,000 cycles

Remove the rear cover plate by removing four 03x 08mm flat head cap screws.



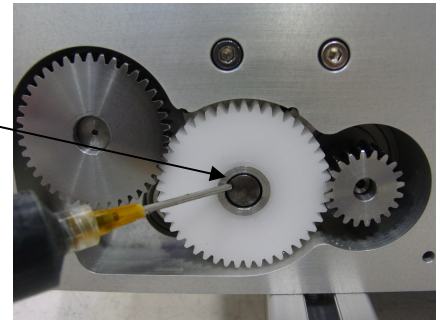
Apply Mobilgrease XHP 220,221,222 Lithium Grease (safe on nylon gears) to the outside of the white nylon idler gear.

NSI Part # 100937



Apply Mobilgrease XHP 220,221,222 Lithium Grease (safe on nylon gears) to the inside bushing on the white nylon idler gear.

NSI Part # 100937



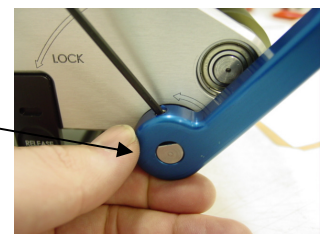
Keep the rear plate off for the next procedure.

Blade Bearing Rail and Rack Lubrication

Service Interval: Every 600,000 cycles

Unplug the power, AIM, and external i/o connection to the controller and disconnect all connectors plugged into the controller on top. Refer to the section "Applicator Controller" on how to remove the controller from the main chassis plate.

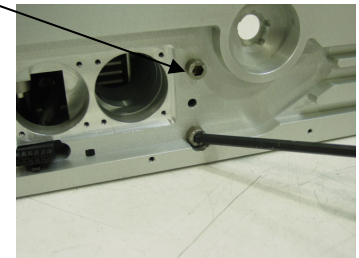
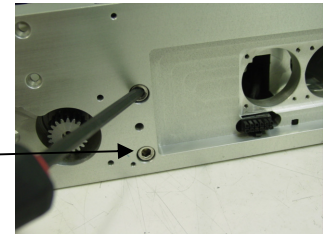
Remove the pinch release lever.



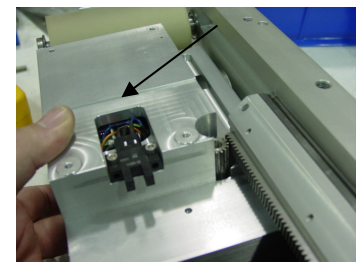
Remove the outer plate assembly.



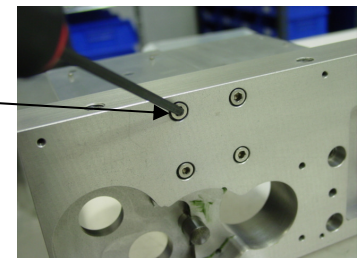
Unscrew the four 6mm socket head cap screws about $\frac{3}{4}$ the way out that mount the blade chassis to the main chassis.



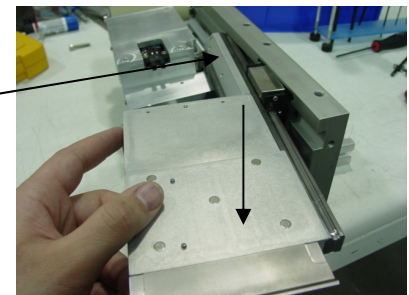
Partially pull out the blade chassis and tilt it down.



Unscrew the four 4mm socket head cap screws that mount the blade bearing to the main chassis.

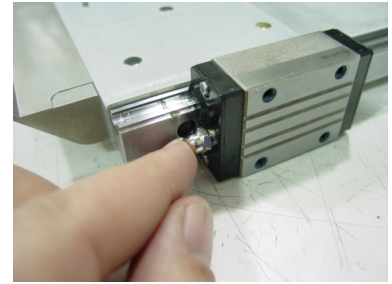


Carefully slide the blade assembly out while tilting it slightly to free up the blade stroke pin.



Using the installed grease fitting carefully inject Mobilith SHC 220 Lithium Soap Based Grease using a grease gun on the zerk fitting lubricate the carriage as you slide the bearing back and forth but not off the end of the rail.

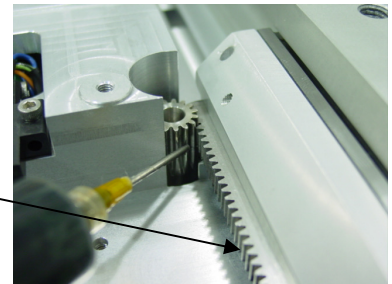
NSI Part # 100954



Carefully slide the blade assembly back into the chassis.

Using Mobilgrease XHP 220,221,222 Lithium Grease lubricate the blade drive rack.

NSI Part # 100937



Align the blade chassis back onto the main chassis and tighten its bolts.

Tighten all four screws that hold the blade assembly in while making sure it is level.

Install the outer plate and pinch release lever.

Replace the rear cover plate while making sure all three gears do not rub on the cover plate or the main chassis plate.

Check the controller filter element in the outside intake slots to be clean and dry. If it is dirty replace with part # 107017.

Refer to “Applicator Controller” section for correct controller installation procedures.

