

PS V5000

OPERATOR'S MANUAL

Automated Programming and Handling



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PSV5000 Machine Components

This **Visual Index** of PSV5000 locates features and subassemblies on the machine.

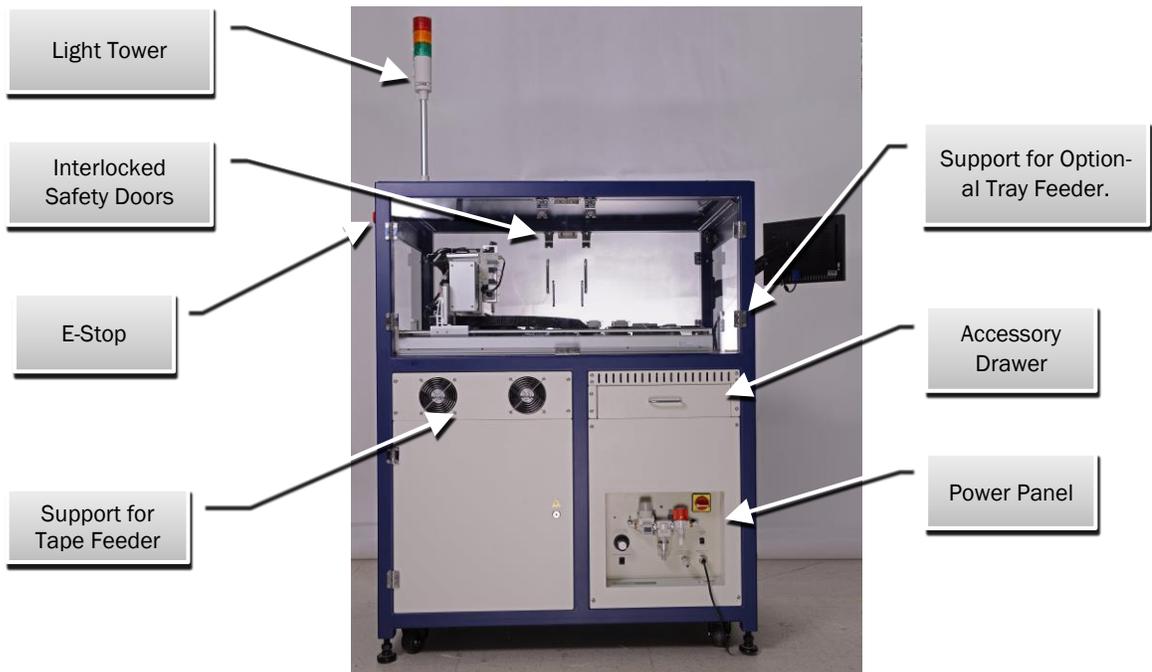
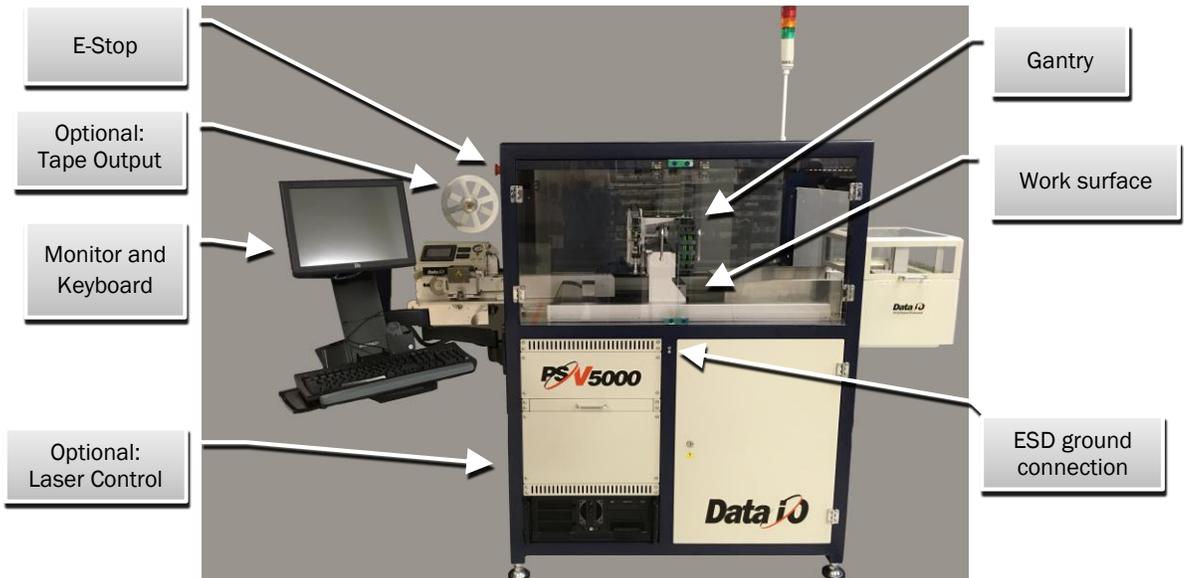


Figure 1: Features of PSV5000; front (top) and back (bottom)

Work Surface Components

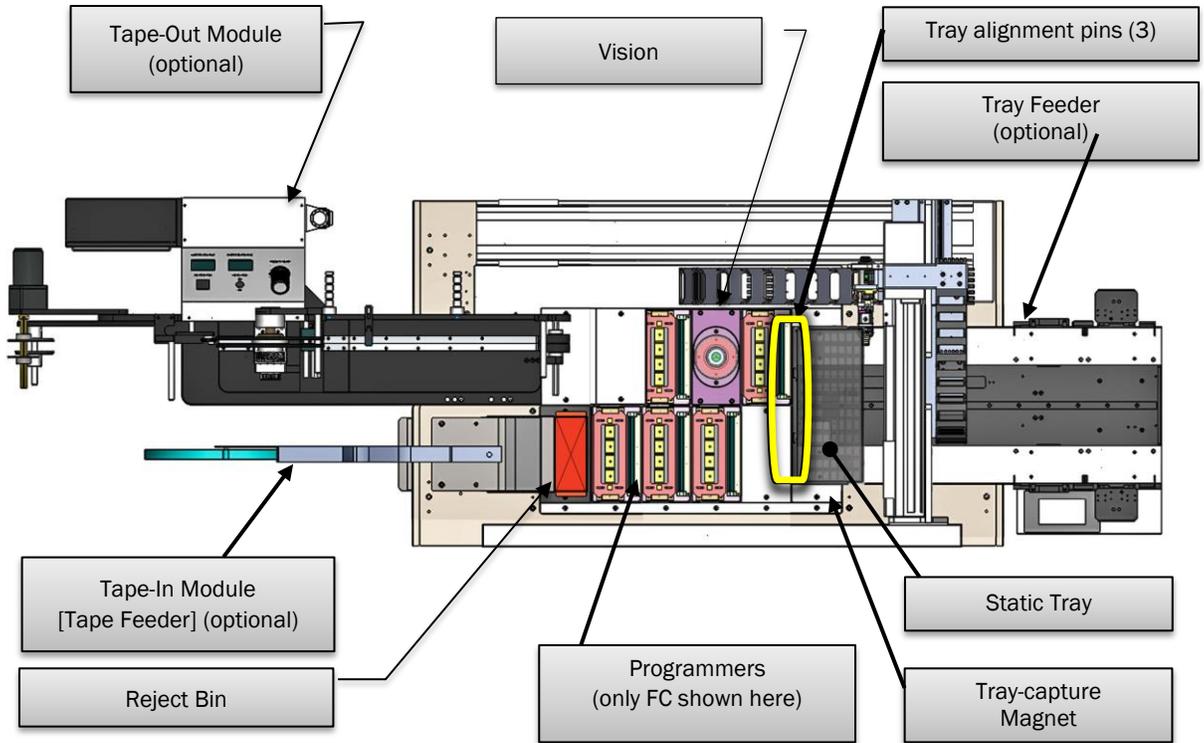


Figure 2: Some features on the PSV5000 work surface. The system can be configured with a reject tray or a reject bin. Note that the static trays and Tray Feeder would not both be used at the same time. (Refer to Owner's Manual or on-screen Help).

Power Panel Components

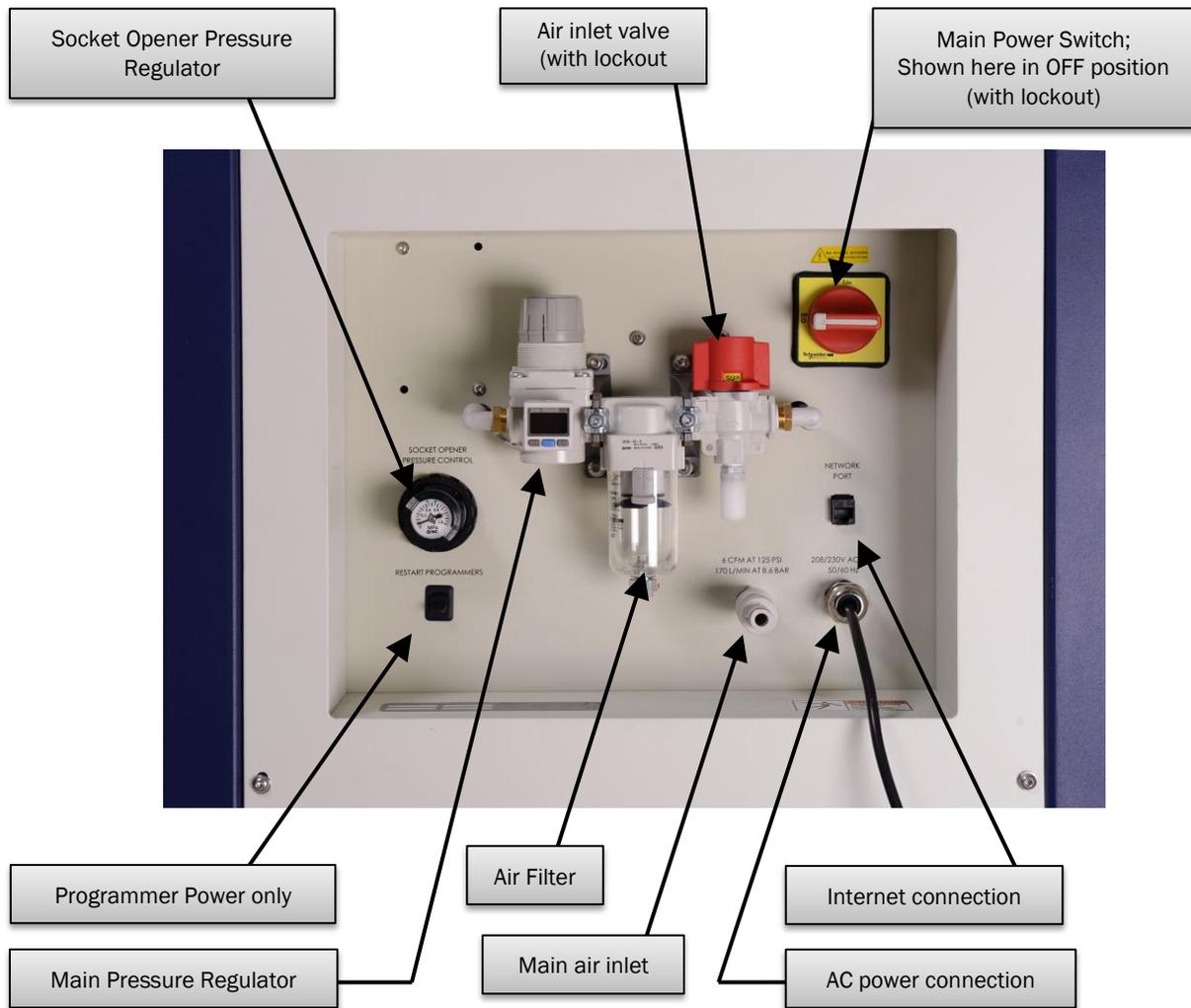


Figure 3: Rear View of PSV5000. For information on connecting the facilities, see the Owner's Manual.

Programmer Overview

Two programmer models are available for the PSV5000: both models can be installed next to each other, but programming jobs can only be set to use one model.

LumenX

Lumen™X is Data I/O's latest programmer at the time of this document. Each LumenX programmer requires one to two Actuator Plates and one to eight Socket Adapters for the specific device package being programmed. Each Socket Adapter has one socket.



Figure 4: One LumenX programmer with eight Sockets held down by four clamps actuated by two adjustable Actuator Plates. Orange arrows indicate Socket Adapters for the front half of the programmer.

LED Interpretation on LumenX Programmers



Figure 5: Each LumenX Socket Adapter has four LEDs and indicates PIN 1 as shown. All four LEDs light at once only during startup and go off when the startup procedure is complete. The Actuator Plate is not shown here for clarity.

Green = PASS PROGRAMMING
 Yellow = BUSY
 Red = FAILED PROGRAMMING
 White = CONTINUITY ERROR

FlashCORE III

Each FlashCORE III programmer requires an Actuator Plate and a Socket Adapter for the specific device package being programmed. Each Socket Adapter typically has four sockets.



Figure 6: FlashCORE III programmers on PSV5000.

LED Interpretation on FlashCORE Programmers



Figure 7: Each FlashCORE Socket Adapter has one red LED per socket. A) Standard Adapter; socket 2 has failed. B) HIC Adapter. Socket 3 has failed. The Actuator Plate is not shown on the HIC Adapter for clarity.

Supported Integrated Circuits (*Devices*)

- Flash Memory:
NOR, NAND, MCP, MMC, e.MMC, SD, MoviNAND, OneNAND, iNAND, Serial Flash, EEPROM, EPROM
- Microcontrollers
- Logic devices:
CPLDs, FPGAs, PLDs

Operator's Manual



Operation



For administrative functions and more, see the PSV5000 Owner's Manual is in the C:\CH700 directory on the Handler computer and also available on our Technical Library on our website).

This manual includes basic operation of the PSV5000 System, but not functions deemed *Administrator* functions such as creating a job, teaching Package Files, or creating a data file from a master device.

PSV5000 is a programming and handling system for traditional and fine-pitched integrated circuits (devices). It accepts most package types. The on-screen application that runs PSV5000 is CH700.

Operator functions include installing some hardware, checking hardware setup, turning on power, starting TaskLink, loading a job, and running a job. **Operators generally follow this sequence to process devices:**

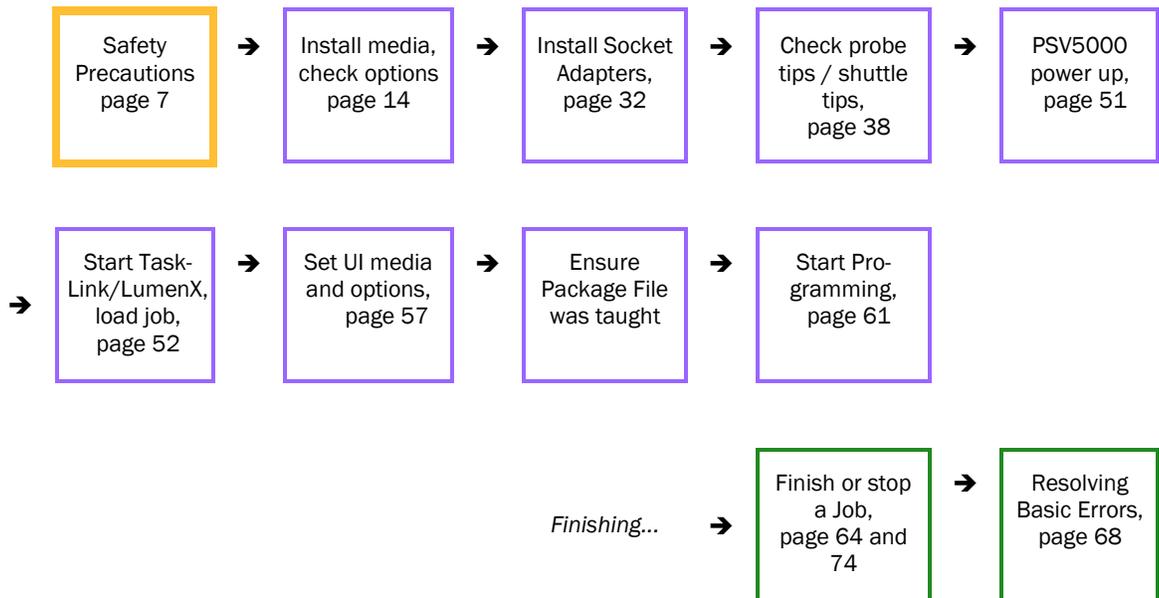


Figure 1: Operator Functions. For a list of these steps, see page 13.

Safety Messages and Precautions

For your safety and preventing lost time and damage to equipment, this manual uses special symbols, paragraphs, and color to call your attention to hazardous situations and recommends safe practices to help avoid them. Please read and heed the warning messages. They look like the ones below.

Warnings and Cautions

Special paragraphs with red lines are safety warnings as follows:



Definition of a
Warning->

WARNING: This is a warning message!
It has red text and calls your attention to potentially hazardous situations and practices that might injure people or cause serious monetary loss.



Definition of a
Caution->

CAUTION: *This is a caution message!*
It calls your attention to potentially hazardous situations and practices that might damage equipment.
(The potential loss is not as serious as a warning.)

Safety Symbols

This manual uses the following Safety symbols:



- Crush Point (Pinch Point) Warning
- Crush (punto de pellizco) ADVERTENCIA
- Crush (Prise Punkt) Warnung



- Electric Shock Warning
- ADVERTENCIA de descarga eléctrica
- Elektroschock Warnung



- General Hazard Warning
- ADVERTENCIA de peligro general
- General Hazard Warning



- Noise Warning; may be over 80 db
- ADVERTENCIA de ruido; puede ser más de 80 decibeles
- Lärm-Warnung; möglicherweise mehr als 80 Dezibel



- Eye Hazard Warning
- ADVERTENCIA de peligro del ojo
- Auge Hazard Warning



- Collision Warning
- ADVERTENCIA de colisión
- Collision Warning



- Laser Hazard Warning
- ADVERTENCIA de peligro del laser
- Laser-Hazard Warning



- Compressed Air Warning
- ADVERTENCIA de aire comprimido
- Druckluft-Warnung



- Electrostatic Discharge Warning (ESD)
- ADVERTENCIA de descarga electrostática
- Elektrostatische Entladung Warnung

Safety Systems

The PSV5000 System has several safety systems to prevent personal injury and system damage. These systems include E-Stops and safety doors. If your system has a Laser Module, it comes with a fume extractor.

Emergency Stop (E-Stop) Buttons

Two large, red Emergency Stop buttons are located near the top of the PSV5000 System—one on the left side near the front and one on the right side near back of the machine. When an E-Stop button is pressed, the gantry stops moving immediately. See the warning below.



If you have a Laser marker, the E-Stop on the front control panel only stops the laser.

To recover from an emergency stop, see [To Restart the System](#) on page 65.



Figure 2: There are two Emergency Stop (E-Stop) buttons: on left near front, and on right near back of the machine.



WARNING: Shock hazard! Pressing an E-Stop button removes power from the motion controller (gantry) only, and stops communication to the Laser Marking head. It does NOT remove electrical power from the PSV5000 or any optional equipment installed. Turn the main power OFF before opening any access doors.



WARNING: Pinch hazard! The E-Stop does not shut off air. Socket actuators can still move down and up.

**Park Position:**

Where the head stops when a job is paused or ended; near the side at center.

Tool Position:

Near front center for easy access to the PNP head.

Home Position:

Right rear; automatic initialization when a job is started.

Safety Doors and Interlocks

During operation, when the high-speed PNP head is processing devices, the clear plastic safety doors around the workspace are closed to protect operators from injury. Each safety door has a safety interlock which stops gantry movement if the operator forgets to first park the PNP head. See next heading.

Prior to opening a safety door

Normally, if the power is ON, before opening any safety door:

- at the Run window, a job should be either Paused or Finished (stopped), or
- at the Gantry window, the PNP head should be sent to the *park* or *tool* position (by clicking Park or Tool label), or
- at the Setup window, any time before a job is started.



WARNING: Possible collision hazard! The high speed and force of the gantry can seriously harm anyone working inside the workspace.

When working in the machine workspace, moving the PNP head must be the responsibility of only one qualified individual. All others must stay clear of the machine controls to prevent injury to that person.

Never bypass or otherwise render safety interlocks inoperable.



WARNING: Shock hazard! Opening the safety doors stops motion of the gantry only. It does not remove electrical power from the machine or any optional equipment.

Turn the main power OFF for safety unless otherwise directed.

Electrostatic Discharge

Devices (integrated circuits) are very sensitive to static, and could be damaged by unintended electrostatic discharge while being handled. So ensure a common electric potential (ground) exists between a static-sensitive device or component, its environment, and the operator.

Operators should wear an antistatic wrist strap (Data I/O part number 440-0021-001+) connected to one of the grounding connections on the machine. The wrist strap should contain a 1–10 M-ohm current limiting resistor.

Handling Devices Safely

To prevent damage to device pins, use a vacuum tool/tweezer to pick up devices. The vacuum tool is designed to handle devices without damaging them.



CAUTION: *Possible device pin damage! Do not touch devices with your hands or any implement other than the vacuum tool. Doing so could damage devices with fine-pitched leads.*

Vacuum tools use a squeezable air bladder for suction. There are a variety of models, sizes and tips. Some tips are replaceable.

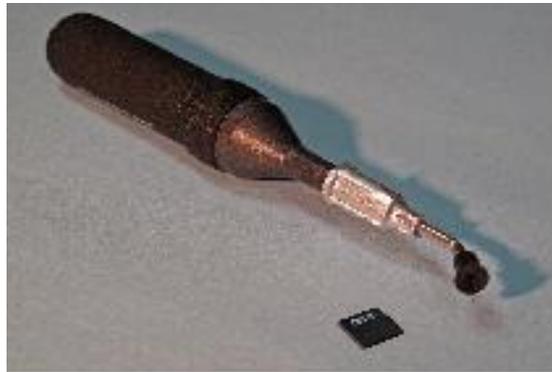


Figure 3: A Vacuum Tweezer: Data I/O PN 565-8000.

General Precautions

To avoid possible personal injury or damage to the equipment, please observe the following practices:

- Only **trained personnel** should install, maintain, repair, or troubleshoot this system.
- Do not operate the system unless you have been thoroughly trained, and have **read and understand the instructions** in this manual, particularly those that describe the system's safety features.
- Do not operate the system if the **safety shield doors or access doors** are not in their normal operating positions (unless you are a Data I/O trained technician and are explicitly directed to do so by instructions in this manual).
- Do not operate while servicing, replacing, or adjusting any component unless directed to do so in this manual. Make sure that the machine is **properly shut down** before working on PSV5000.
- Do not place any part of your body into the direct path of **moving parts**.
- **Do not disable** or attempt to defeat any of the protective safety features of this system. Personal injury or equipment damage can occur if any safety systems are disabled. If you suspect that a safety feature is damaged or malfunctioning, stop using the machine immediately and contact Data I/O Customer Service or a local Data I/O approved service representative.
- Use extra caution when working within the work surface. **Open safety doors do NOT cut power** to all systems. Actuators can still operate.
- Wearing **hearing protection** is recommended while operating the machine if sound pressure levels exceed 85 decibels. Sound levels may exceed 85 decibels depending on auxiliary equipment running and your environment.
- Shut off the **pressurized air** or disconnect the air hose before servicing pneumatic parts.

Running a Job on PSV5000

Requirements

Requirements prior to running a job on PSV5000:

- A *task* or *job* for your target device must already exist. This is generally an administrator function. Refer to TaskLink's online Help or Chapter 3 of the Owner's Manual.
- You need to know the device and Socket Adapter for the target job, as well as what input and output media is needed.
- Make sure all assemblies needed for the target job, such as the Single Tray Feeder, a Marking System or the Tape Output System, are installed on the PSV5000 Machine. Refer to Chapter 2- *Set Up* of the Owner's Manual for more information.

Operators, please read *Safety Systems* on page 7 through page 12 (if you have not already). You should generally be familiar with the PSV5000 System.

List of Steps to Start a Job

Operator functions are in chronological order as follows:

1. Checking the System on page 14
2. Installing Input/Output Media on page 14
3. Socket Adapters and Actuator Plates on page 31
4. Installing the Correct Probes on page 38
5. Turning PSV5000 System Power ON on page 51
6. Selecting a Job and Starting CH700 on page 51
7. (Optional) Preselecting Programmers on page 56
8. Setting Media and Options—the Setup Window on page 57

NOTE: *The Package File should already have been taught. If not, see the PSV5000 Owner's Manual or your administrator.*

9. (Optional) If an Automatic Tray Feeder is installed, see page 45.
10. (Optional) If Tape Output is installed, see page 23.
11. (Optional) If Laser Marking is employed, see page 44.
12. Starting Programming on page 61.

After Starting a Job...

- Stopping the System on page 64.
- Light Tower Interpretation on page 68.
- (Optional) Changing Programmer Status on page 70.
- Turning PSV5000 System Power OFF on page 74.
- (Optional) Operating the Single Tray Feeder on page 76.

1>> Checking the System



PSV5000 Machines must be level and at room temperature before running a job.

Before you set up for your job, check that:

- All side panels and doors are closed
- No one is working on the machine.
- The external air line is connected.

NOTE: *If the power and air pressure switches are already ON, the pressure indicator number should be green.*

2>> Installing Input/Output Media

Some optional equipment needs to be set up or their settings checked and power turned ON, or a process started (even if the equipment was installed by another individual, such as the administrator).



Regardless of input media used (trays or tape), all should offer devices right-side-up ('live bug' orientation.)

CAUTION:  ***Electrostatic discharge (ESD) hazard! Wear an ESD strap or discharge static against a common ground to prevent damage to Socket Adapters and devices.***

CAUTION:  ***Safety hazard! Possible personal injury from moving machinery. Always make sure that the PNP head is stopped in the Park or Tool position before opening any access doors.***

These input/output media are described in this section:

- Static Trays (next heading)
- Tape Feeder Input
- Tape Output

For the Tray Feeder input, see *Setting Up an Automatic Tray Feeder* in the PSV5000 Owner's Manual.

If your job or work process uses other options such as a Barcode Scanner, make sure they are installed and ready. Check with your administrator or see the PSV5000 Owner's Manual.

Setting Up Device Trays and Reject Bin

Static trays (no Tray Feeder) are installed using magnets to hold them in place. The standard setup is described below.



Your system administrator generally has information on pin 1 orientation for tray and tape input.

NOTE: *Make sure that the correct devices for the target job are loaded into the input tray and that they have the correct pin 1 orientation. (If pin 1 orientation doesn't match pin 1 that is set in the Package File it must be corrected).*

On the PSV5000, Pin 1 on Data I/O sockets is toward the left side of the Socket Adapter (viewed from the front of the machine).

Orientation of Trays

FOR TRAYS ORIENTED with the long side parallel to the **Y-axis**, orient the input and output trays with the beveled corner to the near right.

- The **input tray** goes on the right closest to machine center.
- The **output tray** installs on the far left mount.
- If a **reject tray** is used, install it on the left.

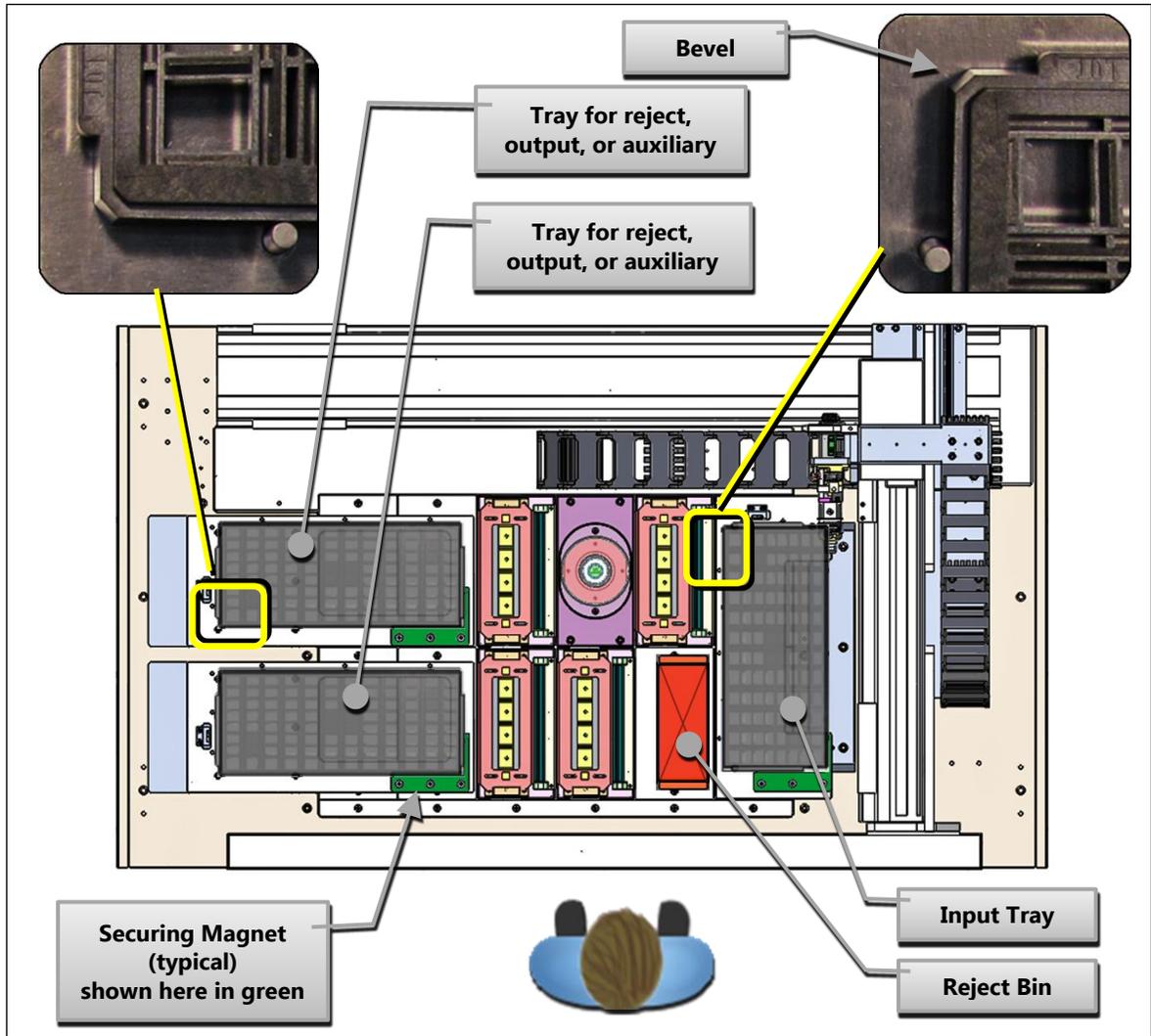


Figure 4: Common static tray locations. A reject bin may be used instead of a tray. The reject bin can be installed at any programmer location. Note that generally a reject bin and reject tray would not both be used.



If the PNP head is not in the Park position,

A) Refer to [Turning PSV5000 System Power ON](#) on page 51, and

B) then refer to the on-screen Help.

Installation of Standard Static Trays

When static trays are used, typically there are three tray mounts on the workspace—input, output, and reject (near left).

NOTE: *If using optional input/output media, you might not need to install some, or any, of these trays.*

To set up the static trays for input and output (refer to Figure 4:):

1. From the front, with safety doors open, set the *input* tray onto the right mounting plate. The chamfered corner should be next to the sensor.
2. Push the tray snug against the locating pins on two sides and place the magnet at the corner opposite the rows of locating pins.



Figure 5: To install a tray, index it along the pins (circles). The chamfered corner for the *input* and *output* trays is at the far left corner. *Input* tray position shown.

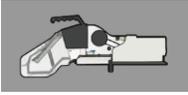
The output tray installation is oriented 90° from the input and generally located to the **far** mount on the left.

The reject tray is generally at the **near** left.

CAUTION:  *Temporarily removing an input or output tray has consequences. Sensors register a tray's presence.*

If an input tray is removed and then returned to the mount while a job is Paused, the software proceeds as if the tray is full and all devices are unprocessed. For the output tray, the software proceeds as if the tray is empty.

Installing the Tape-In Module Option



PSV5000 can be configured with an optional Tape-In Module (Tape Feeder) for input media. The Tape Feeder installs on the left of the machine. A safety plate covers the opening in the safety door when a feeder is not installed.

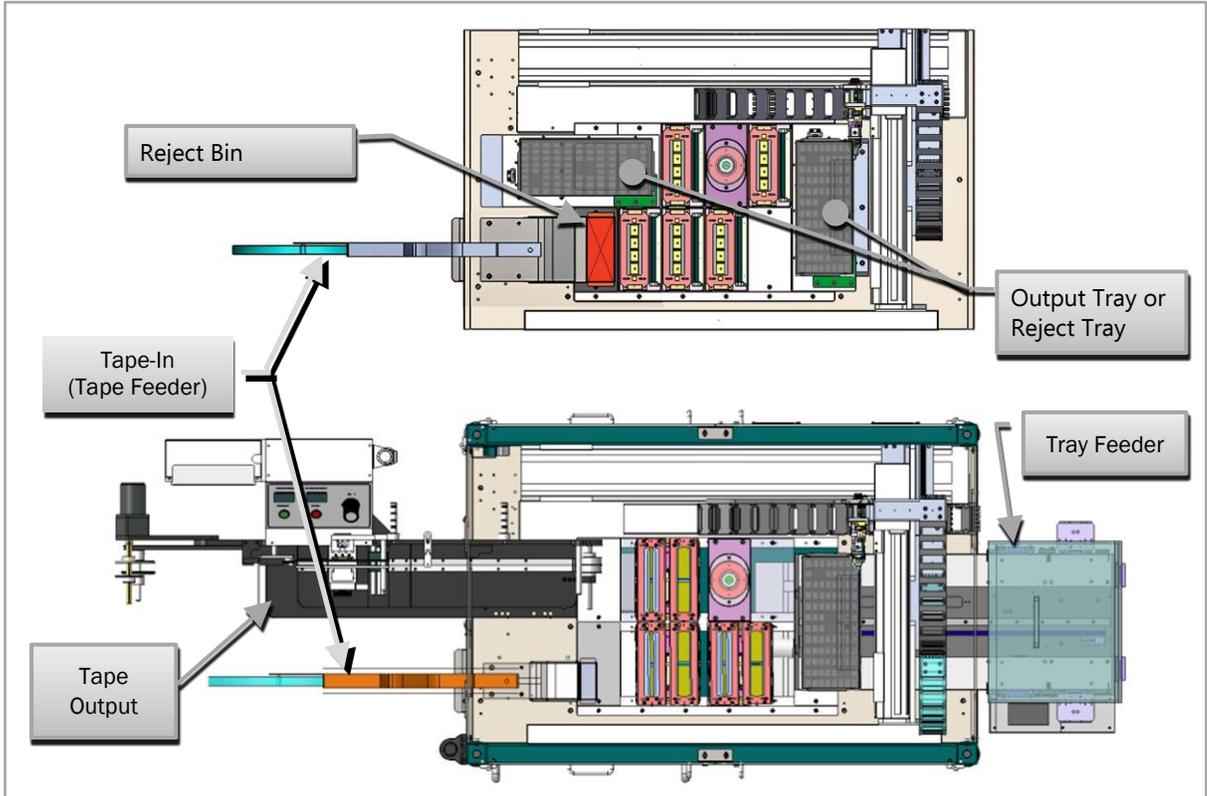


Figure 6: Possible layouts with tape input; Top—5 FC programmers shown; Bottom—3 LumenX programmers shown.

To install a Tape Feeder for input:

1. At the monitor, stop any job that is running.



Tape input feeders are available to match device tape widths. The last two digits of the Tape Input Feeder part number indicate the tape width.

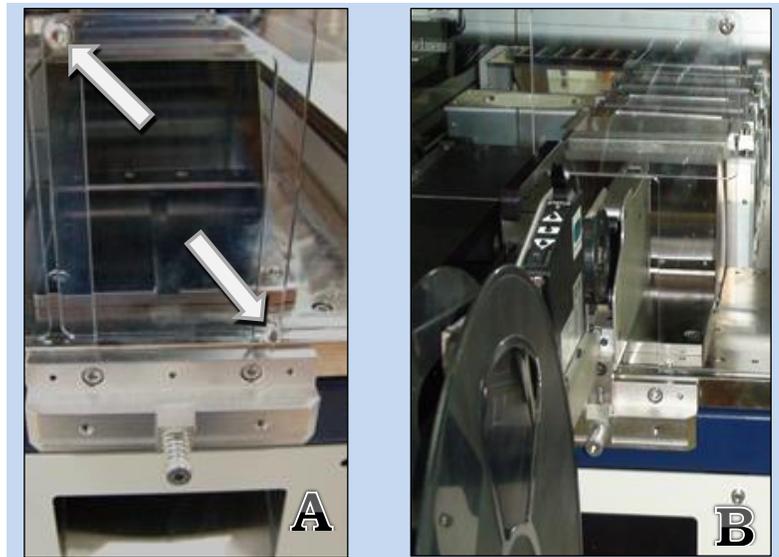


Figure 7: Use a 3 mm hex key to unscrew the two screws (arrows) securing each of the two safety plates. The safety plate has removed in image B.

2. Remove the two screws securing the small safety plate (3 mm hex key) and remove the plate. Refer to the figures above.
3. Align the rail on the bottom of the feeder with the channel on the PSV5000 base plate.
4. With the feeder in the channel, slide it inward. When the feeder reaches the spring latch, lift it over to the far side of the latch and push down to secure. Refer to Figure 8: and Figure 9: .

If device tape is already loaded on the feeder, ensure it gets started down the chute in the workspace.