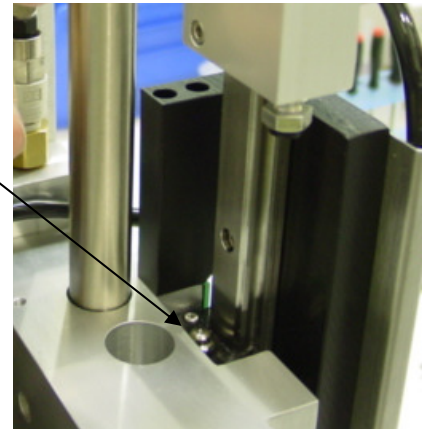
Tamp Bearing Rail Lubrication

Service Interval: Every 600,000 cycles

Remove all tamp covers.

Using the installed grease fitting on the top carefully inject Mobilith SHC 220 Lithium Soap Based Grease into the tamp bearing rail carriage and move the tamp up and down and inject some more.

NSI Part # 100954



Replace the tamp covers.

d) Air Filtration

It is recommended that the controller air filter be replaced occasionally. The frequency of this will vary depending on the environment that the system is operating in.

If the controller filter is dirty or wet replace it with a new one. **It is not designed to be cleaned.** Typically it starts as a light green color.

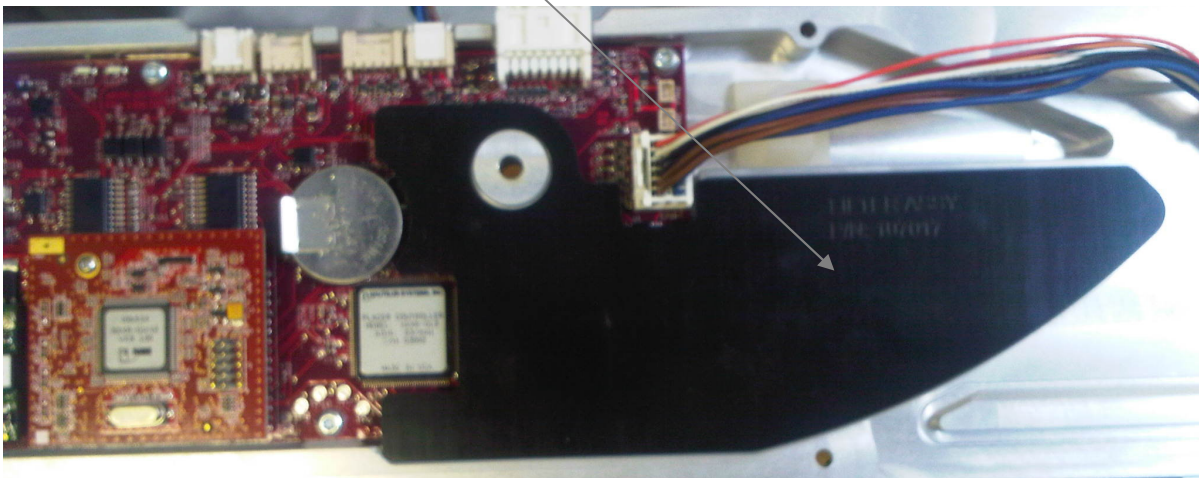
Avoid any contact with the control board as debris or static discharge can damage the board. Do not remove the core module!

Filter Replacement.

To remove the filter element, you must disconnect all power, AIM, and external i/o connection to the controller and disconnect all connectors plugged into the controller on top. Unscrew all four screws securing the controller. Carefully pull the controller housing straight out and tilt open the controller and disconnect the two fan connections and the one drive header. Pull the black cover off of the controller that is on the right hand side and clean the area out with an alcohol soaked rag. Replace the filter assy with a new one and put the controller back in the machine once it fully dries. Refer to applicator controller page for correct controller installation procedure.

Note: Do not use solvents, or harsh chemicals to clean the controller area. Permanent damage to the main control board will happen. Do not use oil in the filter element as internal damage can result.

Controller Filter Assy Part# 107017



e) Case and Panel Care

Clean the outer case with a shop towel and a gentle cleanser (isopropyl or denatured alcohol). Wipe the operator panel with a damp cloth to remove debris.

Note: Do not use solvents or harsh chemicals on the surface. Excess liquids on or around operator panel may cause a malfunction.

9) Troubleshooting

a) Troubleshooting Basics

When troubleshooting this system there is a simple flow to follow to get your applicator running again. Follow these steps to quickly return your system to full functionality. NSI can provide you with documents about your system. Typically they are emailed to you. A System Manual, Applicator Setup Specs Sheet, Recommended Threading Sheet, Part Sensor Location Sheet, Recommended Spare Sheet, and Schematics can be provided at no cost.

- 1) Do not adjust any settings or mechanical adjustments unless you fully understand its' use. Many times an issue is incorrectly diagnosed and something has been adjusted that causes a new issue and by the time the original issue is figured out you will have another issue to figure out also.
- 2) Check for correct material threading and payoff alignment. Refer to supplemental sheets in back of the manual for your specific threading. Pull back the material and retry.
- 3) Clean the system and remove all debris build-up.
- 4) Error Debug, document the error message. If the error appears on the screen refer to the hint on the screen or refer to the manual for correct fixes. If the error is not referred to in the manual, email the error message to NSI support for help with the issue.
- 5) Cycle power
- 6) Check for mechanical parts that have been bumped or loose. The sensor head location is documented on the Setup Specs Sheet.
- 7) Use the correct Applicator Setup Specs sheet to return all settings back to their original settings including the system air pressure. The sheets are kept in revision by their date at the top. The newer dates will be the most up to date. There will be a specific setup sheet for each program ran on each system.
- 8) If the error you are having is not referred to in the manual, contact NSI support for help with the issue. Make sure you have the error message, Job #, applicator serial #, ready when you contact NSI.

b) Conversational Diagnostics™

Whenever the program is waiting for a digital input condition a one second timer is started.