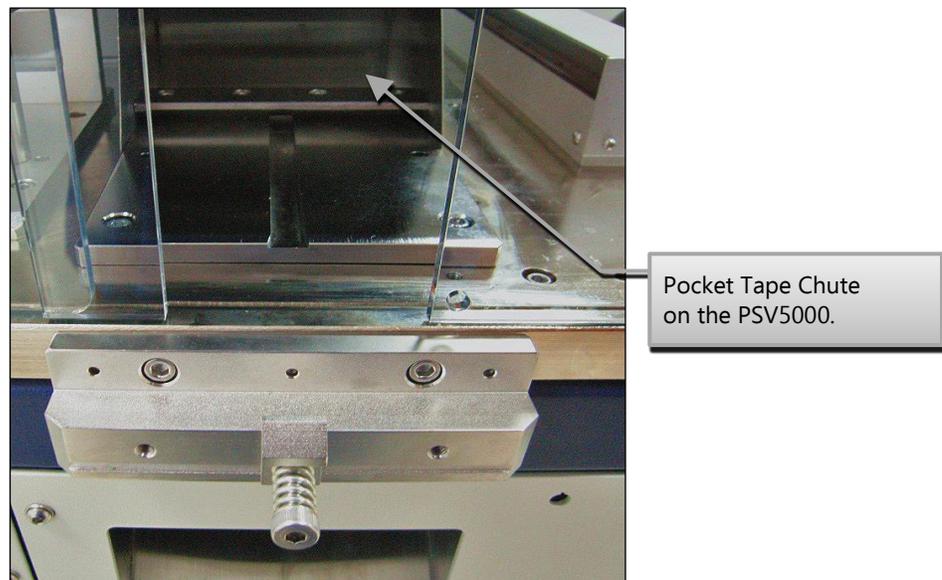


Figure 8: The Tape-In slot and spring clamp on PSV5000.

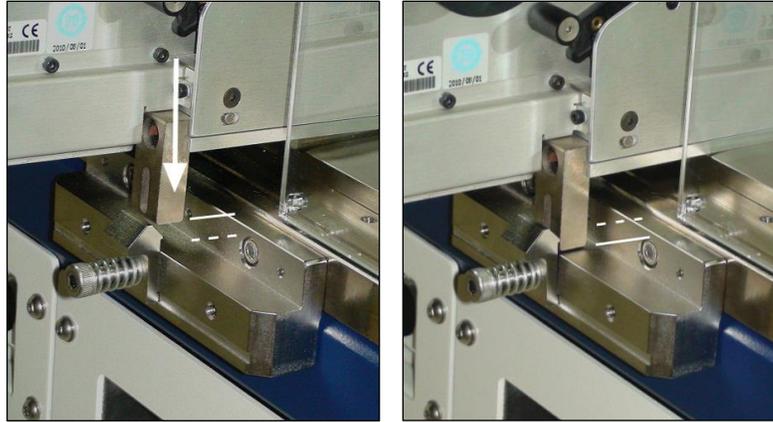


Figure 9: A. Push the mounting block of the Feeder down into the clamp. B. Feeder has snapped into place.



To remove the Tape Feeder communication cable, grasp the collar and pull out.

5. Insert the communication cable part way into the socket on the handler and, while pushing lightly, rotate until the connector is oriented correctly (it stops and makes a slight click sound when it goes all the way on).

The feeder Status lamp *should* light if the PSV5000 is on.

6. Install the device reel if it is not already.

NOTE: For more information about loading a reel of devices onto the feeder, see the documentation that came with your tape feeder.



For more information about threading carrier tape, see the manual that came with your tape feeder.

5. Pull the carrier tape forward to start it into the sprocket wheel on the tape feeder. Now you can advance the carrier tape, via the tape feeder, into the exit chute. Refer to previous figures for the tape chute.

The empty device *carrier* tape will come out of the slot below the mounting latch. Place a box on the floor to contain empty carrier tape.

6. Thread the *cover* tape through the tape window and onto the feeder's cover tape roller.
7. Adjust pitch. Count the number of sprocket holes in the carrier tape between the center of one pocket and the center of the next pocket. Use this pitch number and follow the instructions for your particular Tape Feeder to set the pitch index.

Later, after the PSV5000 has been powered up, remember to align the pick point—



Remember to remove cover tape from the cover tape reel when full. For more information, see your Tape Feeder documentation.

- A. On the Gantry window, press Park.
- B. Advance the carrier tape until the pick point mark on the feeder aligns with the center of a pocket. It may be necessary to advance the tape forward one pocket.

Installing the Tape Rewind Module

Install the Tape Rewind (Take-Up) module onto the front panel below the Tape Feeder Module as shown in the figure below.

1. Secure the Take-Up frame to the front panel.
2. Connect the power cable.
3. Install the proper sized take-up reel.

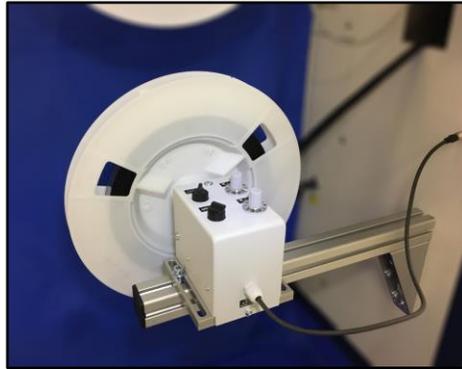


Figure 10: The Tape Rewind/Take-Up module on PSV5000.

4. Power **On** the Tape Rewind and confirm the spindle starts spinning.



Figure 11: The Tape Rewind motor controls.

5. Verify that the control knobs function properly:
 - Change **Direction** of rotation (upper-left knob, as depicted above)
 - Adjust the **Tension** of rotation (upper-right knob)
 - Adjust **Speed** of rotation (lower-right knob)

Operating the Tape Rewind Module

The only connection on the Tape Rewind module is for electrical power, so it has no communication interface and does not require any software configuration in CH700, WinAH400.ini, or otherwise.

- If there is excessive slack in the empty carrier tape, then increase **Speed**
- If Tape Rewind is pulling too hard on empty carrier tape, then decrease **Tension**

The Tape Rewind module is ready for operation: load your tape-in feeder, start your programming job, and watch the Tape Rewind module neatly wrap the empty carrier tape around the spindle/reel.

If you need to reverse the taper for any reason (go back one pocket instead of advancing), remember to first change the **Direction** of rotation on the Tape Rewind module. Else, the Tape Rewind may cause problems if it is pulling the empty carrier tape in the opposite direction from which the tape-in feeder is also pulling.

Checking the Tape Output Option

Set up of the Tape Output is described in the PSV5000 Owner's Manual.



Figure 12: The Taper/Tape Output module.

Routing the Carrier Tape

1. On the lower spindle below the Taper, mount the **carrier tape reel** and ensure the tape unwinds from the bottom of the spindle.
2. Route the carrier tape by feeding it into the loading track. Ensure the tape pockets are face-down when first guiding the tape from the bottom. Then ensure the pockets are face-up when the tape rounds the corner at the place-point (depicted below on the right).

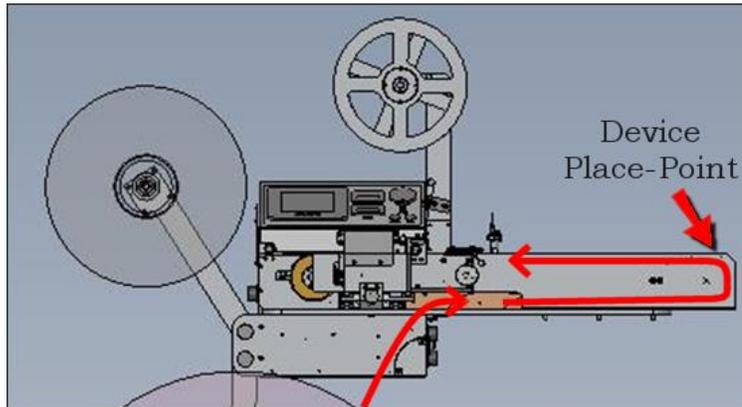


Figure 13: Routing the carrier tape.

3. Now pull the end of the carrier tape past the sealer and align the sprocket holes on the tape with the teeth of the drive sprocket.

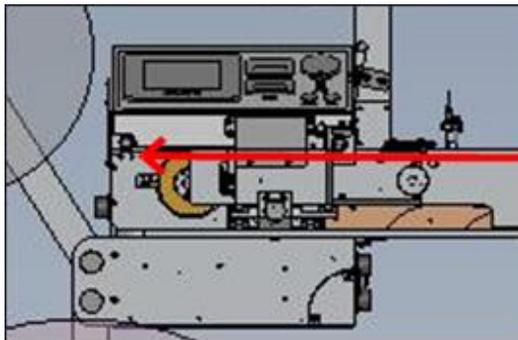


Figure 14: Pulling the carrier tape past the sealer.

4. Ensure there is an empty **take-up reel** on the take-up reel spindle.

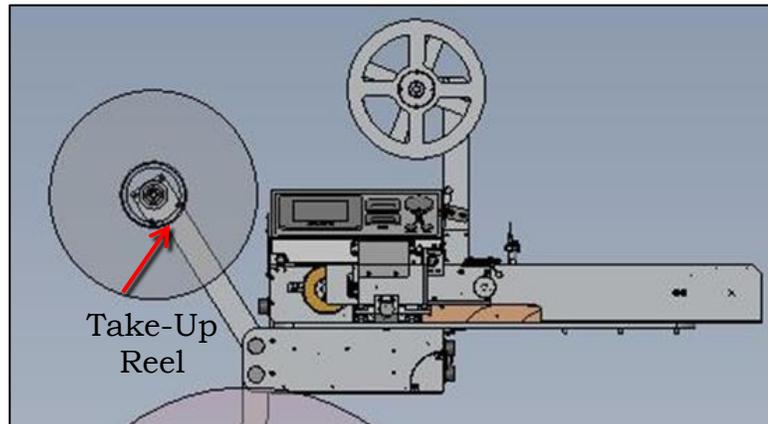


Figure 15: Mounting an empty tape take-up reel.

Routing the Cover Tape

1. On the upper spindle above the Taper, mount the **cover tape reel** and ensure the tape unwinds from the bottom.
2. Route the cover tape by feeding it down into the loading track such that it meets with the carrier tape.

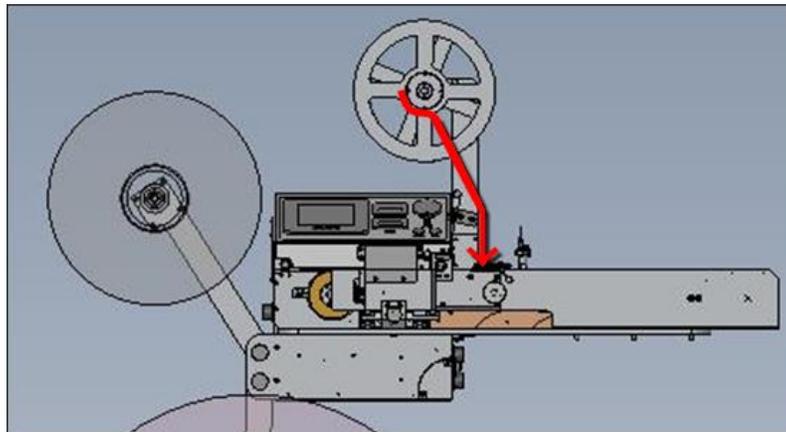


Figure 16: Routing the cover tape.

3. Use adhesive tape to bind the end of the cover tape to the carrier tape, and then feed both tapes together through the track and sealer.
4. Ensure proper alignment: the cover tape should run parallel with the carrier tape, and the cover tape should adequately cover the carrier tape width (as depicted below).



Figure 17: Align cover tape parallel with the carrier tape.

5. Run the machine to advance the tape through the sealer.
6. Use adhesive tape to secure the end of the tape to the take-up reel.
7. On the left side of the controller box, use the **Up** and **Down** arrows to control the motor tension.



Figure 18: Press 'Up' and 'Down' arrow buttons for motor tension.

Configuring the Heat Sealer

Complete the following steps to configure the heat sealer. For steps on configuring the press sealer, see page 28.

1. On the Control Panel, press the **Heat** button to power-up the sealer.
2. Set the temperature using the temp controls (145° C recommended).



Figure 19: Temperature controls for heat sealer.

3. Set the air pressure for the heat shoes (0.35 MPa recommended).
4. On the touchscreen, in the lower-right corner of the Status screen, press the DOWN arrow for the next screen.

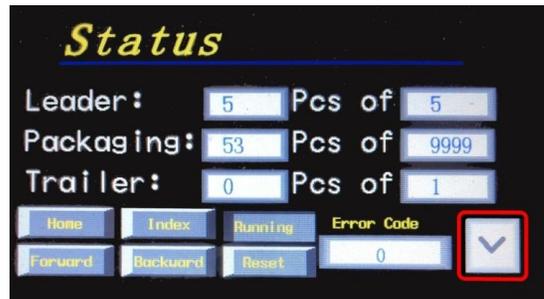


Figure 20: Press 'Down' arrow button for next screen.

5. On the Setting screen, set the desired parameters for the job (Pitch, Dwell time, Speed, Packaging/Count, etc.), and then press the Up arrow (lower-right corner) to return to the Status screen.

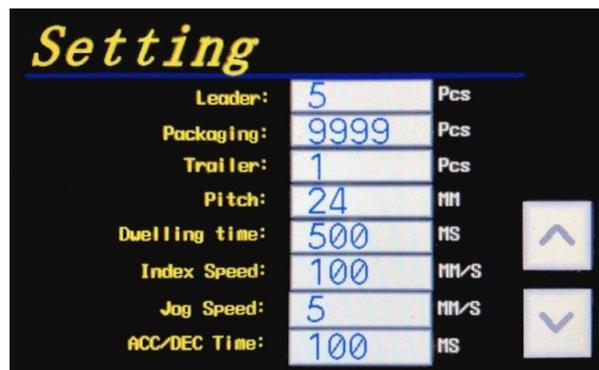


Figure 21: Job parameters on the Settings screen.

6. Dry-run a few parts using the foot switch.
7. Inspect the sealed tape for any wrinkles and creases (re-check alignment of tapes), and ensure that the sealing quality is adequate.
8. To adjust the outer heat shoe position, turn the outer sealer position adjustment knob (as depicted below).



Figure 22: Adjusting the outer heat shoe position.

9. To adjust the inner heat shoe position, turn the inner sealer position adjustment knob (access the knob from underneath the taper).

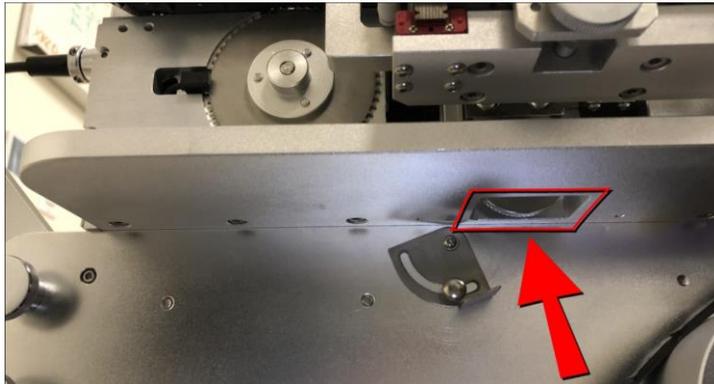


Figure 23: Adjusting the inner heat shoe position.

10. Confirm that taped devices are securely held in the take-up reel:
 - Perform a **peel-back/peel-force test** by peeling the cover tape from the carrier tape, paying attention to how well they adhere.
 - Perform a **twist test** by giving the tape a slight twist, noting if the cover tape detaches from the carrier tape.

If either test produces loose cover tape, increase the roller pressure of the press sealer (turn the sealer adjustment screw clockwise).

If the cover tape is intact after completing both tests, then visually inspect the taped devices for any excess adhesive/glue. If adhesive is visible, then decrease the roller pressure (turn the sealer adjustment screw counter-clockwise) and test again.

11. The Taper is ready for operation. On the Status screen, press Run.

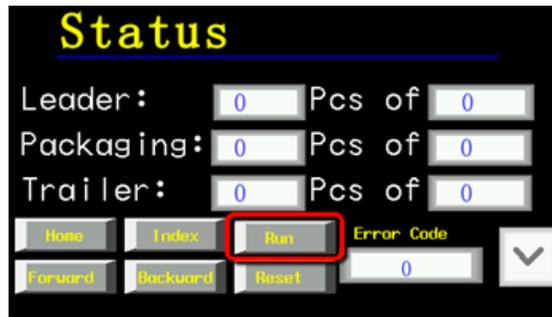


Figure 24: Press 'Run' button to start the taper.

Configuring the Press Sealer

1. On the Control Panel, ensure that **Power** is On but **Heat** is Off.



Figure 25: Ensuring the 'Heat' button is OFF.

- On the touchscreen, in the lower-right corner of the Status screen, press the Down arrow for the next screen.
- On the Setting screen, set the desired parameters for the job (Pitch, Speed, Packaging/Count, etc.), then press the Up arrow (lower-right corner) to return to the Status screen.

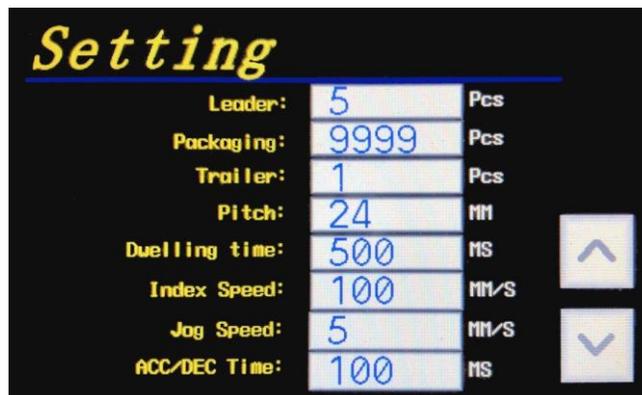


Figure 26: Job parameters on the Settings screen.

4. Dry-run a few parts using the foot switch.
5. Inspect the sealed tape for any wrinkles and creases (re-check alignment of tapes), and ensure that the sealing quality is adequate.
6. To adjust the press sealer (roller) position, turn the sealer position adjustment knob (as depicted below).



Figure 27: Adjusting the press sealer/roller position.

7. To adjust the press sealer rollers pressure, rotate a 3mm hex driver in the press sealer adjustment screw hole (as depicted below).

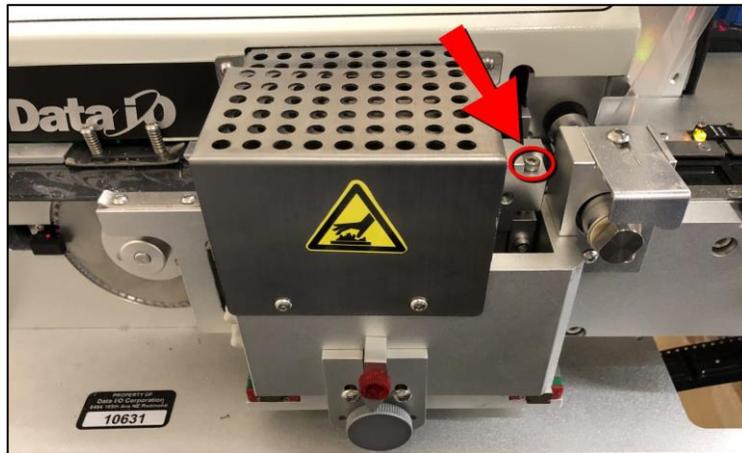


Figure 28: Adjusting the pressure of press sealer/roller.

8. Confirm that taped devices are sealed securely in the take-up reel:
 - Perform a **peel-back/peel force test** by peeling the cover tape from the carrier tape, paying attention to how well they adhere.
 - Perform a **twist test** by giving the tape a slight twist, noting if the cover tape detaches from the carrier tape.

If either test produces loose cover tape, increase the roller pressure of the press sealer (turn the sealer adjustment screw clockwise).

If the cover tape is intact after completing both tests, then visually inspect the taped devices for any excess adhesive/glue. If adhesive is visible, then decrease the roller pressure (turn the sealer adjustment screw counter-clockwise) and test again.

- The Taper is ready for operation. On the Status screen, press Run.

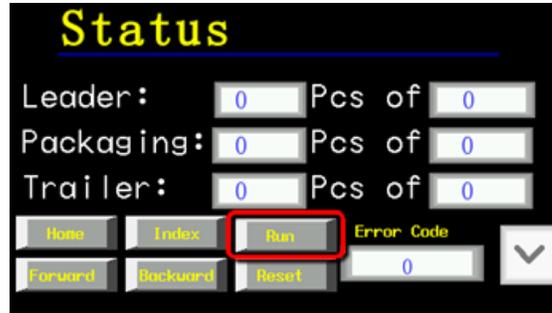


Figure 29: Press 'Run' button to start the taper.

NOTE: Use the counter on the Taper if desired. However, we recommend setting this counter to zero and using the pass quantity on the PSV5000 System to monitor quantity.

When the PSV5000 job is run, devices are placed at the Tape-Out pick point.

Ending a Run of Taped Devices

When the batch size has been reached:

- If the Empty Pocket Sensor was used, then scroll down on the Touchscreen to the Function menu, then disable the sensor.
- Reset the counter to zero (if used) and run out the desired leader length.
- Cut the carrier tape and cover.

Replacing a Full Take-Up Reel

- Leave the job-specified number of empty pockets on the carrier tape.
- Cut the carrier tape.
- Roll carrier tape onto take-up reel and remove reel.
- Install empty take-up reel.
- Continue job.

3>> Socket Adapters and Actuator Plates



Programming can only be performed on one type of programmer per job, FC or LX.

Data I/O recommends installing Socket Adapters before a job has been started (before the CH700 Software is started). However, PSV5000 power can be ON.

Finding Socket Adapter Part Numbers

To find the correct Socket Adapter part number for your device/job—**If CH700 has not yet been started:**

1. Open TaskLink.
2. Select your target job.
3. Click Edit, and then Footnotes.

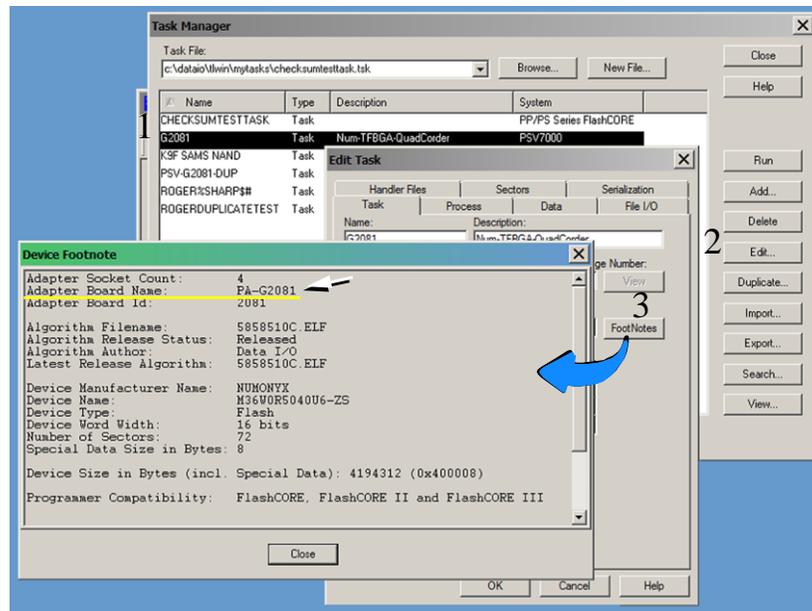


Figure 30: Footnotes dialog in TaskLink lists the Socket Adapter Number.

If CH700 has already been started, you can find the correct Socket Adapter Part Number for your device two ways without having to exit CH700:

- If you already have a Package File and you've named it after the Socket Adapter, navigate to the **Setup > Job Info** window and see the **Current Job** field. Or . . .
- On our Web site:
 - 1) Click **Support > Device > Search for Support**,
 - 2) Type your device PN into **Device PN** field,
 - 3) Click **Begin Search for Devices**. See the PNs in the right, results column.



CAUTION: *Electrostatic discharge (ESD) hazard! To prevent damage to Socket Adapters and devices from ESD, always wear an antistatic wrist strap.*

The wrist strap should be connected to the grounding socket on the front of the machine and should contain a 1 M-ohm to 10 M-ohm current limiting resistor.



WARNING: **Pinch hazard! SOCKET ACTUATORS CAN STILL MOVE UP AND DOWN WHEN THE SAFETY DOORS ARE OPEN AND EVEN WHEN THE E-STOP IS PUSHED—the air does not shut off.**

Operation of the machine should be the responsibility of one operator and all other people should not interact with the controls at the monitor (which can trigger socket actuation).

NOTE: *LumenX programmers are discussed after FlashCORE.*



Installing the Socket Adapters and Actuator Plates can be done later, after setting media options in the SETUP Window.



A job can be continued later—even after clicking Finish.

Installing Adapters and Actuators on FlashCORE

To install or change a Socket Adapter on a FlashCORE programmer:

1. If a job is running, click Finish on the Run window and wait for the PNP head to empty the sockets, move to the Park position and stop.
2. Open the safety door that offers the easiest access to the target programmer(s).
3. With sockets closed (actuator up), remove the Actuator Plate by sliding it out to the left or right. Refer to the figure below.

If the programmer is between two others, one of the adjacent Actuator Plates must be in the down position (sockets open) for access. Sockets can be opened or closed with the CH700 SW.



To cycle sockets at the Gantry window:

1. Click the yellow label for your target programmer.
2. On the Actuate tab, click the Actuate Socket button to ON—the socket opens. Clicking it OFF closes the socket.



If removing all Actuator Plates in a row of programmers, start with the nearest one, and slide each plate out. (Ending a job leaves the Actuator Plates up for quick access.)

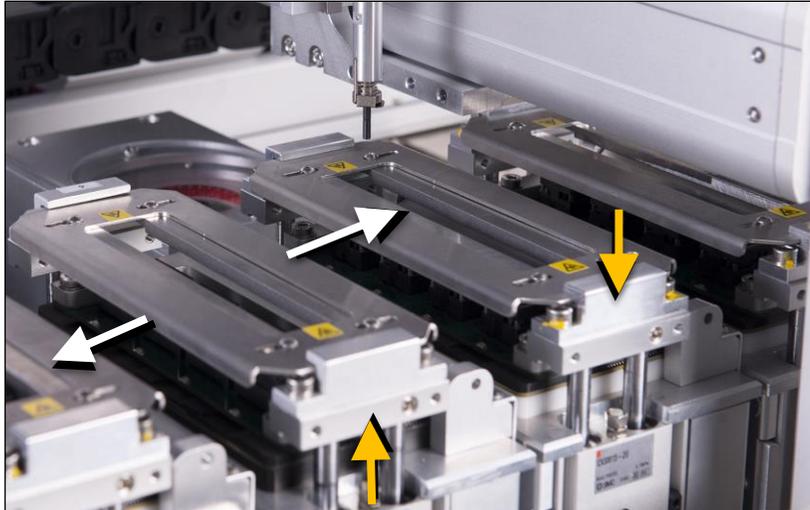


Figure 31: Remove the Actuator Plate by sliding it out from the bracket in either direction; sockets must be closed (up position). If the programmer is between two others, one of the adjacent Actuator Plates must be in the down position (sockets open).

4. Remove the Socket Adapter—
 - a. Unscrew the two captive screws with a 4 mm hex key and open the Adapter Bracket.
 - b. Lift the Socket Adapter up off the dowel pins.

NOTE: Do not touch the gold contact surfaces on the bottom of the Socket Adapter.



Figure 32: Removing the Socket Adapter from a programmer.

5. **Insert the correct Socket Adapter** for your target device, making sure that it seats on the dowel pins, then screw in the two bracket screws.

NOTE: To tighten socket adapters/boards, the recommended torque range for FlashCORE programmer screws is 1.4 – 1.5 Nm / 12.4 – 13.3 lbf-in.

6. **Install the correct Actuator Plate** by placing it into the slot on the programmer bracket and sliding in until it snaps into place. Ensure it stops at the detents.
7. See heading below—ADJUST THE ACTUATOR PLATE (unless you are using the same Socket Adapter as the previous job).

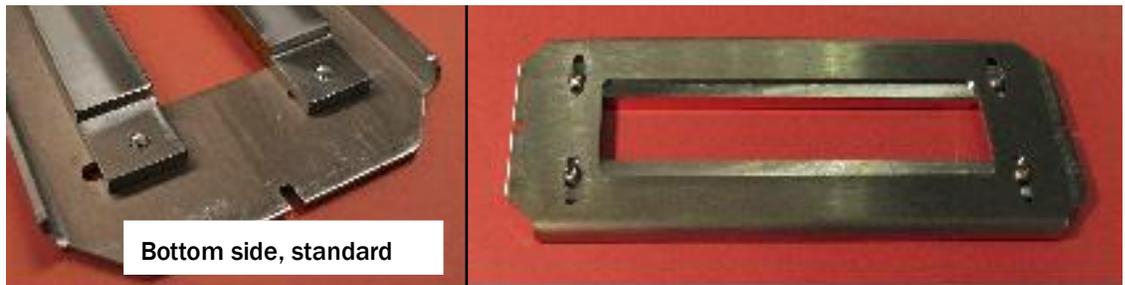


Figure 33: Standard Actuator Plate for Non-HIC Socket Adapters.

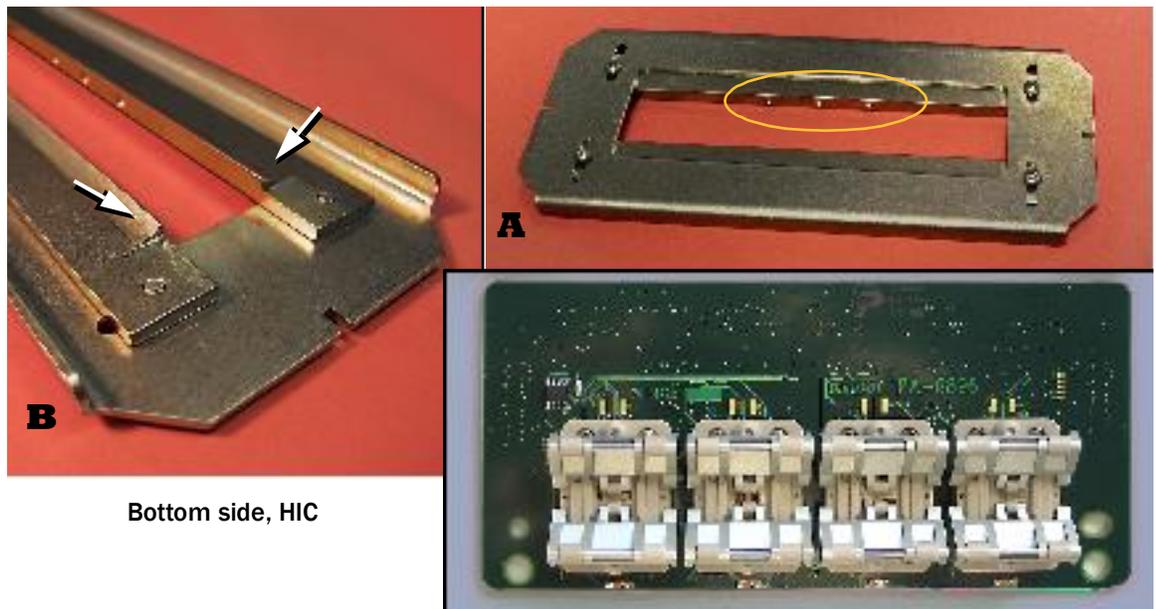


Figure 34: Special Actuation Plate for HIC (High Insertion Count) Adapters.
View A: the three dots identify HIC Actuator Plates.
View B: HIC bars have radii (arrows).

Adjusting the Actuator Plates

To adjust the Actuator Plates (both types, standard and HIC):

Requirements

- Head is parked.
- Actuator for target programmer is in the UP position (sockets closed).
- The nearest safety door is open.



To cycle sockets at the Gantry window:

1. Click the yellow label for your target programmer.
2. On the Actuate tab, click the Actuate Socket button to ON—the socket opens. Clicking it OFF closes the socket.

1. With a 2 mm hex key, loosen both screws for one actuator sliding bar and slide it inboard (toward center) as far as it will go.
2. Then slide the bar outboard just far enough to allow a device to pass through and fit into the socket. On HIC Adapters, the bars should just cover the socket rollers.
3. Tighten the two screws for that bar.
4. Perform these steps for the second bar. The bars should be symmetrical in the plate opening.
5. With vacuum tweezers, place a device into a socket to verify clearance between the bars.
6. Before running the job, (or now if the power is already on) cycle the actuator down and up to verify the setting.

Installing Adapters and Actuators on LumenX

Remove/Install Actuator Plates

To install or change a Socket Adapter on a LumenX programmer:

1. If a job is running, click Finish on the Run window and wait for the PNP head to empty the sockets, move to the Park position and stop.
2. Open the safety door that offers the easiest access to the programmer(s).
3. Remove an Actuator Plate by rotating the end with the keyhole slots to release from the fixed shoulder screws.
4. Lift that end and pull sideways (to the right) out from under the shoulder screws at the opposite end.
5. See heading below—Adjust The Actuator Plate (unless you are using the same Socket Adapters as the previous job).

Install in reverse order (ensure actuator plates all face the same direction).

NOTE: *HIC (High Insertion Count) Actuator Plates must be used with HIC Socket Adapters. HIC adapters have a radius on the underside of the adjustment bars (similar to the HIC for FlashCORE).*

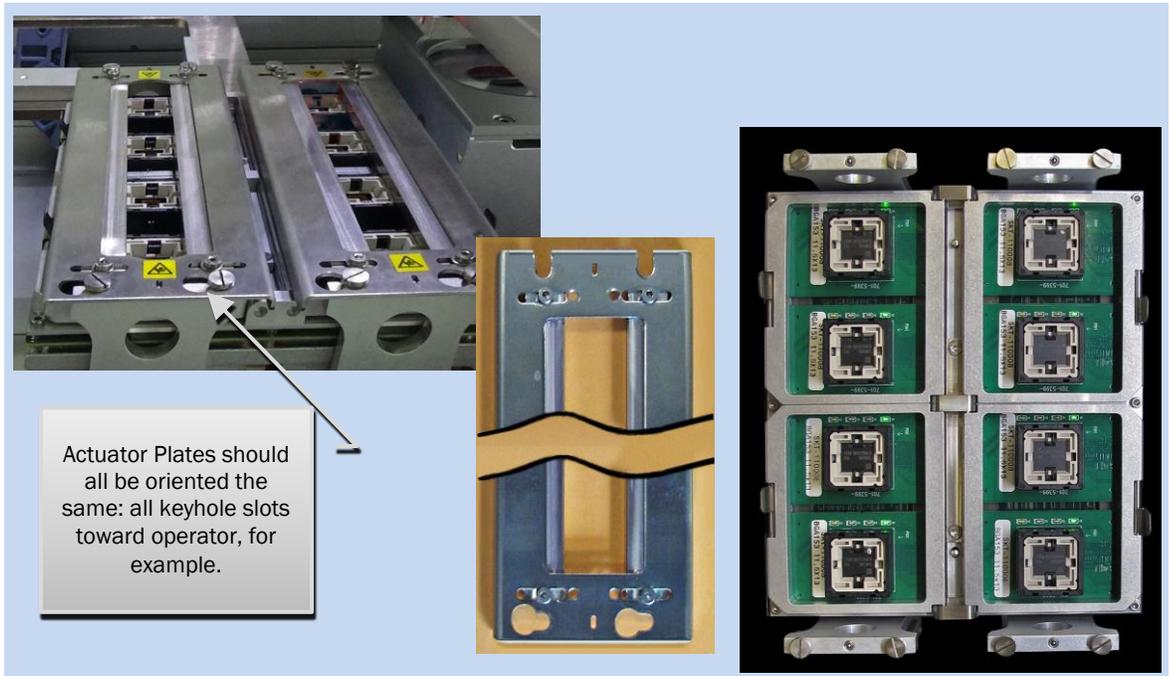


Figure 35: Actuator Plates for LumenX programmers. Shown with plates and without.

NOTE: *Actuator bar adjustments may vary depending on location—the front half of the programmer or the far half.*

Remove/Install Socket Adapters on LumenX

CAUTION:  ***Electrostatic discharge (ESD) hazard! Wear an ESD strap or discharge static against a common ground to prevent damage to Socket Adapters and devices.***

1. Pull the spring clip and lift open any socket clamp. One clamp secures two Socket Adapters.
2. Orient the Socket Adapter with the chamfered corners toward the left (when facing the front of the machine). All locations orient the same.

CAUTION:  ***Possible machine damage! Bent or damaged pins can reduce yields or prevent programming. Do not touch connector pins. Use caution installing adapters.***



Figure 36: One clamp open with a Socket Adapter installed. The chamfered corners are to the left (arrows). There is an alignment hole in each corner (two are covered by the label in this view.)

3. Place the adapter to match the guide pin at each corner with the holes in the adapter.
4. (Optional) Place a second adapter at this clamp.
5. Close the clamp. Make sure the latch snaps in place.

Removal is the reverse procedure. Lift gently by the socket.

Adjusting the Actuator Plates on LumenX Programmers

To adjust the Actuator Plates (both types, standard and HIC):

REQUIREMENTS

- Head is parked.
 - Actuator for the programmer is in the UP position (sockets closed).
 - The nearest safety door is open.
1. With a 2 mm hex key, loosen both screws for one actuator-sliding-bar and slide it to align with the socket so that it only contacts the black part of the socket body. On HIC Adapters, the bars cover the socket rollers.
 2. Tighten one screw for that bar, recheck alignment and tighten 2nd screw.
 3. Perform these steps for the second bar on this Actuator Plate.
 4. Test bar placement; with machine air off, manually press the actuator down to contact the socket body. Ensure it opens the socket correctly. Readjust the bar if necessary.