If the timer expires before the input condition is satisfied the program will begin displaying an **ERROR MESSAGE** on the Applicator Interface display screen.

When the input condition is satisfied the program sequence will continue.

When one or more errors occur the first error will appear until satisfied and shift to the next error unless e-stops is pressed and will overwrite any previous error until satisfied.

In the event of improper applicator function the error message will be displayed and will require a reset out of run mode. When the applicator is in run mode but not in the process of being cycled, some errors will not be shown until the applicator is sent a constant cycle signal. When the applicator attempts to cycle, it will then encounter the error and display it.

c) Symptoms and Solutions (Solutions in order of importance)

1. Component placement erratic

- a. Drive roller, encoder, applicator rollers not clean and free of debris
- b. Nest, part, applicator, or fixture loose
- c. Incorrect or inconsistent blade movement during feeding
- d. Material sensor not trained or aligned correctly
- e. Material not correctly tensioned by tensioner or payoff
- f. Component moving on vacuum chuck
- g. Material slipping on drive roller, encoder or tension roller
- h. Incorrect speed or distance settings stored
- i. Drive roller or blade return roller out of round
- j. Converted material not in correct specification. (stretching)
- k. Defective part sensor
- l. Guide rollers not lined up with blade top plate
- m. Tamp or blade guide rails worn out or needs adjustment

2. Material motor stalling or not moving

- a. Acceleration rate set to high
- b. Tension Length set to high
- c. Check motor alignment
- d. Check motor and amplifier wiring
- e. Bad drive bearings or gears behind rear cover plate need grease or servicing

3. Blade motor stalling or not moving

- a. Blade speeds set to high
- b. Acceleration rate set to high
- c. Tamp pickup distance or speed incorrectly set
- d. Blade bearing rails binding
- e. Tension Length set to high
- f. Check motor and amplifier wiring
- g. Check motor alignment

4. Applicator not acquiring parts from liner

- a. Material sensor not sensing components correctly
- b. Components not aligned properly on vacuum chuck
- c. Debris buildup on vacuum chuck
- d. Incorrect tamp pickup distance
- e. Worn out vacuum pad
- f. Incorrect tension length setting
- g. Incorrect peel back speed (blade retract speed setting)
- h. Incorrect blade extend distance or clear blade setting
- i. Converted material not in proper specifications
- j. Check Vacuum module for proper function and related parts

5. Carrier tape not tracking straight through applicator

- a. Applicator payoff hub reel assy and guide rollers not positioned correctly
- b. Debris build-up on rollers or related parts
- c. Material not snapped into blade pad guides
- d. Tensioner roller, slip roller, or blade, or blade pad not aligned correctly or worn out
- e. Wrong CCT parts used with carrier tape
- f. Pinch roller, driver roller, payoff arm mount not straight or worn out

6. Take-up not turning

- a. A time out is reached and the applicator needs to be cycled to re-start up the take-up
- b. Check the take-up clutch pack
- c. Check the take-up wiring circuit

7. Applicator will not cycle

- a. Put the applicator into run mode
- b. Check for error messages on the handheld screen
- c. Check for proper main air pressure
- d. Check the start signal wiring
- e. Check the main air valve functionality
- f. Check the main air valve e-stop interrupt circuitry
- g. Cycle power on the controller and put the applicator back into run mode
- h. Check the tamp valve and related flow controls

8. Applicator Interface Module Not Responding

- a. Make sure the AIM connector is fully connected to the back of the machine.
- b. Check if the LCD backlight is on. No backlight, possible bad screen or power issues,
- c. Check if the D2 diagnostic light is blinking on top of the controller. If it is blinking then the controller does not detect the AIM.
- d. Press the exit button three times and press the F3 button, and check if the applicator toggles in and out of run mode.
- e. Cycle power, check for proper voltage (5vdc +/- 5%)

d) Error Handling-Placer™

Before adjusting anything insure **PROPER MAIN AIR PRESSURE** and functionality of the related parts. Check for material debris and contamination (glue, adhesives, liner). Check for proper material threading. Check to see if proper **VALVE LIGHT** is on or off. Check if related flow controls have been adjusted or related pneumatic tubing is kinked or leaking.

Also if the applicator is showing error codes refer to the settings in the setup specs sheets to insure you have the correct parameters set for the product you are running. Turn the system off and then backed on to see if the problem goes away. Nautilus Systems Inc. stores back-ups of these sheets if they have been lost. The date on setup sheet shows the revision of that sheet.