Adjust other Actuator Plates similarly as needed.

4>> Identifying the Correct Probes

Different-sized devices may require a different-sized probe tip. **For the most-reliable performance, use the largest nozzle/rubber cup outer diameter (O.D.) possible for the target device** so as to create optimal vacuum suction and ‘blow-off’ air when picking and placing devices.

NOTE: For tip sizes not listed, refer to the original manual that came with your PSV5000. The older tips can be used with the new holders.

Pictured Right:

Basic components of a probe assembly on a PSV5000 pick-and-place (PnP) head.

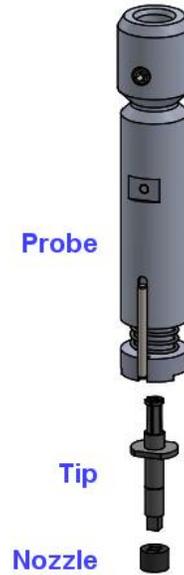


Figure 37: Probe Assembly.

To identify the correct tip assembly for your application:

1. First select the largest **Nozzle** for your device, based on outer diameter. The following table lists available nozzles and part numbers.

Tip OD (mm)	Part Number	Probe Tips (No Nozzle)
1.3	646-0167-001	NOZZLE,PROBE TIP,1.3MM x 0.9MM CUP,HITACHI HVO3,PSV
Tip OD (mm)	Part Number	Nozzles for 1.9mm Square Holder
1.75	288-0014-001	VACUUM,CUP,1.75MM OD,FOR 1.9MM TIP,PSV
2.25	288-0013-001	VACUUM,CUP,2.25MM OD,FOR 1.9MM TIP,PSV
3.05	288-0040-130	VACUUM,CUP,3.05MM OD,FOR 1.9MM TIP,PSV

Tip OD (mm)	Part Number	Probe Tips (No Nozzle)
3.56	288-0040-135	VACUUM,CUP,3.56MM OD,FOR 1.9MM TIP,PSV
4.06	288-0040-140	VACUUM,CUP,4.06MM OD,FOR 1.9MM TIP,PSV
4.57	288-0019-001	VACUUM,CUP,4.57MM OD,FOR 1.9MM TIP,PSV
5.08	288-0040-151	VACUUM,CUP,5.08MM OD,FOR 1.9MM TIP,PSV
Tip OD (mm)	Part Number	Nozzles for 2.7mm Square Holder
6.1	288-0040-206	VACUUM,CUP,6.10MM OD,FOR 2.7MM TIP,PSV
8.1	288-0040-208	VACUUM,CUP,8.13MM OD,FOR 2.7MM TIP,PSV
10.2	288-0040-210	VACUUM,CUP,10.16MM OD,FOR 2.7MM TIP,PSV
12	288-0040-212	VACUUM,CUP,12.00MM OD,FOR 2.7MM TIP,PSV

Notes:

- A. Nozzles are consumable parts, which deteriorate from use. Replace a nozzle if it has cracks or is unable to hold vacuum pressure.
- B. The 1.3mm probe tip does not use a nozzle.



Figure 38: 1.3 mm probe tip requires no nozzle/cup.

- C. For all other outer diameters, the nozzle has a mounting square/hole that slides onto the probe tip.



Figure 39: Mounting square for nozzles.

- Now select the appropriate **Probe Tip** (based on your selection of the optimal nozzle in Step 1). All of the tips have only 1 of 2 different mounting squares: 1.9 or 2.7 mm.

Part Number	Probe Tips	Square Size (mm)
6460171001	HOLDER, RUBBER TIP,1.9MM SQUARE,PSV	1.9
6460172001	HOLDER,LARGE RUBBER TIP,2.7 MM SQUARE,PSV	2.7

6460171001 (ProbeTip 1.9mm Square)



6460172001 (ProbeTip 2.7mm Square)



Figure 40: Different-sized probe tips.

- Lastly, select the appropriate **Probe** (Tip Holder) for your device.

Probes	
6150321002	ASSY,CLIPLESS TIP HOLDER,PNP,PSV

Removing and Installing the Probe



CAUTION: *Safety hazard! Possible personal injury from moving machinery. Always make sure that the PNP head is stopped in the Park or Tool position before opening any access doors.*

- Pause or Finish a job if one is running.
- At the Gantry window, click the Tool position to move the head to the Tool position for easy access.



Figure 41: [Left] At the Gantry window, the Tool label has been clicked.

3. Open the safety door.



WARNING: Shock hazard! Opening the safety doors stops motion of the gantry only. It does not remove electrical power from the machine or any optional equipment.

Turn the main power OFF for safety unless otherwise directed.

4. Push the head assembly down for access to the probe.
5. IF A RETAINING CLIP IS PRESENT: Pull the Retaining Clip out, away from the probe grasping it opposite the thin aligning pin.

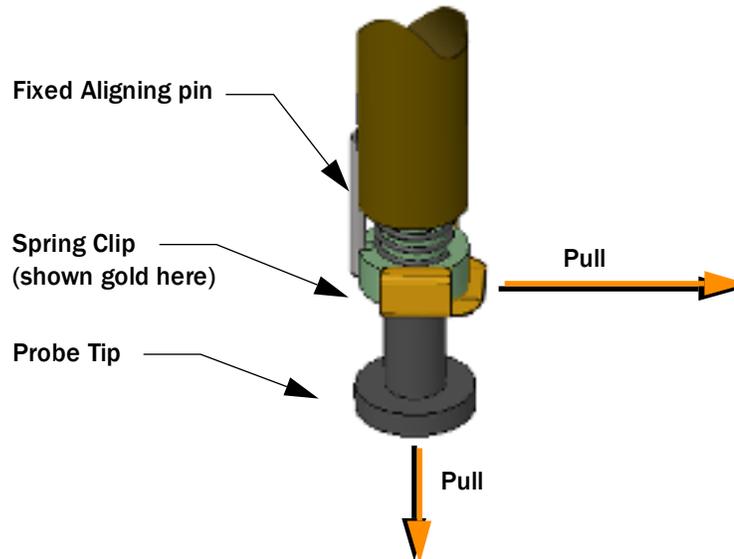


Figure 42: If a Retaining Clip was used, remove the Spring Clip from the probe prior to pulling off the tip.

6. If a Retaining Clip was used, remove it and pull down on the probe tip to pull it off the probe holder.
7. Referring to the PNP Head Probe Tips table on page 38, select the correct probe tip, or tip + nozzle. Assemble as required by pushing the nozzle onto the square at the end of the tip.
8. Insert new probe, aligning the oval flange with the slot in the probe base.

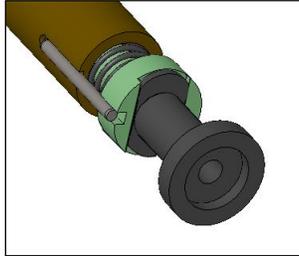


Figure 43: The tip must seat in the slot in the holder. The Spring Clip has not been installed yet.

9. (Optional but suggested) Insert the Retaining Clip, pushing it on making sure the aligning pin doesn't interfere.
10. Make sure the tip is clean.
11. Still at the Gantry window, click Park.



Flat on the stem

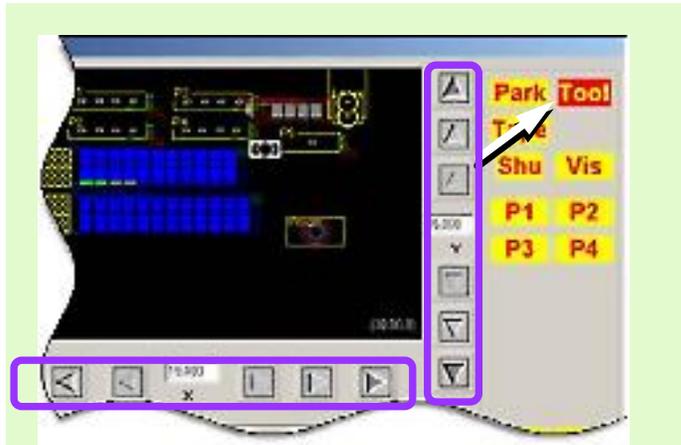
Removing the Probe Holder

If you ever need to remove and replace the probe tip *holder*:

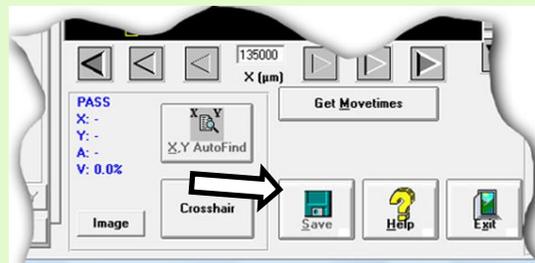
Tools Required: 1.5 mm hex key.

1. Perform steps 1–4 above for removing a probe.
2. Rotate a probe so the set screw is accessible and remove the set screw with a 1.5 mm hex key.
3. Pull the Probe Holder off the stem. Note that the stem has an O-ring and it should stay in place.
4. Insert the appropriate holder for your application with the set screw hole lined up with the flat on the stem. Push the holder all the way up.
5. Install and tighten the set screw.

How to Teach a new TOOL Position



1. Click the Tool command in the Gantry window (white arrow).
2. Click any of the Arrow buttons (circled in purple) to move the head to a desirable new Tool position.



3. Click Save.



5>> Installing the Correct Laser Shuttle Tips

For jobs that use the laser marking option with tray output only, a laser shuttle is used and the vacuum tips must be of adequate size for the vacuum to hold the device. Devices with flat bottoms such as QFP, TSOP, and SSOP require tip diameters smaller than the shortest edge of the device. The tips supplied on the machine generally work for most devices. If you need different tips, follow the steps below.

REQUIREMENTS:

- No job is running.
- 1 mm hex key
- Machine power will need to be turned OFF.

To remove and install Laser shuttle tips:



CAUTION: *Safety hazard! Ensure that the laser motor is disabled with the Access Cups command. Use caution*

1. If the PNP head is near the Laser shuttle, move it to the Park position. (Click RUN window > Park)
2. Open the rear safety door.
3. Unscrew each exposed tip with a 1 mm hex key in the center of the tip, and lift each tip out.

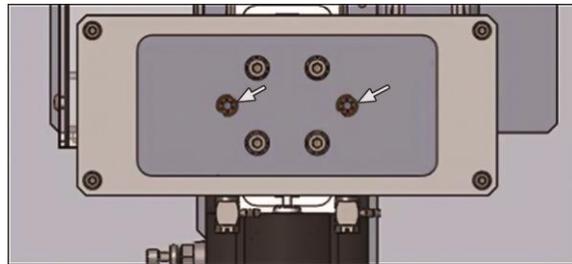


Figure 44: A one mm hex key fits into the center of the each laser tip (arrows) to unscrew it.

4. Screw in the two new tips.
5. Close the safety door.

6>> Running the Automatic Tray Feeder



The Automatic Tray Feeder, called TF-35, delivers one tray to the workspace.

For more information see the *Tray Feeder System User Manual* that came with your system.

There is an automatic Tray Feeder option available for the PSV5000 System. Chapter 2 of the Owner's Manual discusses setting it up. This Chapter 6 provides an Operational overview of the Tray Feeder and steps for initializing and running it.

Under normal operation, the Tray Feeder behaves as follows after setup:

- A. When running a job, the Tray Feeder moves a device tray from the Input stack to the Tray 1 location (because Tray 1 is located within the PSV5000 interior workspace, accessible by the PnP head).
- B. Gantry hardware and CH700 software handle the PnP movement of blank devices from Tray 1 to Programmer(s), then back to Tray 1.
- C. Finally, the Tray Feeder moves the tray of programmed devices from the Tray 1 location to the Output stack.

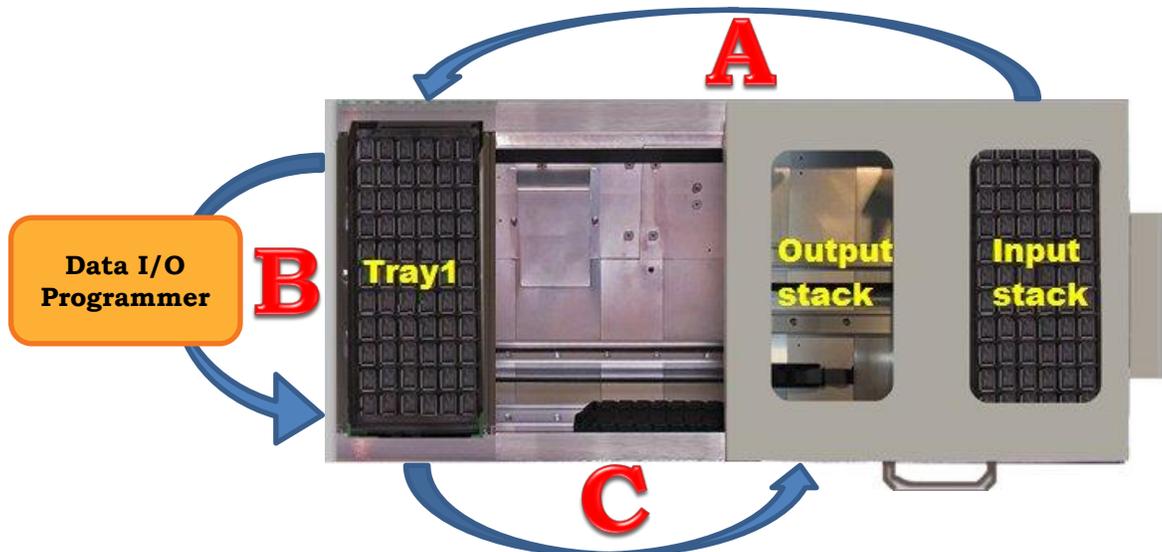


Figure 45: Normal operation of Tray Feeder.

Between jobs, always reset the Tray Feeder to clear any remnant settings:

- Initialize the Tray Feeder using the TrayFeederUtility (**C:\CH700\TrayFeeder\TrayFeederUtility.exe**)
- Then Cycle the Tray Feeder using CH700 (**System > Misc I/O > AutoTray** tab)

At the start of each job (with the loading of new trays), remove any devices from the shuttle elevator tracks. **Ensure all Tray Feeder motion is stopped** (ex. **Pause** or **End** the job) before accessing the shuttle elevator tracks for maintenance, such as cleaning or wiping.

Power Up the Tray Feeder

1. Ensure the *Tray Feeder 35* utilities are plugged into the PSV5000 Machine and the Tray Feeder power switch is in the ON position. The Tray Feeder powers up when the PSV5000 Machine is started.
2. To verify power, ensure the top sensors have lights (indicating power).

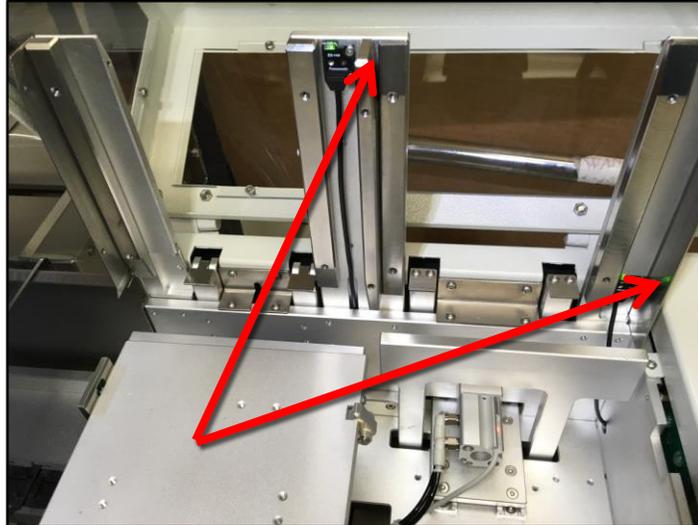


Figure 46: Verify sensor lights.

Verify Tray Feeder Initialization

1. Install up to 20 JEDEC trays of unprogrammed devices into the *Input Stack* of the Tray Feeder.
2. Run your job in TaskLink or LumenX Data Management Software.
3. After CH700 starts, click the In and Out buttons to enable Tray 1 for Input and Output.

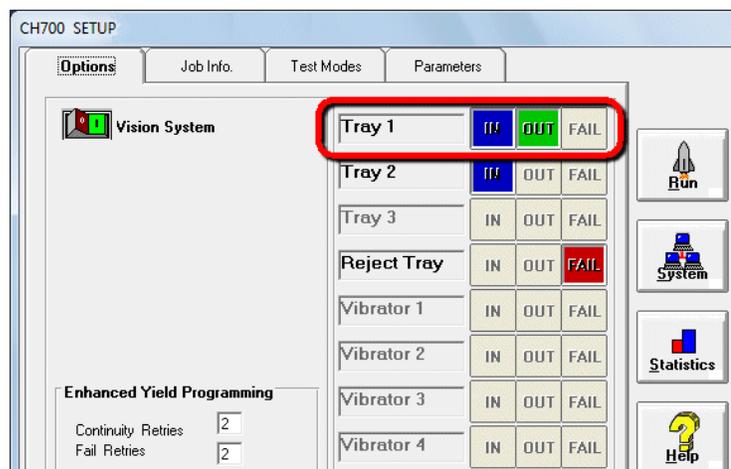


Figure 47: Enabling Tray 1 for Input and Output.

4. In the right pane, click System, and enter the Supervisor password.

Teaching the Tray 1 Location

1. In the CH700 Setup window, click System (in the right pane).
2. In the System window, click Gantry.

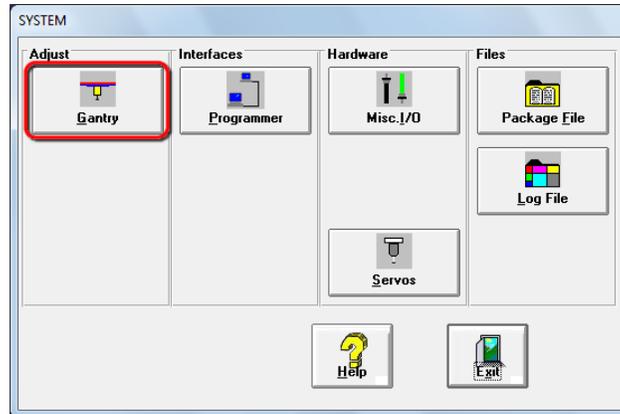


Figure 50: Click 'Gantry' for handler functions.

3. In the Gantry window, click Tr1 to move PnP head to the Tray 1 location.

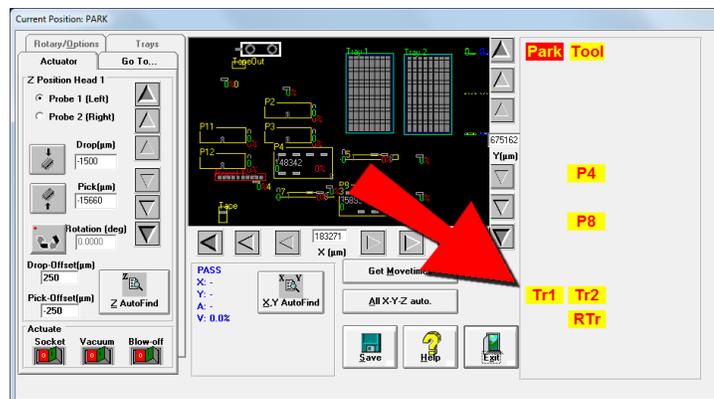


Figure 51: Click 'TR1' to move PnP head to Tray 1 location.

4. Center Probe 1 over the device (use X and Y adjustment arrows), and then click Z AutoFind.

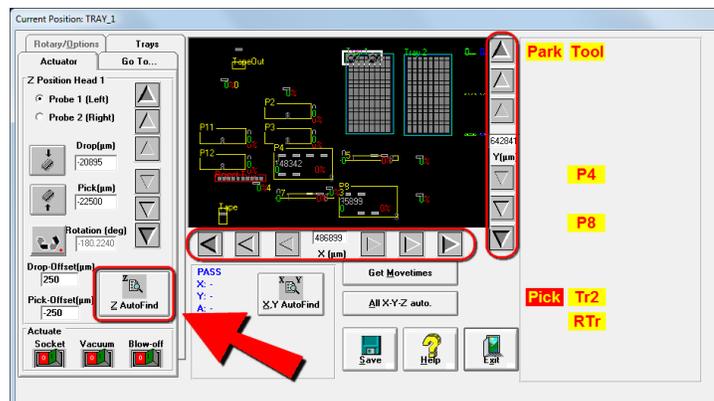


Figure 52: Click 'Z AutoFind' to teach the vertical height.

5. If you see the confirmation dialog box about overwriting previous values, click Yes to continue.
6. Now click X,Y AutoFind.

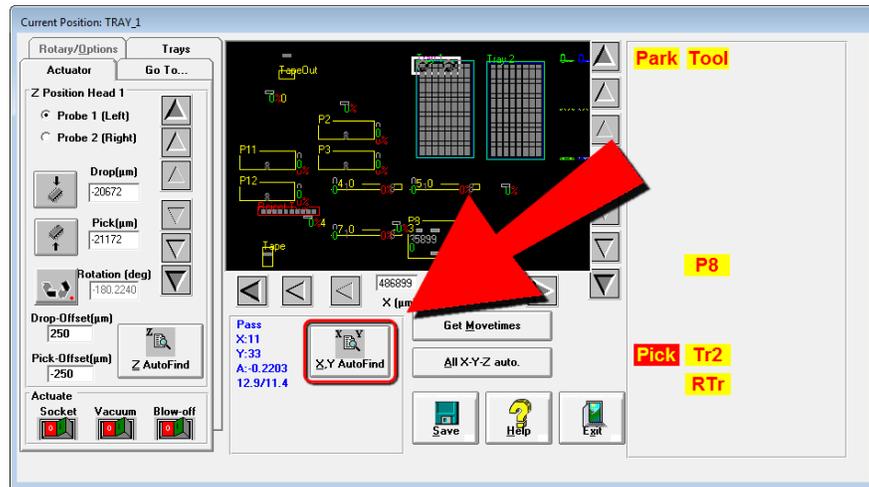


Figure 53: Click 'X,Y AutoFind' to teach the horizontal position.

7. If you see another confirmation dialog box about overwriting previous values, click Yes to continue.
8. Near the bottom-middle section of the Gantry window, click Save.
9. Now click the Trays tab, set the Dimensions for Tray 1 (number of devices per column and row), and then click the Diagonal Corner button.

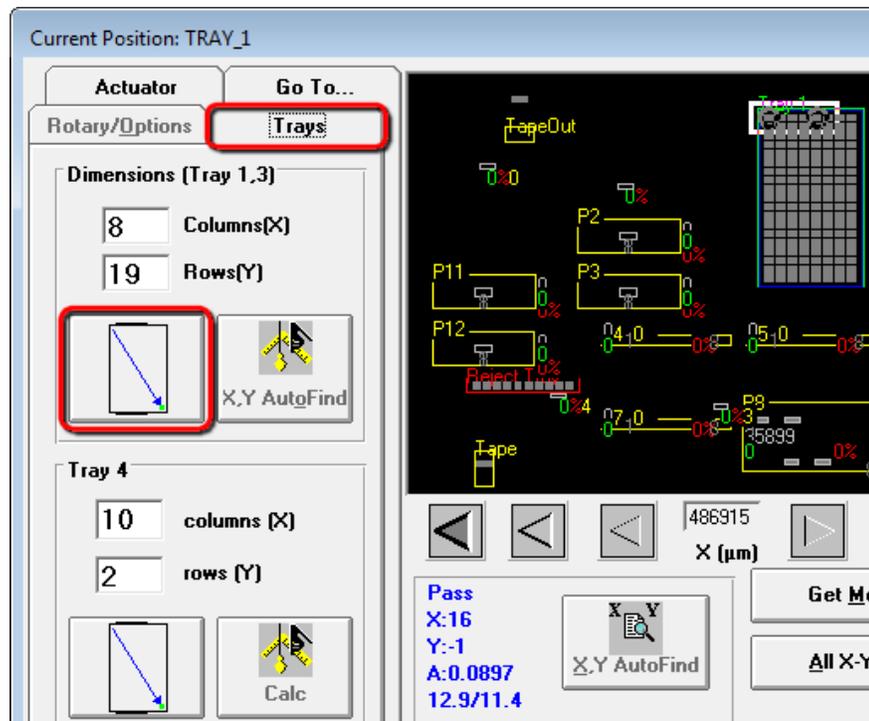


Figure 54: Setting the dimensions for your specific tray/device.

10. After PnP head moves to opposite corner of the tray, click X,Y AutoFind.

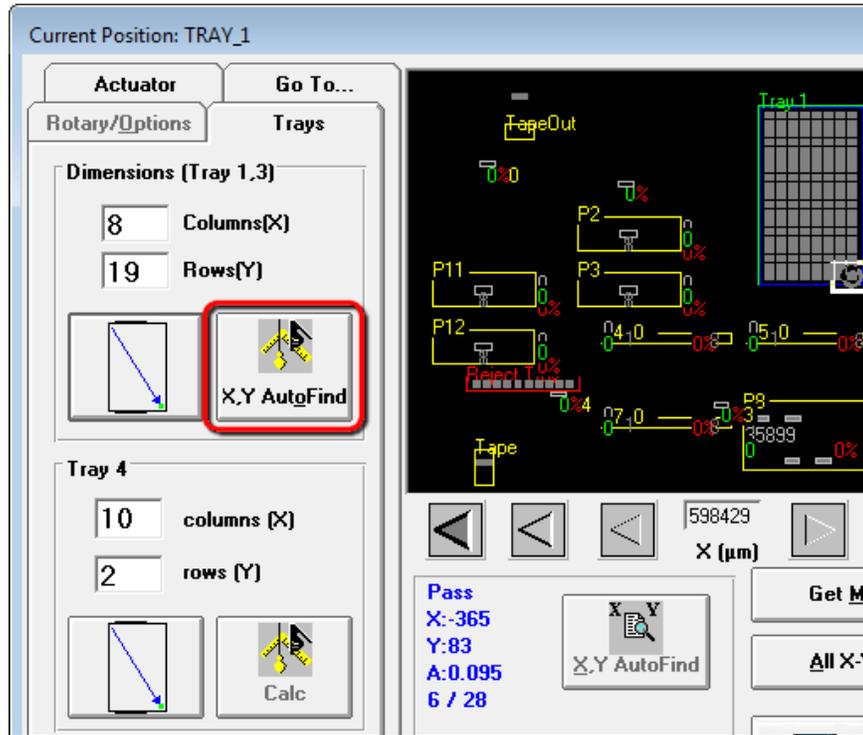


Figure 55: Click 'X,Y AutoFind' again to teach the opposite corner.

11. If you see another confirmation dialog box about overwriting previous values, click Yes to continue.

The Tray Feeder is now ready for job operation.

7>> Turning PSV5000 System Power ON

Before you turn on power, check that:

- All safety doors are closed
- The external air line is connected, the air pressure switch is in the ON position, and the pressure indicator number is green.



CAUTION: *Possible hearing loss hazard! Generally, Data I/O's offline programming systems do not exceed 85 dB. Installing optional equipment may raise the sound level slightly. Hearing protection is recommended if the noise level in your environment exceeds 85 dB.*



For location of the main power switch, see page 3.

1. Turn the power ON (at the back of the machine) by rotating the large switch to the ON position.
2. Make sure the air line is connected and then turn the air pressure switch ON. Make sure the pressure indicator number is green.



NOTE: *Turning power ON does not start CH700 (the PSV5000 automated handler software). Although the CH700 icon on the monitor can be double-clicked, you should start the application within the context of a job: first start TaskLink or LumenX Data Management Software (DMS).*

8>> Selecting a Job—Starting CH700

TaskLink (TL) and LumenX Data Management Software (DMS) automatically start CH700 Application Software when Run is clicked.

- TaskLink is Data I/O's software for creating programming jobs and setting programming options for FlashCORE programmers, but also for selecting jobs and starting CH700 to run them. Jobs created with TaskLink cannot run on LumenX programmers.
- LumenX Data Management Software (DMS) is Data I/O's software for creating LumenX programming jobs and setting programming options, but it can also be used for selecting jobs and starting CH700 to run them. Jobs created with LumenX DMS cannot run on FlashCORE programmers.

CAUTION:  *Possible touchscreen damage! Hard objects such as pencils and pens can damage the screen. Use fingers only.*

NOTE: It is NOT necessary to restart programmers between jobs.

To select and start a job for FlashCORE Programmers

1. At the touchscreen, double-click the TaskLink icon.



Figure 56: TaskLink icon



If CH700 is already running and you are rerunning the same job, click Run in the Run window—no need to restart CH700.

2. Open Task Manager, select your Task from the list, and click Run.

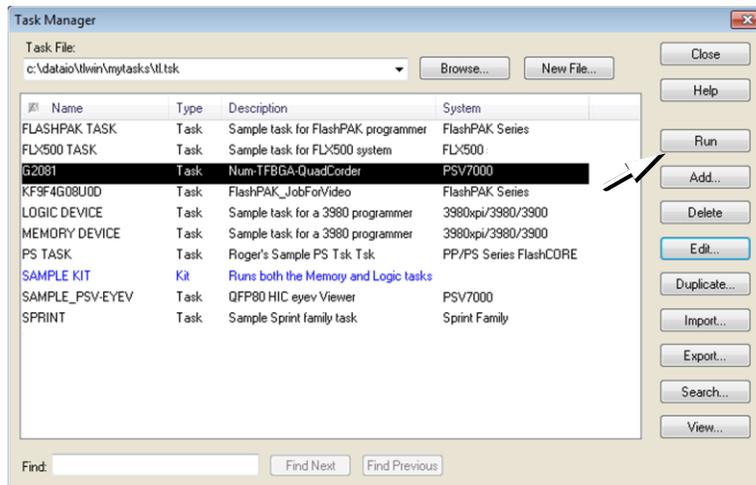


Figure 57: Select a Task and click Run to run a job on PSV5000.

3. A Footnotes Dialog displays. **Take note of the Socket Adapter and Actuator Plate part numbers required.** Click OK to close the dialog.
4. (Optional) Enter the number of devices to be processed in the Pass Limit field (0 is the default for an unlimited number of devices).
5. (Optional) Enter a description.
6. Click OK.



Figure 58: Both a pass limit and a description are optional.

7. When job setup is complete, TaskLink confirms launching the CH700 software and displays the calculated checksum (if *Display Checksum* option is checked in TaskLink). Click Yes.

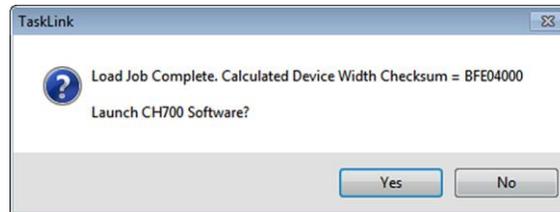


Figure 59: Click 'Yes' to launch CH700 Software.



Figure 60: The CH700 Main window for the PSV5000 opens with a job loaded and job name displayed (arrow).

To select and start a job for LumenX Programmers



1. Double-click the LumenX Data Management Software icon.
2. Click your job name. If no jobs display, see the on-screen Help for pointing LumenX to the correct directory.
3. Click Select.

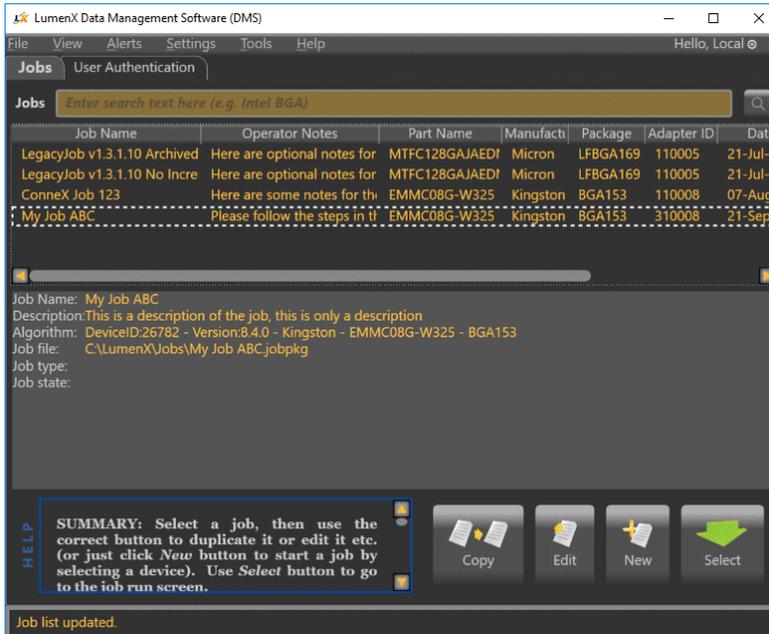


Figure 61: In main window, selected job is outlined in a box.

4. Check the desired programmers (left column).

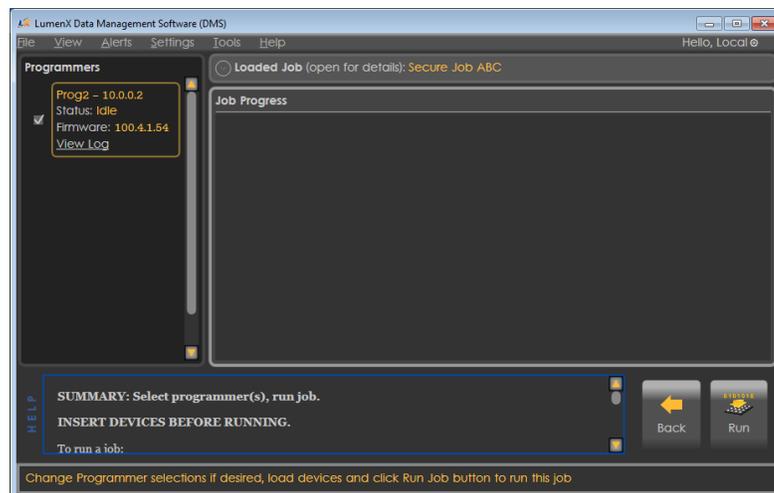


Figure 62: Programmer is selected in Run window.

5. (Optional) View job details by clicking the Loaded Job drop-down arrow.

NOTE: *LumenX DMS must be in PSV Mode for it to open CH700 (Settings > Settings, set Presenter Mode to PSV Mode).*

6. Click Run.

Both TaskLink and LumenX Data Management Software open CH700.



Figure 63: The CH700 Main window opens with a job loaded.

9>> (Optional) Preselecting Programmers

The PSV5000 can be configured with up to six FlashCORE programmers, five LumenX programmers, or a combination of the two.

For efficiency, shut off programmers that are not used for a particular job:

1. At the CH700 Main window, click Preselect Programmers. Refer to Figure 64: below.
2. Click **I** (green side) of the Unlock Cnf button to allow changes.
3. For each programmer, click **I** (green side) of the button to enable it or the **O** (red side) to disable it.

NOTE: *If a programmer does not have a Socket Adapter, or an incorrect Socket Adapter is installed, the programmer will automatically be disabled.*

NOTE: *It is NOT necessary to restart programmers between jobs.*

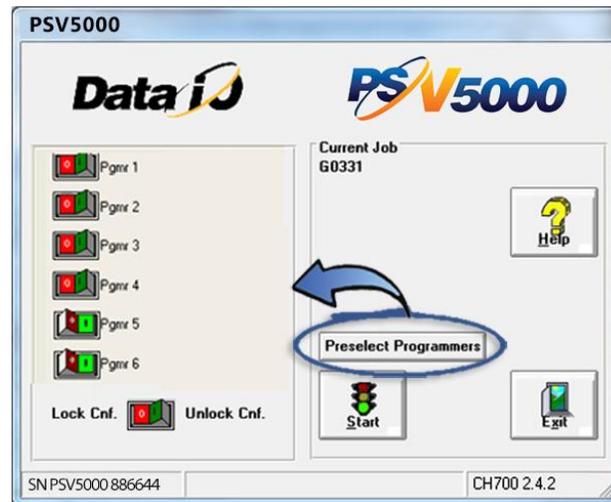


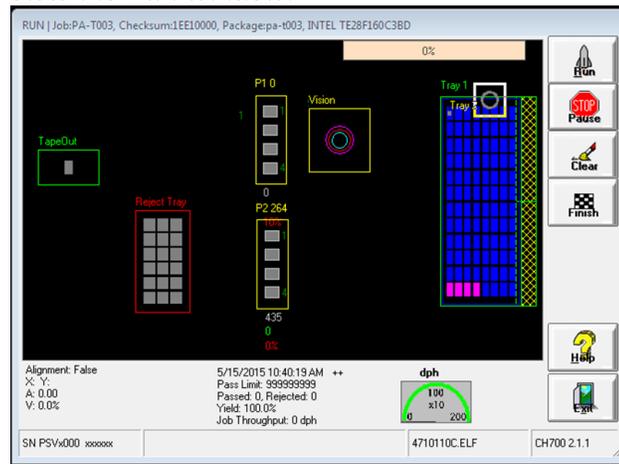
Figure 64: Preselect Programmers has been clicked. In this image, programmers 1 through 4 are disabled.

4. Lock the configuration again **only if you wish to keep this setting the next time the system is turned on** by clicking the O (red) side of the Lock Cnf button.

10>>Setting Media and Options—the Setup Window

1. On the CH700 Main window, click Start.
2. On the Options tab of the Setup window, select the desired Input, Output, and Reject media.

NOTE: *If using the Tray Feeder, set Tray 1 to IN or IN and OUT as desired. The Setup > Options window may not distinguish between Tray 1 and Auto Tray. To confirm that the winah400.ini file is set to Auto Tray, view the Run window.*



Yellow hatch marks for Tray Feeder indicator.

3. (Optional) For laser marking devices, turn the Laser Marking key-switch to ON (clockwise). Ensure the correct laser shuttle tips are installed.