Error codes/ possible solutions

Error Message	Description/Potential Solutions
Start Input is Latched on	Release the start signal. The start signal (SC input) needs to be taken away every cycle and then turned back on again for part placement.
Start Input is Required	The start signal was taken away before the tamp retracted and the applicator needs to have the start signal turned on again for the tamp to retract and feed the next part.
E-Stop is pressed	- Unlatch E-stop. - Check appropriate E-stop wires for connection (a Normally Closed circuit). - Check for proper connection of the external I/O plug and F9 Fuse Blown.
Guard Door open	- Improper Settings or Program. - Contact Nautilus Tech Support.
No/ Low Air Pressure	- Improper Settings or Program. - Contact Nautilus Tech Support.
Tamp at Pickup input Not ON	- Possible double part or label. - Check to see if the tamp is at pickup and the tamp position sensor board is operating properly. - Incorrect vacuum chuck used/incorrect height (too thick) - Turn FC2 flow control counter-clockwise. - Check pick-up valve. - Check pick-up cylinder.
Tamp at Pickup input Not OFF	- Check to see if the tamp is at pickup and the tamp position sensor board is operating properly. - Check tamp valve. - Turn FC3 Flow control counter-clockwise. - Check tamp cylinder.
Tamp Retract input Not ON	- Check if the tamp is fully retracted and the tamp position sensor board is operating properly. - Turn FC1 flow control counter-clockwise. - Turn the FC5 flow control counter-clockwise. - Check the tamp pickup height setscrew adjustment. It might need to be tightened clockwise.
Tamp Retract input Not OFF	- Make sure the tamp is not all the way retracted. - Check if the tamp position sensor board is operating properly. - Turn the FC2 flow control counter-clockwise. - Check the pickup valve. - Check the pickup cylinder.
Tamp Extend input Not ON	- Adjust the tamp extend pressure sensor (.1-.6 MPa). In the negative direction. - Turn the FC3 flow control in the counter-clockwise direction. - Check the tamp extend pressure sensor. - Check the tamp cylinder. - Check the tamp valve.
Tamp Extend Sensor Too Sensitive	- Turn the adjustment screw of the Tamp Extend Pressure Sensor Clockwise (increase the pressure required to make the switch come on). - Turn the FC3 flow control in the clockwise direction (this restricts air flowing into the tamp to prevent a transitional pressure spike).

Blade Home/Retract input Not ON	• Check to see if blade is fully retracted. Possible material blockage in slide. • Select the blade extend mode and hit exit to perform the blade home operation. • Make sure there is less than 1mm of play in the blade slide. Blade gear loose. • Check if motor amplifier disable input has been activated.
Blade Home/Retract input Not OFF	• Check to see if blade is not fully retracted. Possible debris blocking home sensor. • Check if blade speed and acceleration rate is adjusted correctly. • Make sure there is less than 1mm of play in the blade slide. Blade gear loose. • Check if motor amplifier disable input has been activated.
Blade Motion/Home Switch Error	• The blade is extended for homing and the blade retract sensor does not turn off • Possible debris tricking home sensor. • Make sure there is less than 1mm of play in the blade slide. Blade gear loose. • Check if motor amplifier yellow power lights are on. • Blade retract input stuck on, check wiring or retract sensor/controller
Vacuum Input Not ON	• Check to see if the part is lined up to the vacuum pad holes. The part should block all holes and typically the back edge of the label is aligned to the back edge of the chuck. • Check to see if vacuum module is operating properly. • Check vacuum pad for wear and related hoses for leaks or breaks. • Adjust sensitivity on vacuum module until red light on vacuum sensor turns on with the part located correctly on the chuck while the vacuum valve is on.
Vacuum Error Retries Exceeded	• Refer to Vacuum input not on. • If the vacuum error retries setting is turned to ON, the applicator will automatically retry to peel a part if it has unsuccessfully peeled a part in the previous try and the retries setting has reached its limit.
Material Edge Trigger Timeout	• Check if the optical sensor is operating properly (with the amplifier turning on its output when on a part) and has a valid trigger setting. • Check the pre-skip and skip length settings. • No part present within 5-6 seconds of searching.
Trailing Edge Seek Error	• When the material is being advanced out the sensor is looking for the trailing edge of the label, if the label has passed the sensor eye during skip length then the applicator will stop because the transition point has been passed. Check the setup specs sheet for proper settings. When a new part is being searched for, (trailing edge detection) the Material Sensor does not need to be OFF. If the sensor is ON right away it will use skip length to skip over the intended part edge. Exit Run Mode then pull the material back some before restarting. If using (trailing edge detection) the sensor must first see a part before feeding forward for pickup. • Adjust the trigger point setting on the sensor to avoid false triggering when no part is present (in front of the material sensor beam).
Leading Edge/Notch Seek Error	• When the material is being advanced out the sensor is looking for the leading edge of the label, if the label has passed the sensor eye during the initial find part move the applicator will stop because the transition point has been passed. Check the setup specs sheet for proper settings. When a new part is being searched for, (leading edge detection) the Material Sensor Should be OFF. If the sensor is ON before it should be then the material has probably been over-fed or the skip length are set to high and are skipping over the critical part edge or passed the sensed part. Exit Run Mode then pull the material back some before restarting. If using (trailing edge detection) the sensor must first see a part before feeding a part for pickup. • Adjust the trigger point setting on the sensor to avoid false triggering when no part is present (in front of the material sensor beam).
No Part Detected In 600mm	• During part feed the sensor state has not changed in 600mm. Check for parts underneath the sensor if not press F3 again after the error and retry to feed more parts. If there are parts underneath the sensor then the material sensor needs to be checked.
Part Misfeed (fed to far)	• During the pickup length move the part has been overfed passed its intended move length (electronic check, not an actual physical check for position).
Move Calculation/Trigger Error	• Incorrect move calculation. Material sensor state intermittent or unstable output (flickering).