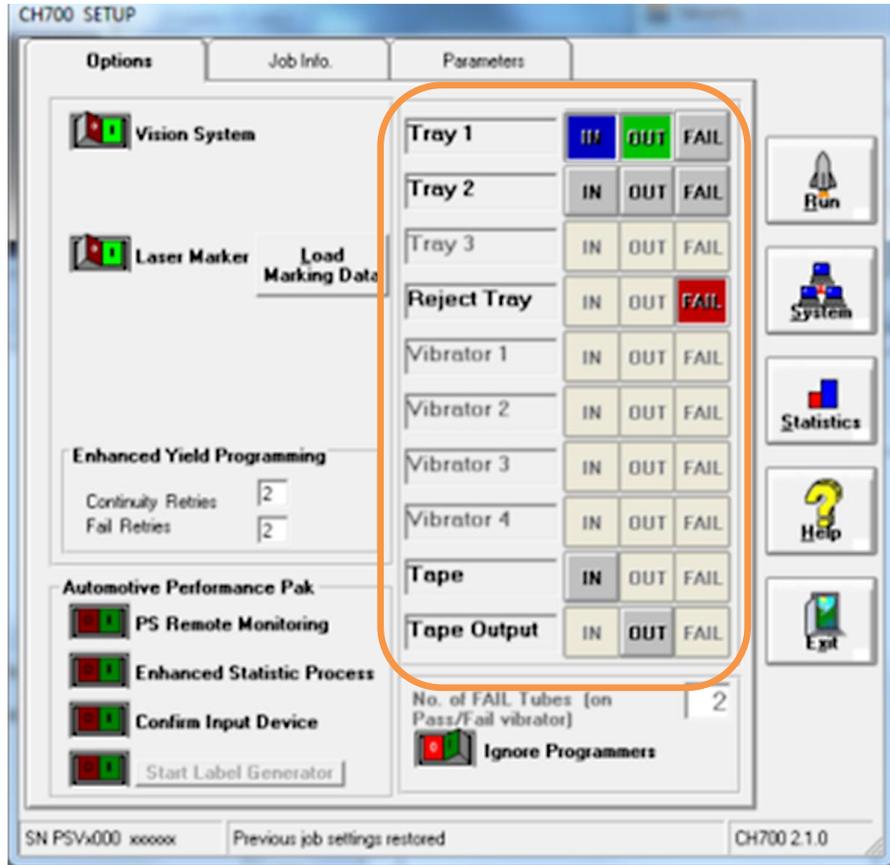


Figure 65: The **SETUP** window requires selections for input, output, and reject media on the **Options** tab. Only options set in the **WinAH400.ini** file will display. Common setups will not display all the optional features that are shown here. Talk to your Administrator regarding desired options that are not displayed.



For Enhanced Yield option settings, you should confer with your administrator.



For more information on the AP Pak, see the CH700 on-screen Help.

4. Set Enhanced Yield Options:
 - a. (Optional) In the Continuity Retries field, enter the number of times the system should retry continuity failures before rejecting the device.
 - b. (Optional) In the Fail Retries field, enter the number of times the system should retry programming failures (excluding over-current and continuity) before rejecting the device.
5. **[Automotive Performance Pak Option only]** (Optional) Start any of the five utilities available with the AP Pak. NOTE that you may not have security rights to change these options. Check with your administrator.
6. Make sure Ignore Programmers is Off (red). If it is On (green), the PNP head will not stop at the programmers and will effectively transfer devices from input media to output media with no programming, and with or without laser marking. The default is Off.

NOTE: If your desired input media (tape or tray) does not display on the *Options* tab, the *winAH400.ini* file may need to be edited. See the online *Help* for instructions editing the *WinAH400.ini* file or contact *Data I/O Customer Support* or a local *Data I/O approved service representative*.

Verifying Media Setup

1. At the Setup window, click the Job Info tab.
2. Verify that all the information displayed for this job is accurate.

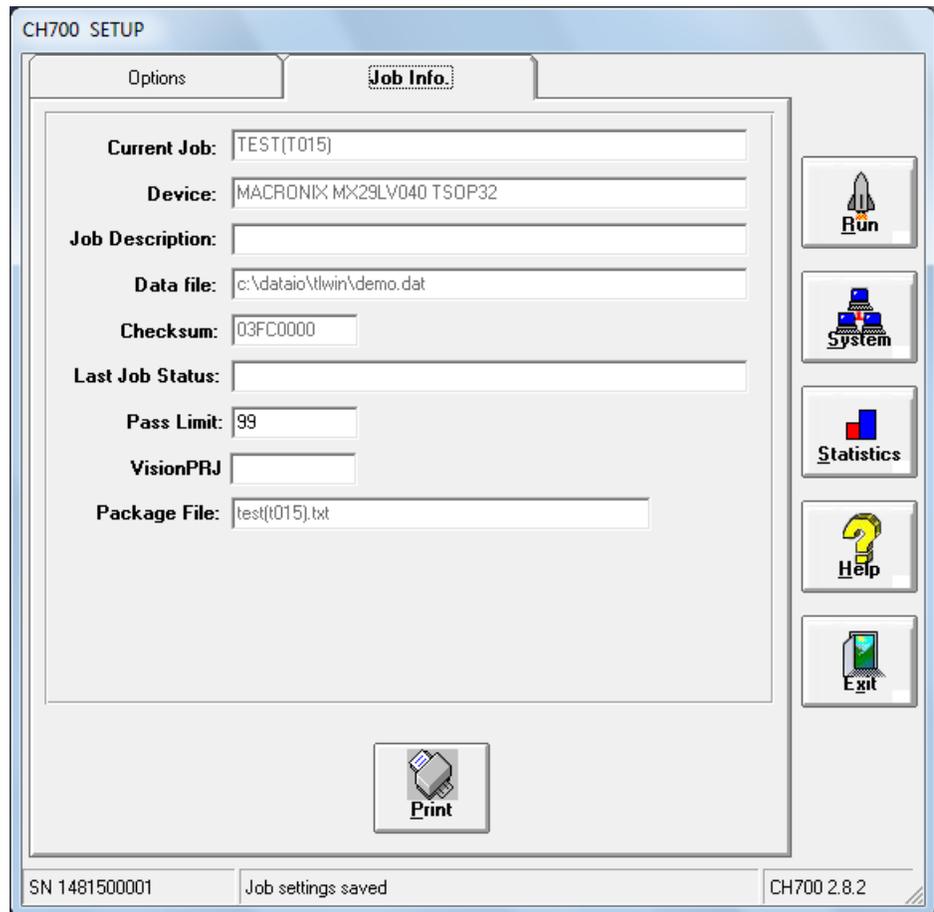


Figure 66: The Job Info Tab is a read-only review of information, with the exception of the editable Pass Limit field.

3. (Optional) Change the Pass Limit (number of devices to program)—At the Job Info tab, click the in Pass Limit field and enter the new Pass Limit value and click OK.

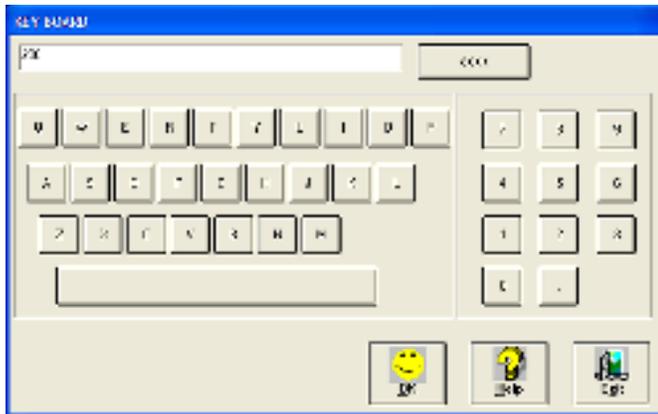


Figure 67: The Keyboard dialog opens after clicking in the Pass Limit field. The <<<< button erases the right-most digit. Exit cancels any changes.



CAUTION: *Possible socket and device damage! If an incorrect Package File was selected during Task creation, or if device orientation was input incorrectly, devices or socket contacts may get damaged. If you have any doubts about the Package File, contact your system administrator.*

Aligning the Tape-Input Pick Point

If tape feeder input is used, align the pick point; see page 20 for more.

11 >> Starting Programming

After setting up the machine hardware and input/output media and options, the job is ready to be run.

NOTE: *Prior to starting a job, make sure there are no devices in the programmers. See [Removing Devices](#) on page 64.*

If this job uses laser marking and the marking file has not been set in the job, see [TaskLink Help](#) or contact your administrator.

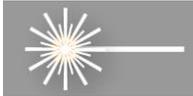
*It is **NOT** necessary to restart programmers between jobs.*

1. If this job uses laser marking, make sure the Laser PC is On and the Marking Head is ready. Refer to the next heading below before continuing.
2. At the Setup window, click Run.
3. On the Run window, click Run.
4. Click OK to the message notifying that Tray 1, Tray 2, and Fail Tray have been found.

The PNP head begins its movements. The Run window tracks head movement (white square), and displays device placement. Socket status indicators appear inside the programmer outlines.



For more about the live data on the Run window, see the CH700 on-screen Help.



Laser Marking

If a job uses laser marking, the laser PC must be started as described below.

Laser Safety

The laser marking system operates as a Class 1 laser system, with a class 4 embedded laser (CDRH classification), and therefore uses integrated interlocks to prevent the laser from firing while any cover is open. The laser should never be operated without safety covers in place. Observe all warnings regarding laser usage.



WARNING: **Eye damage and burn hazard!**
The laser marker uses a class IV laser which emits invisible infrared light. The invisible infrared light can cause third-degree burns even when defocused.
The output beam also produces visible and invisible radiation harmful to eyes. Personnel around the equipment must always wear safety protective glasses of correct wavelength.

Starting the Laser PC



To extend the service life of laser, turn it OFF if it won't be used for a long time after operation.

1. Ensure the power to the laser PC is ON. Blue light is on.



Figure 68: Laser Power Control Box.



For more laser marking information see one of the following:
The PSV5000 Owner's Manual, or
The UpperHand Laser manual, or
The MarkingMate Application Help

2. Rotate the emergency stop button to the *not-stopped* (out) position.
3. Turn ON the Key-switch (clockwise).
4. Activate the red light output (for the reference aiming laser) by turning ON [I] the RED LIGHT switch.
5. Turn on the galvanometer SCAN switch to activate the driving source for optical scanning.
6. Start the fume extractor; see the next heading below.
7. Start laser marking.
TaskLink loads the marking file set in the job file.

To stop the laser at any time, push the small Emergency stop button on the laser control panel.

NOTE: A marking test can be performed using the RunOne button on the Run window.

Starting the Fume Extractor



WARNING: Health hazard! Laser marking generates vapors, fumes, and particles that may be noxious, toxic, or even fatal.

Ensure that the fume extractor is running when laser marking devices and that there is adequate ventilation in the room.

NOTE: *The Fume Extractor must run when using the Laser marker.*

If for some reason the Fume Extractor is not running, follow the steps below to turn the Fume Extractor power ON.

To manually start the Laser Fume extractor,

1. Turn the PSV5000 power is OFF. Refer to *Turning Power OFF* on page 74.
2. Open the front lower access door.
3. Turn the fume extractor power ON.

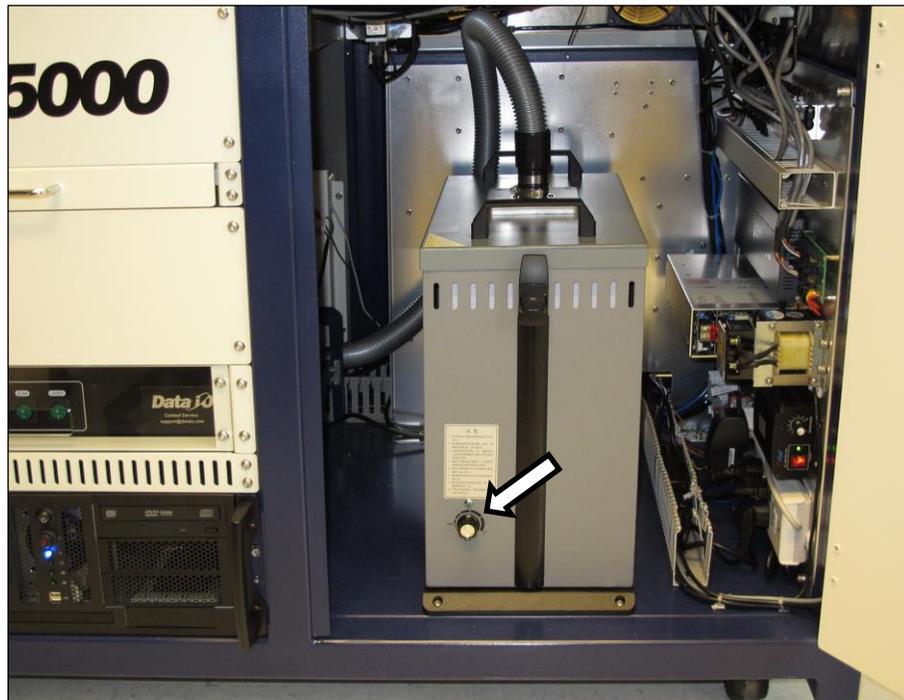


Figure 69: Fume Extractor Power Switch.

4. Close the access door.

Close all safety doors and turn the PSV5000 System power ON.

Removing Devices

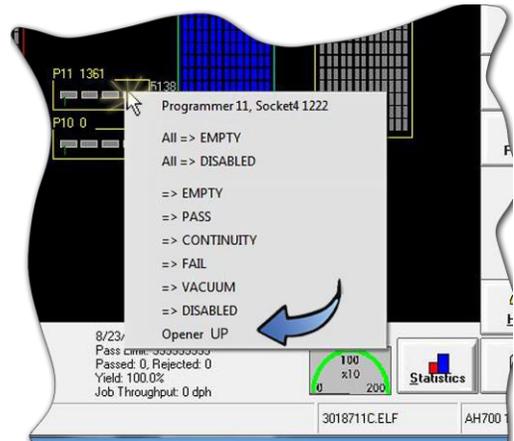
Remove unwanted devices in programmer sockets by:

Manually

1. Pause or Finish (end) a job.
2. Right-click on the desired programmer to open a submenu, and then click Opener UP.
3. Using ESD precautions, open a safety door and remove the devices with a vacuum tweezer.

At the Run Window

1. Pause or Finish (end) a job.
2. Click Clear. Device will be moved to the reject media.



Stopping the System

There are three methods for stopping the machine:

- **Emergency Stop**—Pushing any of the red E-Stop buttons stops the movement of the PNP head immediately in an emergency. (Power to the gantry motors is disconnected and communication to the Laser head is disconnected.) The CH700 Application must be closed and the job re-started in TaskLink.
- **Pausing a Job**—Clicking Pause in the Run window—stops the PNP head at its next destination. Devices finish programming if started but are not removed from sockets. The programming session can be continued.
- **Finish a Job**—Clicking Finish in the Run window—stops picking blank devices, finishes the current programming cycle, and removes devices from all the sockets placing them into appropriate media. The programming job can be resumed.

NOTE: Job throughput as displayed in the Run window is affected by the length of time a job is paused. Nominal throughput excludes paused time.

Emergency Stop

To prevent bodily injury or damage to equipment in an emergency, press the red Emergency Stop (E-Stop) button located on the front and back of the machine. Pressing an E-Stop button immediately stops motion of the PNP head and the gantry.



WARNING: **Electric shock and collision hazards!** Personal injury or machine damage can result if the Pause button is used for emergencies. In an emergency, do NOT use the on-screen Pause button to turn OFF power. **PRESSING PAUSE DOES NOT REMOVE POWER to the system (instead, press the Emergency-Stop button).**



Figure 70: There are two Emergency Stop (E-Stop) buttons: on left near front, and on right near back of the machine

To restart the System

—after pressing an E-Stop

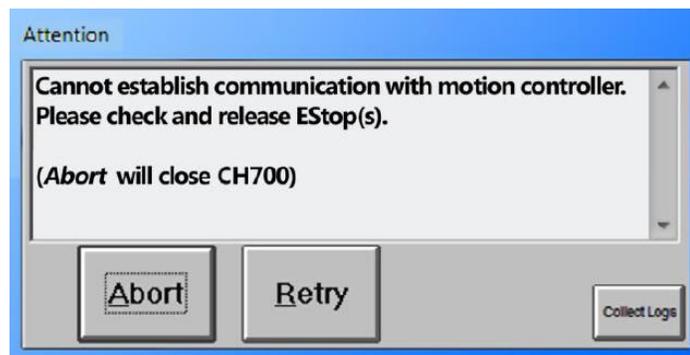


Figure 71: Popup message: Check the E-Stops.

1. Rotate the E-Stop button clockwise until it springs back to its full height. Check the second E-Stop button if necessary.
2. Click Retry to continue. If possible the system will re-establish communication within 30 seconds.

If it fails, then click Abort to close the CH700 application.

3. Reselect the job in TaskLink and click Run.

Pausing a Job

To pause a job (stopping the Gantry) click Pause on the Run window. Devices being programming will finish programming. This is the preferred method for pausing the system in a non-emergency situation.

CAUTION:  *Personal safety hazard! Do not open safety doors until all movement of the machine has stopped.*

To resume, click Run. Refer to the figure below.

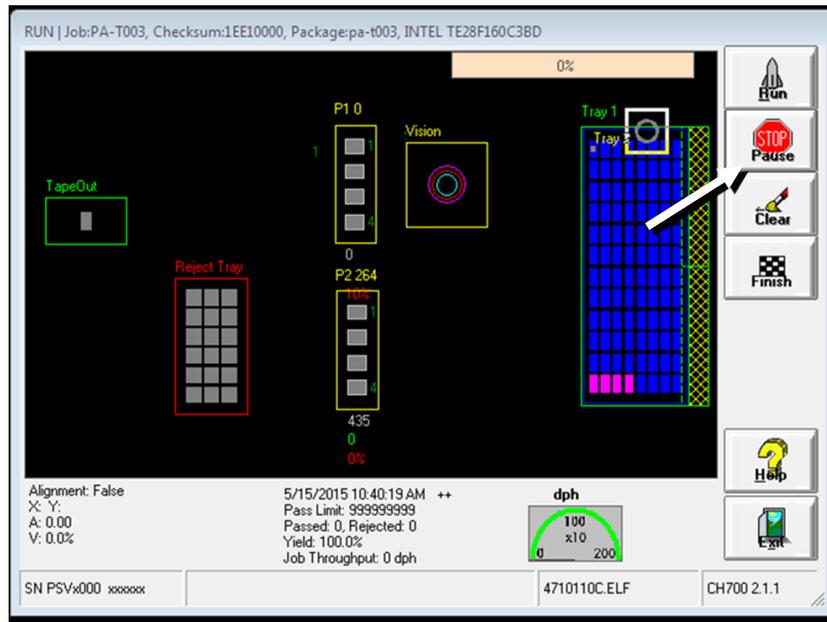
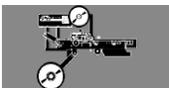


Figure 72: The Run window. Click Pause to stop a job you wish to continue next. After clicking Pause, the Tower Lamp changes to yellow.