Move Stop Error	• The code has stopped un-expectantly during the part feed operation.
Material Encoder Error	• The encoder is not functioning properly, check encoder module for proper functionality, if needed cycle power or select fixed pulse move.
Encoded Move Overshoot Error	• Material continued to move after drive roller was supposed to stop. Check move settings or lower seek and high speed and check material drive or encoder functionality.
Material/Encoder Slippage Error	• Material or encoder slipping, check pinch lever to be closed or functioning properly and proper functioning of the material drive. Check for proper encoder functionality. Check move settings or lower seek and high speed. This error message will be displayed if there is more than ~35mm of difference between the pickup move and the encoder value.
Dropped Label Error	• The label has been removed or dropped from the vacuum chuck. The error will be displayed if this setting is turned ON. Check for label and or location on the vacuum chuck. Check the vacuum sensor adjustments. Vacuum pad might need to be replaced.
Vacuum input is Stuck On	• The vacuum switch input is on before a part has been picked up. The applicator first turns on the vacuum generator before extending for pickup and checks the vacuum sensor state, if the setting is turned to ON, if it is ON to early it will stop and display the error.
No Motion Card is Found	• During boot-up the controller could not communicate with the motion controller card. Press and release the e-stop button or cycle power to re-initialize the card.
Motion Controller Communication Error	• The controller could not communicate with the motion controller card. Press and release the e-stop button or cycle power to re-initialize the card.

e) Applicator Program Sequence

1. Press F3 or trigger the remote run toggle input to put applicator into run mode (the F3 button will turn from enter run mode to exit run mode and the run mode output will turn on).
2. The blade motor starts to extend the blade slide out if clear blade edge setting is turned on then the material roller turns clockwise to advance the material and runs a pre-skip move if the pre-skip variable is set higher than 0, if the clear blade edge setting is not turned on the material will be fed out until the part sensor turns on then the blade will start to extend out with the material, if the blade pre extend setting is turned on then the blade will extend out first then the material roller will feed out the material.
3. The material motor advances material until the sensor output light turns on (find part move).
4. The material motor advances material if a skip length is present.
5. The material motor advances the material until sensor light turns off or on (trailing edge, leading edge, or notch sense).
6. The material motor runs the pickup move distance while using the encoder module (if encoded move is selected) and the blade motor stops the blade at its own calculated distance or specified extend distance if set to pre-extend blade mode.
7. The vacuum valve is turned on and the vacuum input is checked to be OFF, if the vacuum stuck setting is turned on.
8. The pickup valve is turned on and the pickup cylinder extends to move the tamp head to the pickup position.
9. After the vacuum sense input turns on, the blade motor retracts the blade slide and the material motor pulls the material tighter according to the tension length and the blade motor runs until the blade has retracted the same distance the blade had extended and verifies the blade home input turns on.
10. The ready output is turned on.
11. Controller monitors the vacuum sensor input to stay on, if vacuum sensor turns off during peeling the applicator will automatically run a retry if vacuum error retries is set higher than 0.
12. Controller monitors the start signal input.
13. When the start signal is turned on, the vacuum sense input is checked to be ON and if the dropped label error is turned ON and if the vacuum sensor is OFF the machine will display the dropped label error and if it is ON the tamp valve is turned on and the tamp extends and the clear output turns off (ready output stays on). If the ready output turns off right away then the vacuum sensor probably has turned off and the applicator will not extend the tamp with-out the vacuum sensor being on and will attempt to peel another part. The start signal will need to be given again once the ready output is turned back on.
14. If the start signal is released before the ready output is turned off, the tamp valve will turn off and the tamp will retract and the controller will monitor the vacuum sense input to be on and turn the clear output back on once the tamp retract input turns on. If the start signal is release after the tamp extend input is on but before the tamp retracts the start signal input is required error will be displayed until the start signal is given again.
15. The tamp, pickup valves and ready output will turn off once the tamp extended input turns on and the dwell and puff time delays expire (start input must be ON until dwell period begins).

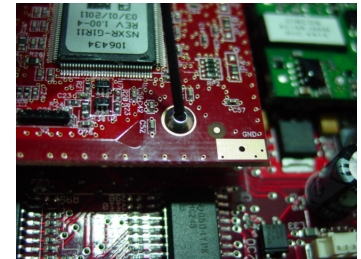
16. The controller will check for the tamp retract input to turn on and will turn on the clear output.
17. Program will start over.

Every time the machine is placed in extend blade mode and exit is pressed or the e-stop is pressed while the blade is extended the blade will retract until the blade home input turns on and then run the blade home length if it is set higher than 0.

f) Applicator Controller

The applicator controller contains the housing, main board, main processor (core), voltage regulators, and i/o. interfaces. The removable core contains the main processor and built in memory for the software to be loaded on it.

Do not remove the core unless you have been instructed to do by NSI or if you have a new core to put on. If you remove the core all your settings in memory will return to programmed default. If the settings are lost after power up then the back-up battery is faulty or the core has been removed or faulty. If the back-up battery has less than 2.5v then it needs to be replaced. Contact NSI for instructions on how to load your current settings to be the default settings if the core is removed or the back-up battery is faulty.



Avoid any contact with the control board as debris or static discharge can damage the board.

Controller Removal/Access.

To access the controller you must disconnect all power, AIM, and external i/o connection to the controller and disconnect all connectors plugged into the controller on top. Unscrew all four screws securing the controller. Carefully pull the controller straight out and tilt open the controller and disconnect the two fan connections and the one drive connector.

Core removal/replacement.

Document all your current settings and total cycle count on your setup sheet first. Remove the controller from the machine using the controller removal/access procedure on this page. Touch some grounded surface to eliminate the static in your body and remove the dome screw holding down the core using a .050 inch allen wrench. Then carefully pull it straight up by gently holding on at least two opposite outside edges. Slide the new core onto the headers while making sure you have properly aligned all the pins with the header and press the core on completely and secure the core using the dome head screw. Use the controller installation procedure to correctly install the controller back into the system. You will then need to check all your settings to be correct according to your setup sheet for that job.

Controller Power switch/Diagnostic Lights.

To turn on the system press the power button down for at least .5 seconds. Once the system turns on the blue power light will illuminate to show that the full power circuit has successfully turned on. To turn off power press the F3 button to take the system out of run mode, then hold the power button down for at least 2 seconds and the blue power light should turn off. If you are going to kill 24vdc to the applicator for safety it is recommended to press the F3 button first, but no harm will happen to the system.

If the AIM has been disconnected the D2 diagnostic light on top of the controller will continue to blink until it detects the AIM has been plugged back into the applicator.



When the system boots it is normal for both D1, D2 lights to turn on and then off.

D1 Diagnostic Light

If the system has been turned on and will not boot, check if both D1, D2 lights are on. If they are on that means no program is loaded on the core or it is corrupted and needs to be reloaded with new software or a new core needs to be purchased.

D2 Diagnostic Light

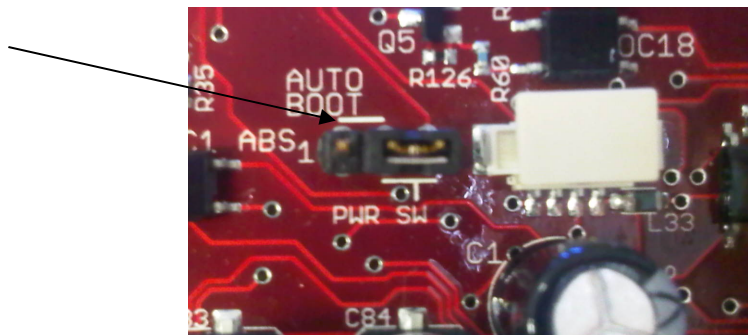
Communication port indicator. If the AIM has been disconnected it will blink continuously. The system will continue to cycle and function but there will be no error messages and you will not be able to put the system in or out of run mode using the AIM.

System Core-Programmed Part # 106435

Make a note of the software revision on the core and your current total cycle count and applicator serial # before ordering.

Auto-boot

If the system will be mounted in a guarded automated system you can have the applicator auto-boot when power is returned to the system. All systems ship with auto-boot disabled. If you want the applicator to auto-boot, you need to unbolt the controller and move the black jumper to the auto-boot position. Refer to the section "Controller Removal" for instructions.

Applicator Software

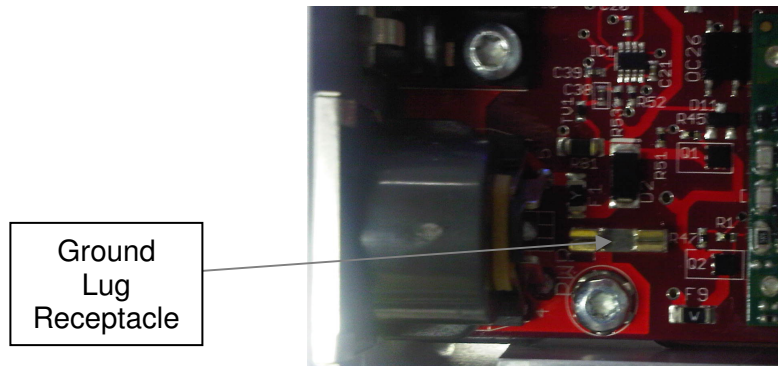
The applicator software is stored on the removable core module. If the core is removed your current settings will be lost and set to programmed defaults. The back-up battery keeps all the settings stored in the ram. Contact NSI to see if you can back-up your current settings to persistent memory after battery failure or core removal. If you have removed the core or if the back-up battery is faulty you will need to check all the settings including Robot mode to make sure you are in the correct mode for your model. Refer to the "Running I/O Test" section on how to check the password protected settings.

To check what revision of software your system has, refer to the AIM and from the home screen select F2 Stats, 1-Info Menu, 1-Start-up screen and the software revision will look like "PL-NSXR-G1-R12 Ver. 1.00". NSI can supply new cores with the latest software for your system. Refer to "System Core" on this page. Note: if you change the software you might have to make changes to your external system software to update it to the latest system handshake protocol.