NOTE: *When restarting a job that uses Tape Output, twist (or pull) the red E-Stop/On button on the taping machine to start it.*

To remove all devices that are currently in programmers:

Click Clear on the Run window. All devices will be removed from the programming sockets and placed in the reject container.

Ending a Job

To end a job prior to programming the preset number of devices, click Finish on the Run Window. This completes the current programming cycle. No more blank devices are picked from the input media, and all devices in the sockets are removed and placed in the appropriate output or reject container.

The job can be resumed by selecting it again in TaskLink and clicking Run. CH700 SW will continue the job where it left off (when Finish was clicked).



Empty the reject bin whenever it looks full; there is no 'Full' indicator.

NOTE: It is NOT necessary to restart programmers between jobs.

Empty the reject bin or tray after ending a job.

Light Tower Interpretation

During operation of the PSV5000 System, you can monitor the light tower to reduce system down time. The light tower displays the following conditions:

Light	Condition	Action Required	Possible Causes	Machine Status
Red 	Operation is stopped due to major error or operator action	Operator intervention is mandatory to continue. It is likely that tools and troubleshooting skills will be required to resolve issues.	<ul style="list-style-type: none"> • Safety or access door is open • E-Stop is pushed • Actuator error • Gantry collision • Insufficient air pressure; • Laser not ready • Motion Control System error • Socket opener sensor error • Software exception • Vacuum sensor malfunction 	Stopped
Yellow/Red (alternating) 	Operation is stopped due to error or operator action	Operator intervention is mandatory to continue. Correction may be through Handler Computer software (CH700) or through minor hardware adjustment.	<ul style="list-style-type: none"> • File read/write error • Laser error • No programmer can be used • PNP error • Serialization errors • Setup related errors • Tape input error • Unprogrammed devices on Input/Pass tray 	Stopped
Yellow 	Operation is stopped intentionally	Operator intervention is mandatory.	<ul style="list-style-type: none"> • Output media is full or input media is empty. • The main Start button has been clicked (the Setup window is displayed) but no job is running. 	Stopped
Yellow/Green (alternating) 	Running below optimum or job is ended	Operator intervention is suggested.	<ul style="list-style-type: none"> • End of job • Some sockets are disabled • Vacuum errors are present on some programmers 	Processing or Stopped (end of job)

Light	Condition	Action Required	Possible Causes	Machine Status
Green 	Running normally	No operator action needed.	<ul style="list-style-type: none"> Processing devices, or clearing sockets to output. 	Processing

Changing Programmer Status

PSV5000 may automatically disable a programmer for various reasons (for example, if there are repeated continuity errors or vacuum issues). The operator may also choose to disable a programmer, or otherwise change the status of a programmer.

Disabling Programmers



The programmer status menu is shown in Figure 73: 73.

If programmers are not performing and the error cannot be cleared, disable those programmers and continue to use the other sites to process devices.

To disable a programmer:

1. At the Run window, click Pause.
2. Right-click on the target programmer and select All => DISABLED. All sockets on this programmer change to black and are effectively disabled.

NOTE: To disable a single socket, right-click the socket and select => DISABLED. The socket changes to black and is disabled.

To resume a job click Run. When the job finishes, click Clear or manually remove any devices from the disabled programmer sockets.

Clearing a Disabled Status

If a programmer is disabled (the PNP head skips it) it may be re-enabled if there are no devices in it as follows:

1. At the Run window, click Pause.
2. Right-click on the target programmer and select All => EMPTY. This DOES NOT REMOVE DEVICES FROM THE SOCKETS, only changes the status.

NOTE: To re-enable a single, empty socket, right-click the socket and select => EMPTY. This DOES NOT REMOVE DEVICES FROM THE SOCKET, only changes the status.

All sockets on this programmer change to grey and are re-enabled UNLESS THEY WERE NOT EMPTY.

3. To resume a job click Run.



An optional method of changing programmer and socket status is with the Programmer Interface window. (Setup window > System > Programmers) See the on-screen Help for more information.



This right-click procedure allows changes to one socket or one programmer, while the Clear button on the Run window clears all sockets on the all programmers in use.

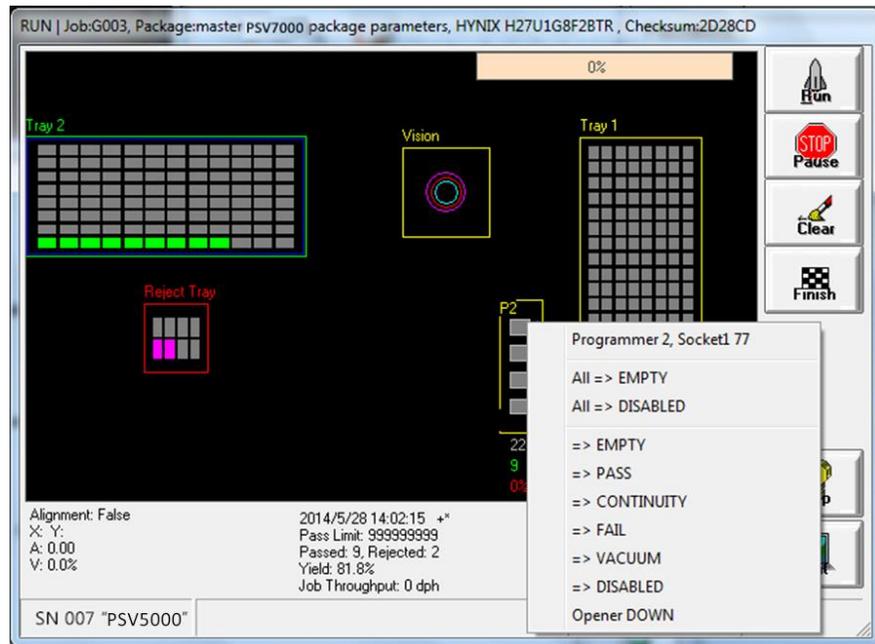


Figure 73: Right-click a programmer in the RUN window to change the status of the programmer, toggle the vacuum, or perform various other functions. NOTE that “All => EMPTY” and “=>EMPTY” only change the status and do not empty the socket(s).

My Jobs that Use the Same Setup

Use this chart to manage your programming jobs (ex. reusing existing jobs).

Unique Job Name	Uses : • Programmer Type • Socket Adapter • Atuator Plate	Works with . . .		
		Input . . .	Output . . .	Options . . .
	<ul style="list-style-type: none"> • _____ • _____ • _____ 	<input type="checkbox"/> Tape <input type="checkbox"/> Tray <input type="checkbox"/> Tube	<input type="checkbox"/> Tape <input type="checkbox"/> Tray <input type="checkbox"/> Tube	<input type="checkbox"/> Laser Mark <input type="checkbox"/> 3D Inspect VX <input type="checkbox"/> 3D Inspect UX <input type="checkbox"/> Reject Type _____
	<ul style="list-style-type: none"> • _____ • _____ • _____ 	<input type="checkbox"/> Tape <input type="checkbox"/> Tray <input type="checkbox"/> Tube	<input type="checkbox"/> Tape <input type="checkbox"/> Tray <input type="checkbox"/> Tube	<input type="checkbox"/> Laser Mark <input type="checkbox"/> 3D Inspect VX <input type="checkbox"/> 3D Inspect UX <input type="checkbox"/> Reject Type _____
	<ul style="list-style-type: none"> • _____ • _____ • _____ 	<input type="checkbox"/> Tape <input type="checkbox"/> Tray <input type="checkbox"/> Tube	<input type="checkbox"/> Tape <input type="checkbox"/> Tray <input type="checkbox"/> Tube	<input type="checkbox"/> Laser Mark <input type="checkbox"/> 3D Inspect VX <input type="checkbox"/> 3D Inspect UX <input type="checkbox"/> Reject Type _____
	<ul style="list-style-type: none"> • _____ • _____ • _____ 	<input type="checkbox"/> Tape <input type="checkbox"/> Tray <input type="checkbox"/> Tube	<input type="checkbox"/> Tape <input type="checkbox"/> Tray <input type="checkbox"/> Tube	<input type="checkbox"/> Laser Mark <input type="checkbox"/> 3D Inspect VX <input type="checkbox"/> 3D Inspect UX <input type="checkbox"/> Reject Type _____
	<ul style="list-style-type: none"> • _____ • _____ • _____ 	<input type="checkbox"/> Tape <input type="checkbox"/> Tray <input type="checkbox"/> Tube	<input type="checkbox"/> Tape <input type="checkbox"/> Tray <input type="checkbox"/> Tube	<input type="checkbox"/> Laser Mark <input type="checkbox"/> 3D Inspect VX <input type="checkbox"/> 3D Inspect UX <input type="checkbox"/> Reject Type _____
	<ul style="list-style-type: none"> • _____ • _____ • _____ 	<input type="checkbox"/> Tape <input type="checkbox"/> Tray <input type="checkbox"/> Tube	<input type="checkbox"/> Tape <input type="checkbox"/> Tray <input type="checkbox"/> Tube	<input type="checkbox"/> Laser Mark <input type="checkbox"/> 3D Inspect VX <input type="checkbox"/> 3D Inspect UX <input type="checkbox"/> Reject Type _____
	<ul style="list-style-type: none"> • _____ • _____ • _____ 	<input type="checkbox"/> Tape <input type="checkbox"/> Tray <input type="checkbox"/> Tube	<input type="checkbox"/> Tape <input type="checkbox"/> Tray <input type="checkbox"/> Tube	<input type="checkbox"/> Laser Mark <input type="checkbox"/> 3D Inspect VX <input type="checkbox"/> 3D Inspect UX <input type="checkbox"/> Reject Type _____

Unique Job Name	Uses : • Programmer Type • Socket Adapter • Atuator Plate	Works with . . .		
		Input . . .	Output . . .	Options . . .
	<ul style="list-style-type: none"> • _____ • _____ • _____ 	<input type="checkbox"/> Tape <input type="checkbox"/> Tray <input type="checkbox"/> Tube	<input type="checkbox"/> Tape <input type="checkbox"/> Tray <input type="checkbox"/> Tube	<input type="checkbox"/> Laser Mark <input type="checkbox"/> 3D Inspect VX <input type="checkbox"/> 3D Inspect UX <input type="checkbox"/> Reject Type _____
	<ul style="list-style-type: none"> • _____ • _____ • _____ 	<input type="checkbox"/> Tape <input type="checkbox"/> Tray <input type="checkbox"/> Tube	<input type="checkbox"/> Tape <input type="checkbox"/> Tray <input type="checkbox"/> Tube	<input type="checkbox"/> Laser Mark <input type="checkbox"/> 3D Inspect VX <input type="checkbox"/> 3D Inspect UX <input type="checkbox"/> Reject Type _____
	<ul style="list-style-type: none"> • _____ • _____ • _____ 	<input type="checkbox"/> Tape <input type="checkbox"/> Tray <input type="checkbox"/> Tube	<input type="checkbox"/> Tape <input type="checkbox"/> Tray <input type="checkbox"/> Tube	<input type="checkbox"/> Laser Mark <input type="checkbox"/> 3D Inspect VX <input type="checkbox"/> 3D Inspect UX <input type="checkbox"/> Reject Type _____
	<ul style="list-style-type: none"> • _____ • _____ • _____ 	<input type="checkbox"/> Tape <input type="checkbox"/> Tray <input type="checkbox"/> Tube	<input type="checkbox"/> Tape <input type="checkbox"/> Tray <input type="checkbox"/> Tube	<input type="checkbox"/> Laser Mark <input type="checkbox"/> 3D Inspect VX <input type="checkbox"/> 3D Inspect UX <input type="checkbox"/> Reject Type _____

Finishing a Job

After a job completes:

1. Wait for the PNP head to park.
2. (Optional) If Sort-On-Error-Code was employed, record the number of devices in Reject 1, (FailBox1).
3. Empty the reject container(s).
4. Remove programmed devices.

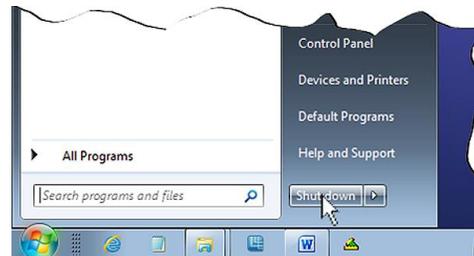
Turning PSV5000 System Power OFF

When the PSV5000 System will not be run overnight, or before performing a service procedure, turn OFF the power.

1. Finish or end the job if one is running.
2. Remove all devices from the workspace.

CAUTION:  ***Possible damage to programmers and devices! DO NOT TURN POWER OFF to the programmers or to the PSV5000 Machine while a job is running. A job must be Finished before turning programmer power OFF. Wait for the gantry to park before turning machine power OFF.***

3. At the Handler PC:
exit CH700 and TaskLink,
and **TURN OFF THE
HANDLER COMPUTER
WITH THE WINDOWS
Start MENU.**



CAUTION:  ***Possible loss of data or difficult restart! DO NOT TURN PSV5000 POWER OFF before shutting down the Handler PC. Ensure the monitor is dark (and not just asleep) and any optional PCs are shut OFF prior to cutting power to the PSV5000 Machine.***



4. **[Laser Marker System only]**
 - a. (Optional) Save and exit the Laser Marker software.
 - b. Push the RED LIGHT switch OFF [0].

- c. Turn the Key-switch OFF (counterclockwise).



Figure 74: Laser Control Panel

- d. WAIT UNTIL WINDOWS COMPLETES SHUTTING DOWN, and then rotate the main power switch (on the PSV5000 Power Panel) OFF (counterclockwise).
- e. (Optional) Padlock the main power switch so that it cannot be turned back ON while the lock is in place.

Basic Tray Feeder Operation



For Tray Feeder installation on PSV5000, see Chapter 2 of the PSV5000 Owner's Manual.

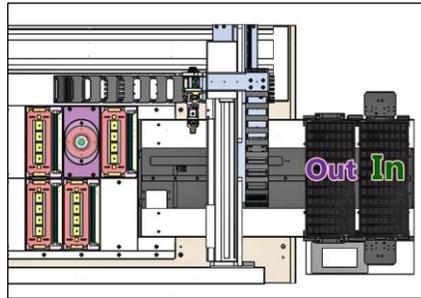
For Tray Feeder specifications, setup, and troubleshooting, see the **Tray Feeder Owner's Manual**.

To start the Single Tray Feeder:

1. Ensure the Tray Feeder utilities are plugged into the PSV5000 Machine and the Tray Feeder power switch is in the ON position.

NOTE: *The Tray Feeder will power up when the PSV5000 Machine is started.*

2. Prior to clicking Start in CH700, install up to 20 JEDEC trays of un-programmed devices into the *Input Stack* of the Tray Feeder.



3. Start a PSV5000 job through TaskLink. Tray Feeder loads the first tray.
4. In CH700, click Start. The Tray Feeder initializes.
5. At the Setup > Options tab select the tray options desired.
6. When *Setup* options are set, ensure that the machine workspace matches the settings. Rectify differences.
7. Click Run. A password may be required.

NOTE: *The Tray Feeder can be reloaded with trays at any time, and output trays removed. However, opening the Tray Feeder door will stop any tray movement until it is closed again.*

It does not stop PSV5000 operation unless a tray exchange is required while the Tray Feeder door is open.

If You Have Trouble

If programmer trouble occurs you should collect system log files.

Collecting System Logs

Collect Logs is a software utility within CH700 Software that collects all log files from the Data I/O Automated Programming System. It creates a ZIP file containing all the information that Data I/O trained service technicians need to evaluate your machine status.

There are several ways to start the *Collect Logs* utility:

- If CH700 creates an error message on the monitor, it offers a Collect Logs button.
- In CH700, navigate to the System window and click Collect Logs.
- Click Windows Start button > [All Programs] > Dataio > CollectLogs.

Programmer Related Problems

When you experience a programmer related problem:

1. Force the error to re-appear by running a job, or performing the same steps that led to the trouble.
2. Close all Data I/O software such as TaskLink, CH700. (Close CH700 the usual way: click Finish to stop a job, Exit the Run Window, Exit the program.)
3. Start *Collect PSV5000 Logs* by clicking the windows Start button > Dataio > CollectLogs.
4. (Optional) In Collect PSV5000 Logs, click Add Description.
5. In Collect PSV5000 Logs, click Collect and ZIP and save the ZIP file to a desired folder.
6. To send to Data I/O Support,
 - a. If your system doesn't have Internet connection, copy the ZIP file to a USB Flash Drive.
 - b. At the machine or a PC with Internet connection, open a browser and navigate to **www.Dataio.com** and click Technical Support.
 - c. Fill out the support for form; click **Browse** to locate the ZIP file.
 - d. Click Submit.

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Technical Support

World Wide

Data I/O Corporation
Redmond, WA USA 98052

Telephone: inside US
1-800-332-8246
USA Fax: +1 425-867-6972



Contact Data I/O World Wide Support or your local representative. To find your local representative on our Web site, go to <http://www.dataio.com> and click Contact Sales (upper right), and then Representative Search. Then follow the instructions.

The best way to get support is logging into our online Support Portal. Go to the website and click the Technical Support button or the Contact Sales button.

Germany

www.dataio.de

China

www.dataio.cn

USA and all others

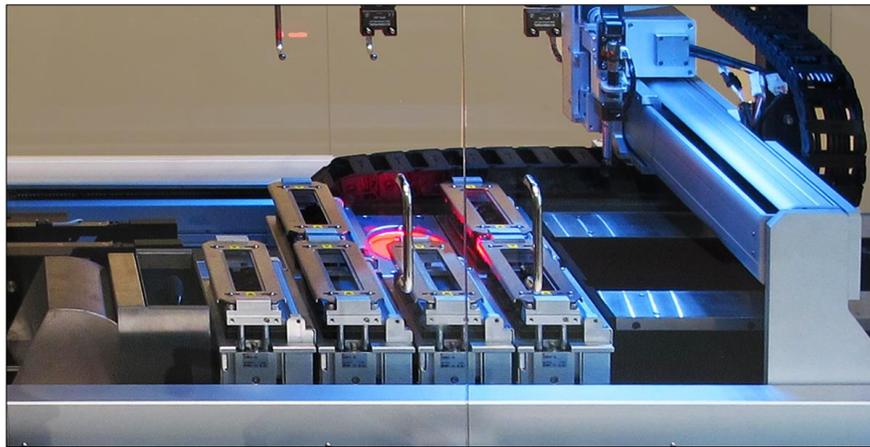
www.dataio.com

For quick accurate support, please provide the following information:

- PSV5000 Serial number (at the Power Panel)
- Software Version (lower right corner of CH700)
- Tray Feeder Serial Number (if Tray Feeder related)
- Detailed description of the problem you are experiencing (if any)
- Error messages (if any)
- Device manufacturer, device part number, package style and number of pins (if device related)
- Name, telephone number, address, and e-mail address

Check the Technical Library on our website for occasional updates to this manual.

Programmable Media Experts



Data iO

www.dataio.com
www.dataio.de
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