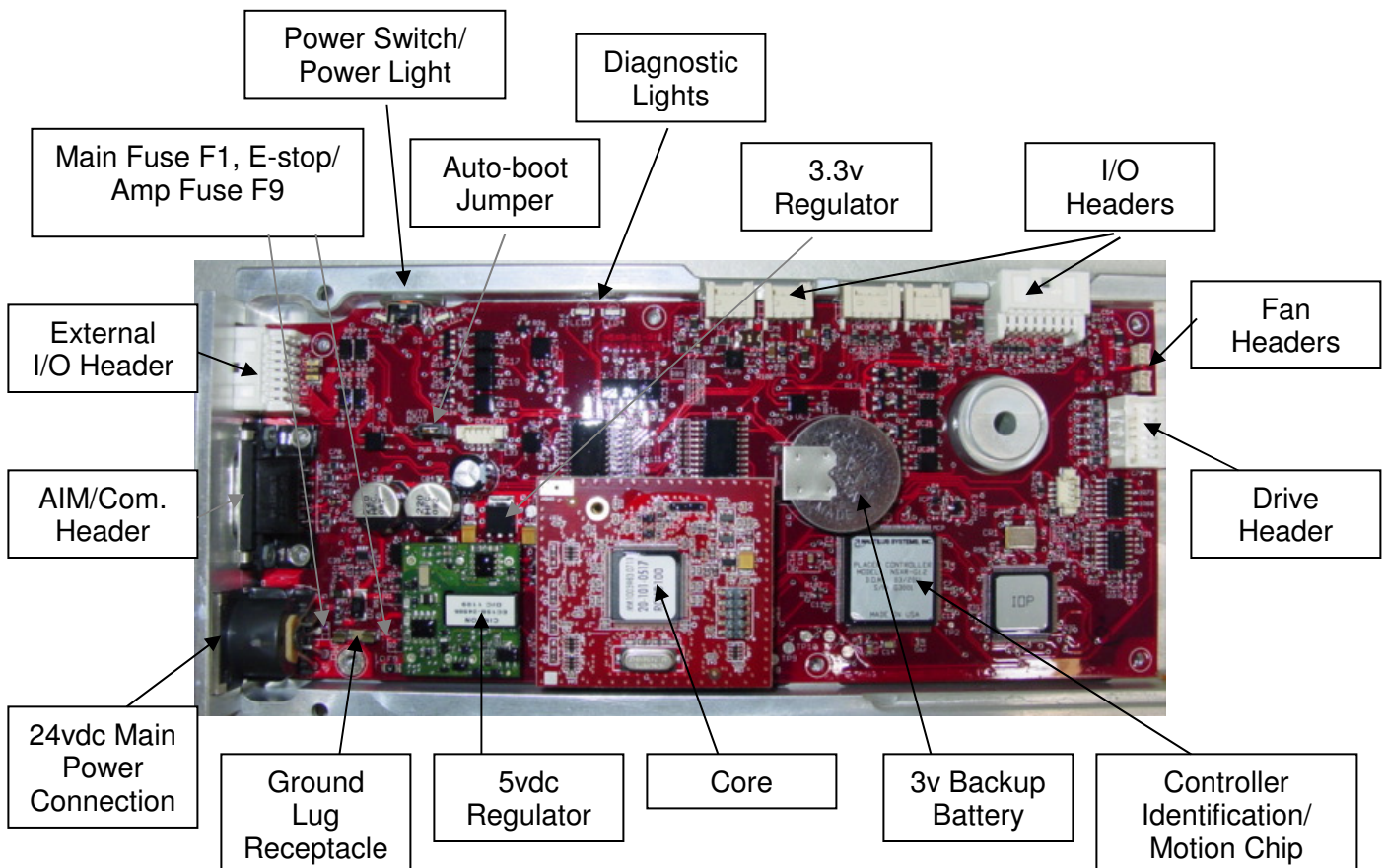
g) Applicator Controller (continued)

Controller Installation

Connect the two fan connections and the one drive connector to the drive header and slide the wires in the retaining clip and slide the controller straight in making sure the ground node plate engages into the ground receptacle in the lower right hand corner and mount the controller while making sure not to pinch any wires or connectors. Mount the controller using the four M3 screws and tighten securely. Connect all the i/o connections on top. Plug in the 24vdc power connector, AIM and external i/o connector to the back of the applicator. You might need to cycle power after the first boot if guard door input or any other error is persistent.



Main control board layout.



h) Running I/O Test

To put the applicator into **I/O Test Mode** you need to make sure the applicator is out of run mode, and make sure there is something solid underneath the tamp. Press F4 to enter Setup Mode and then press F4 again for Enter Authorization Code and you will need to type 987456 and enter. Pressing F1 will activate I/O Test Mode and you will be able to perform the following: Press exit when done.

Outputs

1 VA Vacuum Valve

Will Turn on the Vacuum Valve to create vacuum on the tamp head chuck.

2 PF Puff Off Valve

Will Turn on the Puff Valve to create a puff on the tamp head chuck.

3 TK Take up Motor

Will turn on the Takeup Motor to turn Clockwise.

4 TA Tamp Valve

Turns on the Tamp Valve to extend the tamp for placement. Use caution when turning on this output!

5 PU Pickup Valve

Turns on the Pickup Valve to force the tamp to the pickup position.

6 RDY Turns on the Ready output

7 CLR Turns on the Clear output Use caution when turning on this output! (if the tamp is extended and the clear is turned ON then the automation could move and damage the tamp or automation)

8 ERR Turns on the Error output

9 AMP Will turn on the amplifiers when the output is a 1.

(5) RNG Run Mode or Running Output

Will turn on the Run Mode Output when pressed (must be in robot mode to test this output)

i) Running I/O Test (continued)

Inputs

VS Vacuum Sense Input

Will display “1” when the vacuum sensor input is on for at least one second.

SC Single Cycle Input

Will display “1” when a cycle input is on for at least one second.

TR Tamp Retract Input

Will display “1” when the tamp retract input is on for at least one second.

TP Tamp Pickup Input

Will display “1” when the tamp at pickup sensor is on for at least one second.

TE Tamp Extend Input

Will display “1” when the tamp extended pressure sensor is on for at least one second.

BH Blade Home or Retract Blade Input

Will display “1” when the blade retract sensor input is on for at least one second.

MS Material Sense Input

Will display “1” when the material sensor trigger input is on

!ES E-stop OK Input

Will display “1” when the E-stop is not on

IN6 Optional input

Will display “1” when the input is on for at least one second (guard door input is optional on Placer™).

(RT) Remote Run Toggle Input

Will display “1” when the Remote Run Toggle input is on (must be in robot mode to test this input)

10) *New Material Setup Procedure*

Insure that the main air regulator is set to .5 MPa (72psi).

Turn on applicator and let it boot up.

Remove all old material.

Remove all CCT™ parts (if not the same as new job) vacuum chuck, blade pad, idler roller, tension roller, sensor feet (if removed). Remove the payoff reel plates.

Select the extend blade option on the applicator interface module to insure the pickup is set to the correct height using the tamp gauge block and precision blade pad or the blade edge (106245). The correct pickup distance is adjusted with the **pickup on** while stepping the blade back and forth while making sure the tamp just touches the blade pad.

The material offset needs to be determined, by using these equations:

Placer 100 Series: $W/2-60=D$ W= Width of carrier tape D= Distance

Slide the correct payoff reel plates onto the applicator, and align the inner reel plate to the correct offset distance.

Attach all CCT™ parts onto the applicator

String material through the applicator.

Select the extend blade option on the applicator interface module and press the #3 button until the blade pad is centered or underneath the part sensor or closer to the peel edge and align the sensor head and train it to the new material.

Input all the correct settings according to the applicator setup specs.

Run the applicator and adjust the vacuum switch and tamp extended pressure switch if needed.

11) *Applicator Assemblies*

<u>Print Number</u>	<u>Description</u>
100477	FOOT SPRING SENSOR VERTICAL ASSY
100838	FOOT SPRING SENSOR ANGLED ASSY
102052	APPLICATOR INTERFACE MODULE V2
106100	PAYOFF REEL ASSEMBLY INSIDE 3-INCH HUB 12-INCH REEL
106116	PLACER STEP MOTOR BLADE DRIVE EP ASSY
106117	PLACER STEP MOTOR MATERIAL DRIVE EP ASSY
106144	PL 100 OUTER PLATE ASSEMBLY
106148	PL 100 PINCH ROLLER ASSY
106200	PL 100 DRIVE ROLLER BEARING ASSY
107378	PLACER TAMP HARNESS-NSXR REV.B ASSEMBLY
106251	PLACER PINCH RELEASE LEVER ASSEMBLY
106252	PAYOFF REEL ASSEMBLY INSIDE 3-INCH HUB 16-INCH REEL
106253	PAYOFF REEL ASSEMBLY INSIDE 6-INCH HUB 12-INCH REEL
106254	PAYOFF REEL ASSEMBLY INSIDE 6-INCH HUB 16-INCH REEL
106255	PAYOFF REEL ASSEMBLY INSIDE 3-INCH HUB 16-INCH H.P.REEL
106256	PAYOFF REEL ASSEMBLY INSIDE 6-INCH HUB 16-INCH H.P.REEL
106257	PAYOFF REEL ASSEMBLY OUTSIDE 12-INCH REEL
106258	PAYOFF REEL ASSEMBLY OUTSIDE 16-INCH REEL
106259	PAYOFF REEL ASSEMBLY OUTSIDE 16-INCH H.P. REEL
106260	PLACER QUICK RELEASE TAKE UP CLAMP ASSY (optional)
106340	MATERIAL SENSOR AMPLIFIER-NSXR ASSEMBLY
106341	MATERIAL SENSOR AMPLIFIER MEGA-NSXR ASSEMBLY
106342	PLACER ENCODER MODULE-NSXR ASSEMBLY
106346	NSXR-G1 CONTROLLER ASSY
106511	PL 100 BLADE ASSEMBLY
106525	PL 100 SLIP ROLL ASSEMBLY
106700	PL 100 BLADE CHASSIS EP-NSXR ASSEMBLY
106600	PL 100mm PNEUMATIC TAMP HEAD SINGLE CYLINDER ASSY
106632	PL 100 PAY OFF ASSEMBLY
106670	PL 100 HOOD ASSEMBLY
106696	PL 100 TAKE UP-NSXR ASSY
107460	PL 100 TAKE UP ARM-V2 ASSEMBLY (optional)
106707	PL 100 TENSION ROLLER-NSXR ASSEMBLY

12) Schematics

107378c	Placer Tamp Harness Rev.b-NSXR
106345d	Placer Takeup relay-NSXR
106702a	Placer High Resolution Motor Amp Harness-NSXR
108247a	Placer Applicator Tamp Pneumatics Vacuum Persistence-NSXR
109219b	External I/O Two Hand Tie Down-NSXR V2(optional with series 1 base)

13) Contacting Nautilus Systems, Inc.

Nautilus Systems, Inc.

21608 N. 20th avenue
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